

*June 2021*

# Review of the Health Systems Research Initiative

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**Final report**

Anoushka Davé, Maike Rentel, Eva Wölbart, Robert King, Rebecca Babb, Kalle Nielsen, Peter Varnai



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# Table of Contents

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1	Introduction	1
1.2	The case for intervention	1
1.3	The Health Systems Research Initiative	3
2	Methodology	7
3	Theory of change and indicator framework	9
3.1	HSRI Theory of change	9
3.2	Indicator framework	11
4	Impact evaluation of the HSRI	15
4.1	Inputs and activities – The HSRI Portfolio	15
4.2	Stakeholder engagement	22
4.3	Challenges	23
4.4	Outputs	25
4.5	Outcomes	31
4.6	Impacts	39
4.7	Impact case studies – summaries	41
4.8	Value for money	52
5	HSRI and the Global Health Research Landscape	55
5.1	Development of the field of health systems research	55
5.2	HPSR funding – organisations and programmes	56
5.3	Funding programmes relevant to HPSR	57
5.4	Impact indicator frameworks and monitoring processes employed for HPSR	60
5.5	HSRI in the global funding landscape	62
5.6	Gaps in the HPSR funding landscape	64
6	HSRI design and management	65
6.1	The design of the HSRI	65
6.2	The review process	68
6.3	Project monitoring & evaluation	68
6.4	Additional activities to improve impact	69
7	Conclusions and recommendations	70
7.1	Conclusions	70
7.2	Recommendations	71



# Tables

---

Table 1 Areas addressed within health systems building blocks	2
Table 2 Selection criteria for full research grants (call 7)	6
Table 3 HSRI indicator framework	12
Table 4 Number of HSRI grants (Call 1 - 6), by status	15
Table 5 Number of publications by publication type, grant type and grant status	25
Table 6 Top 10 journals with the most publications	26
Table 7 Number of further funding grants by type of HSRI award	32
Table 8 Organisations that provided additional funding to HSRI awards	33
Table 9 Enablers and barriers	39
Table 10 Overview of impact case studies	42
Table 11 Overview of HPSR research programmes	58
Table 12 Monitoring and indicators of HPSR programmes	60
Table 13 Strengths and weaknesses of the HSRI according to funded researchers	63

# Figures

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Figure 1 Committed funding by funder	5
Figure 2 Theory of Change for the Health Systems Research Initiative	10
Figure 3 Number of HSRI grants by call and grant type	16
Figure 4 Total amount awarded (in £ million), per call and grant type	16
Figure 5 Average grant size per call and grant type	17
Figure 6 Number of grants by institution, for institutions that received 2 or more grants	18
Figure 7 HSRI research locations (n=92)	19
Figure 8 Share of HRCS research activity code classification, by grant type	20
Figure 9 Share of HRCS health code classification, by grant type	20
Figure 10 Expertise included in the project (n=27)	21
Figure 11 Stakeholder engagement during the design and implementation phases (n=27)	22
Figure 12 Mode of stakeholder engagement (n=24)	23
Figure 13 Main challenges reported by PIs (n=23)	23
Figure 14 Adjustments made to the study (n=16)	24
Figure 15 Formal training for staff and stakeholders (n=25)	28
Figure 16 Capacity development for LMIC (a) and HIC (b) researchers and institutions	28
Figure 17 Level of involvement of Co-I in design of project by Co-I institution location (LMIC, n=71; HIC, n=27)	29



Figure 18	Influence of HSRI projects on the work of co-investigators and their research institutes (n=98)	30
Figure 19	Proportion of successful applications led by LMIC-based PIs, by call	30
Figure 20	Capacity development for LMIC decision makers, practitioners and community representatives	31
Figure 21	New research collaborations	34
Figure 22	Collaborative activity beyond the HSRI project (n=21)	34
Figure 23	New stakeholder collaborations	35
Figure 24	Number of applications per call	35
Figure 25	Wider impacts of HSRI awards (n=26)	40
Figure 26	Donors of health policy and systems research funding >USD100 million (2000-2014), in USD million	56
Figure 27	Top 10 bilateral donors of health policy and systems research funding (2000-2014), in USD million	56

# 1 Introduction

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## 1.1.1 This report

Technopolis Ltd was commissioned to conduct an independent, external review of the Health Systems Research Initiative (HSRI) by the HSRI funders (UK Foreign, Commonwealth and Development Office [FCDO], the Medical Research Council [MRC], the Economic and Social Research Council [ESRC] and the Wellcome Trust) to understand the impact of the programme, its potential for future impact, and inform the design of future funding programmes. The review was to gather evidence relating to awards made in Calls 1-6 of the HSRI (2014 to 2019) and was carried out between July 2020 and April 2021. This report lays out the main findings from the review and the study team's recommendations for future funding calls.

The review had four main objectives.

- To provide information on whether and how the programme delivers on its core aim of generating high quality, internationally competitive research which addresses key questions on strengthening and improving health systems in low- and middle-income countries (LMICs)
- To investigate whether there are outcomes and impacts from research funded by the programme; to explore and describe what barriers and facilitators there are to achieving impact, and how future impact can be maximised
- To provide the funders with case studies representative of the work funded under the programme that can be used to demonstrate the range of outcomes and impact
- To provide guidance to the funders on future monitoring, evaluation and learning for the programme.

In addition, the funders requested a review and update of the Theory of Change (TOC) for the programme

Further, the specification for the review set out a range of research questions to be addressed, falling into six categories:

1. Location and role of the HSRI in the research landscape
2. Research funding through the programme
3. Scientific outcomes
4. Programme impact
5. Programme management and evaluation
6. Value for money (VfM)

## 1.2 The case for intervention

Inadequacies in health systems limit health outcomes for populations in LMICs. An estimated 15.6 million excess deaths occurred in LMICs in 2016, with around 7 million deaths preventable through public health intervention and 8.6 million deaths due to a lack of access to high-quality care, across a broad range of conditions. The latter includes around 3.6 million people who did not access the health system (non-utilisation), and 5.0 million who did but received poor-quality care (Kruk, Gage, Joseph, *et al.*, 2018).

Arguments for a shift of research funding (at least to some degree) from the development of new interventions towards research on the delivery and use of health technologies include:

- Effective technologies often exist, but do not meet their full potential in improving health outcomes. Issues are often rooted in 'non-medical' areas, such as logistics, deployment of personnel, and integration of interventions into existing health services (Leroy *et al.*, 2007).

Furthermore, new technologies are likely to encounter the same barriers that prevented current ones from achieving their potential.

- There is evidence that countries with similar levels of economic development have substantially different levels of health. Health outcomes are affected by issues and bottlenecks within the health system; these can involve one or more components of the system.
- Interventions that strengthen health systems produce substantial positive effects on health status and health system outcomes (Hatt *et al.*, 2015). Research on health systems can thus provide insights and guidance underpinning interventions

### 1.2.1 Definition of health systems research

Health systems research, health services research, as well as the related fields of implementation research and operational research, have been defined in multiple ways, often resulting in considerable overlap between definitions (Remme *et al.*, 2010; Mills, 2012). The inconsistent use of terminology to describe the research is at least in part due to the range of disciplines involved and the relatively recent shift in focus towards this field of research.

The Alliance for Health Policy and Systems Research (AHPSR), a partnership hosted by the World Health Organisation (WHO), employs the term 'Health Policy and Systems Research' (HPSR). It defines HPSR's goal as "*the purposeful generation of knowledge that enables societies to organise themselves to improve health outcomes and health services*" (WHO, 2009). HPSR thus provides "*crucial evidence to inform health-related policy and support the efficient and successful implementation of health interventions*", including an understanding of "*how different actors interact in the policy and implementation processes to contribute to policy outcomes*"<sup>1</sup>. Policy was included by the AHPSR's to include the goal of influencing policy explicitly within the remit of health systems research.

Health systems are complex systems. WHO describes health systems in terms of six core components or "building blocks": 1) service delivery, 2) health workforce, 3) health information systems, 4) access to essential medicines, 5) financing, and 6) leadership/governance (Table 1) (World Health Organization, 2010). These blocks contribute to the strengthening of health systems in different ways: Some are cross-cutting components, such as leadership/governance and health information systems, on which the overall policy and regulation of all the other health system blocks are based. Others refer to key inputs to the health system, such as financing and the health workforce. HPSR can address any or several of these six building blocks. Given the broad range of (inter-related) components that 'build health systems', and the variety of actors within, HPSR is inherently multi- and interdisciplinary, drawing upon a range of disciplines, particularly social sciences including economics, sociology, anthropology, political science, psychology, management science, geography and history, as well as epidemiology (Alliance for Health Policy and Systems Research, 2007).

*Table 1 Areas addressed within health systems building blocks*

	<b>Building block</b>	<b>Areas / research topics</b>
1	Service delivery	Access, integrated care, continuum of care and modes of delivery Non-state sector (e.g. contracting, private sector) Quality of care and performance
2	Health workforce	Distribution and retention Training (pre-service and in-service) Migration

<sup>1</sup> <https://healthsystemsglobal.org/improving-health-systems/what-is-hpsr/>

3	Health information systems	Medical and drug records; computerised records Management information systems	
4	Medicines	Monitoring (e.g. adverse reactions) Selection (e.g. in essential drug lists) Regulation and Quality Assurance Intellectual Property Access Policy/Reform (e.g. national drug policies)	Insurance and Financing Medicine supply (e.g. forecasting) Prescribing and utilisation Information (e.g. for education and advocacy) Marketing (e.g. drug promotion)
5	Health financing	Payment mechanisms Health insurance Resource allocation	
6	Governance and leadership	Government regulation and legislation Licensing and accreditation Professional authority and roles (e.g. scope, content and location of practice) Audit Consumer involvement	

Source: Reproduced from (Adam et al., 2011)

### 1.3 The Health Systems Research Initiative

#### 1.3.1 History of the programme

The HSRI was established in 2013 as a joint funding programme by the UK Department for International Development (DFID, now FCDO), the MRC, ESRC and Wellcome Trust. All four HSRI funders are invested in improving population health in LMICs and three of the funders (except ESRC) have been working together to deliver another funding programme called the Joint Global Health Trials Initiative (JGHTI).

The HSRI funders agreed that a dedicated programme of research to elucidate how best to strengthen health systems in different contexts and how to effectively implement evidence-based interventions was needed. Working together in a joint programme not only provides critical mass to set up a high-profile funding programme in a new area, but it also benefits from the complementary expertise and infrastructure of the different funders. This is particularly relevant in this context because health systems research lies at the intersection of multiple disciplines. Moreover, by working together, the funders are able to pool resources (making more funds available for the programme), share the risk of some of the funded research projects failing to lead to the envisioned impacts, and streamline application and administration processes for both funders and applicants.

A challenge at the start of the programme was lack of clarity about the scope and nature of the field of health systems research, and how it relates to health services research. The funders adopted a broad, question-driven definition from the WHO<sup>2</sup> for health systems research as “the purposeful generation of knowledge that enables societies to organise themselves to improve health outcomes and health services”. The intention was to include a wide range of research, from operational research and implementation research to broader health systems research.

Development of the HSRI became concrete in 2011, with a consultative workshop on opportunities in health systems research. The workshop was jointly held by the four funders and the UK Collaborative on Development Science. Participants included key representatives from the international research community, health policy making institutions, health care practitioners, civil society, the pharmaceutical industry, and public and private health care

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<sup>2</sup> Mark Palmer (2012) MRC Global Health Portfolio. Background paper for the Global Health Group

providers. The following themes emerged as global priorities for the UK to focus its funding resources during the workshop<sup>3</sup>

- Implementation research
- Health policy and systems research capacity
- Promotion of evidence-informed policy making

### 1.3.2 Aims of the programme and scope of calls

The overall aim of the programme is to generate world class and cutting-edge research that addresses key questions on strengthening and improving health systems in LMICs. As such, its objective is to fund methodologically rigorous, high quality research that will:

1. Generate evidence on how to strengthen health systems in LMICs
2. Use a health systems approach to inform the delivery of evidence-based interventions or health system reforms
3. Provide evidence that is of direct relevance to decision makers and practitioners in the field
4. Engender capacity development in HPSR amongst both research users and producers of evidence

The focus of the programme and applications has been continuously reviewed. Many of the early applications were too specific in scope and lacked health systems thinking. This has changed over the years and the majority of applications received are now clearly relevant to strengthening health systems<sup>4</sup>. Applicants are also encouraged to submit interdisciplinary proposals and to use innovative methodologies.

Following feedback from the funding committee, from Call 3 onwards more emphasis has been placed on integrating some degree of capacity development into projects. Although the funders agree that social science plays an important role in the initiative, the quality of social science research in the applications received has been low over several years and changes to the call text (courtesy ESRC expertise) have unfortunately not led to a stronger social science response thus far.

The committee also emphasised the importance of the research being embedded into the local context, ideally through locally based principal investigators (PIs) or co-PIs. The eligibility criteria allow PIs to be based in an LMIC or in the UK (with a clear partnership with LMIC researchers).

The calls accommodate two types of proposals.

1. Foundation grants for 1-2 years with budgets usually up to £200k. The purpose of these is to lay the foundations for more substantial research studies, particularly to assist interdisciplinary teams develop robust, competitive proposals, or for exploratory research<sup>5</sup>
2. Full scale research projects for 3-5 years duration

### 1.3.3 Outline of the investment to date

The funders have committed a total of £39.7 million towards the HSRI in two rounds: £15 million for the first three funding rounds (2014, 2015, 2016), and £24.6 million for the following five funding rounds (2017, 2018, 2019, 2020, 2021). Funders are currently considering whether to

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<sup>3</sup> Report of the DFID, ESRC, MRC, the Wellcome Trust and UKCDS workshop: 13th and 14th December 2011, <https://www.ukcdr.org.uk/wp-content/uploads/2018/03/Health-system-research-workshop-report-June-20122.pdf>

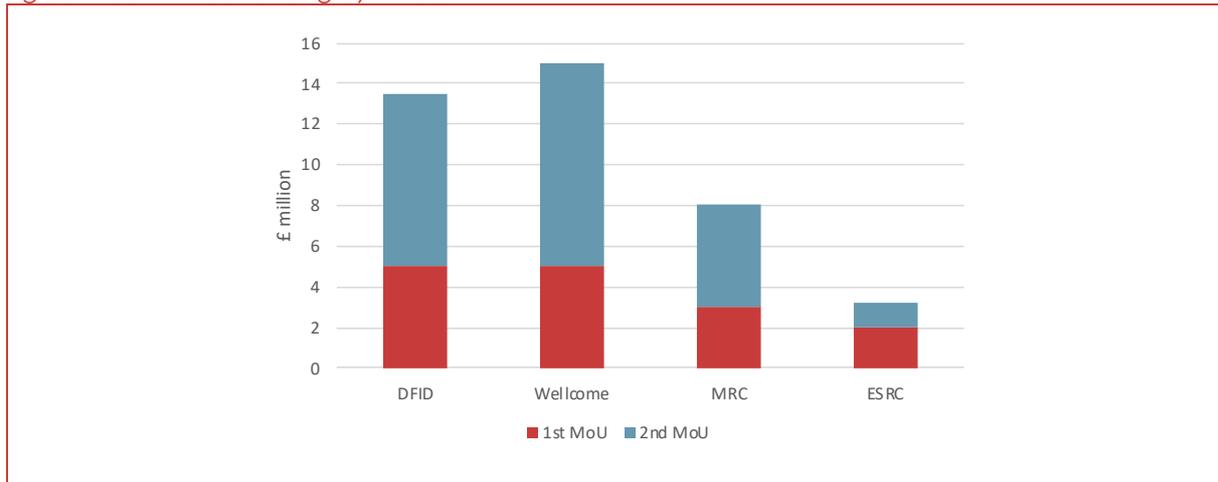
<sup>4</sup> 2016 Joint Health Systems Research Initiative committee feedback

<sup>5</sup> The scope was less exploratory in the initial calls, instead focussing on exploring innovations or approaches that have potential for further development and represent practical solutions for strengthening health systems. Recent calls have been worded to allow more exploratory research to encourage more social science.

continue supporting the programme beyond 2021. From call 6 onwards, ESRC has ceased financial contributions and is unlikely to contribute in the future. This decision was made to allow ESRC to focus on activities more aligned with its remit. Nonetheless, beyond Call 6 ESRC continues to contribute in-kind in terms of advice on the social sciences component of the programme.

The memorandum of understanding (MoU) between the funders for the first three rounds of funding set out the individual funder contributions as £5 million each from DFID and Wellcome, £3 million from MRC and £2 million from ESRC. In the second MoU, DFID committed £8.5 million, MRC £5 million, Wellcome £10 million, and ESRC £1.16 million (see Figure 1).

Figure 1 Committed funding by funder



Source: HSRI Memoranda of Understanding

### 1.3.4 Programme management

HSRI has benefitted from the experience of setting up and running the JGHTI, a joint global health programme that involves many of the HSRI funders. This prior experience enabled a relatively quicker and smoother launch of the programme and allowed the funders to replicate management structures and processes that had already been proven to work well.

The HSRI is jointly overseen by all funders through a joint Project Management Group (Funders committee), with advice from the MRC Global Health Group (now replaced by the Applied Global Health Research Board). Administration of the programme is undertaken by Wellcome and MRC. Wellcome's role is to manage, convene and remunerate the funding committee. MRC is responsible for issuing the call for proposals, processing applications, external peer-review as well as post-award management and outcomes monitoring through Researchfish®. MRC also handles payments to grantees and accordingly receives funds from the other funders. While initially anticipated that no management fees would be charged to the programme budget, an amendment to the MoU from December 2015 allows the use of DFID funds to cover an agreed amount of MRC's management costs.

### 1.3.5 The selection process

Applications for funding are considered by a funding committee which meets twice per year, once to review outline proposals for full research grants, and once to make funding decisions about full research grants and foundation grants. The funding processes for the two types of grants differ.

- The selection process for foundation grants is a 1-stage process without peer-review. Foundation grants do not necessarily proceed to full grants; researchers can apply for full grants through the normal process following completion of their foundation grant

- Applications for full grants undergo a 2-stage assessment process. At the outline stage, proposals are reviewed by the committee, who will invite a selection of the applicants to submit a full proposal. The committee also provides feedback to successful applicants to guide the development of the full grant proposal. Full grant proposals are sent for external peer review, and applicants have an opportunity to reply to peer reviewers' comments

The funding committee then assesses applications to arrive at a final decision on fundability and ranking, using a set of defined criteria (see Table 2). The process foresees a discussion by three lead reviewers, followed by scoring from all panel members.

The funding committee is currently composed of 16 members who cover the breadth of subject matter expertise needed to make decisions regarding the applications. While Wellcome is responsible for convening the committee, the other funders may suggest members to cover their own specific area of expertise e.g. ESRC recommends members with relevant social science expertise.

*Table 2 Selection criteria for full research grants (call 7)*

<b>Criteria</b>	<b>Description</b>
Research quality	How novel and timely is the research? Is the research well justified, based on engagement with body of existing literature?
Impact	Is the research likely to deliver evidence of direct relevance to decision makers? Does the research take a health systems approach? Is the pathway to impact and scalability well considered?
Research management and people	Is the investigator group well-placed to deliver the proposed research? Is there a link with local institutions and involvement of investigators from other countries? Has capacity building been embedded into the research plan?
Methodology	Is the design of the study feasible and appropriate to answer the question? Is the timeline realistic and achievable? Has the methodology been underpinned by a relevant theoretical or conceptual framework?
Ethics	Is the research ethically acceptable? Are there any governance issues?
Data management plan	Is there is a sound plan for managing the research data, taking into account the types, scale and complexity of data being (or to be) managed and also the likely long-term value for further research including by sharing data.
Resources requested	Is the proposal good value for money? Are the funds requested well justified?

The final decision on grant awards is made by the funders, with final sign-off required from each funder. The funding committee's ranking is usually accepted when making the awards. However, depending on the funds available and strength of the applications received, not all fundable applications will be funded.

## 2 Methodology

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The review employed a mix-methods approach, involving multiple strands of data collection and analysis which cut across the review questions.

- **Scoping exercise**

The study started out with a scoping exercise, to allow orientation in relation to the key strategies and parameters of the HSRI, and refinement of the theory of change and monitoring framework. This phase consisted of an initial meeting between Technopolis and the HSRI funders, a review of HSRI documentation, and scoping interviews with the HSRI funders (4 interviews in total).

- **Document review and desk research**

*Portfolio analysis:* Information for the portfolio analysis was provided by the funders, including data on both funded and rejected proposals (latter anonymised). An analysis of the MeSH headings associated with applications was also conducted. An extended portfolio analysis is available in Appendix A.

*Funding landscape review:* A review of the funding landscape was conducted. This involved a literature review and identification of relevant funders and programmes through targeted online searches. Extended information is available in Appendices C and D.

- **Database analysis**

*Analysis of Researchfish® data:* 75 of the 92 awards (40 closed, 35 active) had submitted entries to Researchfish® in 2020. Of these 75 awards, 47 were foundation awards and 28 full awards. The data for the following categories were analysed: Publications, Further funding, Skills, Dissemination, Policy, Tools, Databases, Software, Artistic products, IP and Products. Where necessary, duplicate entries and outliers were excluded from the analysis. An extended analysis is available in Appendix A.

*Bibliometric analysis:* Citation numbers for 161 publications attributed to HSRI grants in Researchfish® were extracted from the Scopus database. Only those publications with a valid DOI and that were published by the end of 2019 were included as publications from 2020 have not had enough time to accrue citations.

- **Primary data collection: Surveys and interviews**

*Survey of PIs, co-investigators and unsuccessful applicants:* Three surveys were developed to gather information from: 1) PIs who were not invited to interview; 2) co-investigators (Co-Is) of all awards, and 3) a subset of unsuccessful applicants. The surveys were implemented using an online survey tool, SurveyMonkey. Full questionnaires are available in Appendix E.

The study team sent the PI and Co-I survey to contacts contained within the HSRI grants database (50 PIs; 351 co-investigators). E-mail addresses where the survey invitation was 'undeliverable' were updated through online searches. The MRC distributed the survey to 130 unsuccessful applicants (to maintain anonymity of applicants) ensuring a balance across LMIC/UK applicants, scores and calls. The surveys remained open for 6 weeks, with non-respondents receiving up to 2 further reminders.

Responses were received from 27 PIs (10 development/foundation awards, 17 full awards; 12 from LMICs), 100 Co-Is (57 covering 33 development/foundation awards, 43 covering 22 full awards; 73 from LMICs), and 39 unsuccessful applicants (17 from LMICs). Extended survey analysis is available in Appendix B.

*Programme of interviews:* Three interview programmes were conducted, aimed at 1) PIs and project partners; and 2) other stakeholders.

- Interviews of PIs and partners: The objective of this interview programme was to gather information on project-related impact and experiences; for the case studies; and to inform the wider global health landscape review. PIs of both full and development/foundation awards were approached. PIs were prioritised for interview if their projects were closed, Researchfish® analysis hinted at impact, and if they had multiple awards. In total, 28 PIs were interviewed (15 full and 13 development/foundation awards<sup>6</sup>; 14 from LMIC institutions). Interviewed PIs were requested to facilitate contact with project partners for interview. We interviewed 5 Co-Is and researchers, 2 policy makers and 1 health care provider organisation.
- Interviews of key opinion leaders: The objective of this interview programme was to gather perceptions of the HSRI and its impact, views on the design and implementation of the scheme, and understanding of the wider landscape. A total of 12 key opinion leaders were interviewed including international funders (5), funding committee members (4), and HPSR experts (3).

- **Impact case study development**

HSRI-funded projects that had led to outcomes or impact in terms of policy, practice, and further research were identified from the information gathered in interviews and the survey, and selected for impact case studies. PIs were given the opportunity to verify the accuracy of the final case study. Case study summaries are presented in this report, with the full case studies available in Appendix F.

- **Analysis and recommendations**

Evidence gathered from multiple sources and perspectives, was used to triangulate and verify findings, and to formulate recommendations. The findings and recommendations were validated and critically assessed in a validation workshop with members of the HPSR community which included HSRI-funded PIs, HSRI funding committee members, independent HPSR experts and HPSR funders.

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<sup>6</sup> 8 closed full awards, 7 open full awards, 12 closed development/foundation awards, 1 open foundation award

## 3 Theory of change and indicator framework

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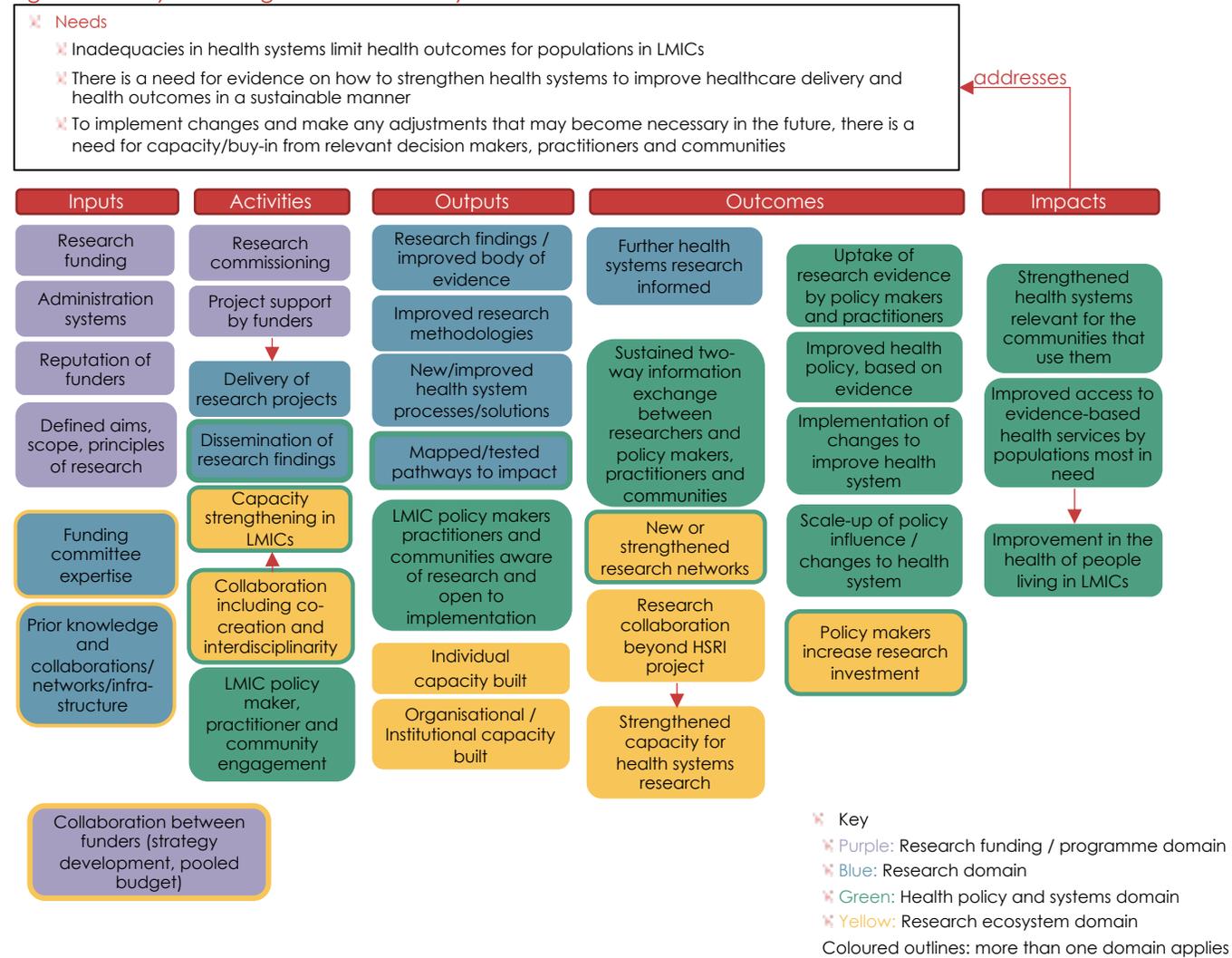
### 3.1 HSRI Theory of change

A TOC provides a structured approach to look at a programme or intervention. It is a theory of how and why an intervention works or is expected to work. It makes explicit the mechanisms underlying the intervention, i.e. the causal pathways of how the inputs (e.g. funders' budget, programme management) and the resulting activities (e.g. research projects, stakeholder engagement) are expected to produce immediate outputs (e.g. new evidence, skills and collaborations). These in turn are connected to medium-term outcomes (e.g. change in local practices) and longer-term outcomes (e.g. change in practices beyond the project site) and eventually the realisation of the desired objectives/impacts (e.g. improvement in health of target population, health system strengthening). A TOC can be visually represented in a TOC map, providing a graphic representation of the causal pathways within the context in which a programme is implemented.

Anticipated outputs, outcomes, and impacts can be linked to a set of indicators that evidence whether, and to what degree, the programme is progressing towards its intended impacts. Thus, a TOC provides a framework for monitoring, evaluation and learning throughout a programme cycle. A TOC is not meant to be a static framework, and should be revisited at regular intervals to incorporate learning derived from the programme.

In order to describe the intervention of the HSRI, we developed a TOC (Figure 2), tracing the causal chain of connections between the inputs, activities, outputs, outcomes, and impacts to achieve the stated objectives, which in turn reflect the needs within the HPSR landscape. This was informed by a review of the available policy documents setting out the rationale for the programme, interviews with the funders (scoping interviews) and a stakeholder workshop.

Figure 2 Theory of Change for the Health Systems Research Initiative





### 3.1.1 Assumptions

As we move from outputs to impacts in our TOC, the influence of external factors, i.e. contextual factors outside the HSRI, increases. When building causal pathways, we sometimes make use of assumptions based on experience that output A will lead to outcome B which in turn will lead to (or contribute to) impact C. Spelling out these assumptions highlights potential barriers and allows us to consider how 'risky' individual links are – and whether other interventions are needed to overcome potential barriers.

We examined assumptions underpinning our TOC for HSRI. These include the following:

- Assumptions related to research funding, research, and research ecosystem domains:
  - There is a sizeable research community in this field and the HSRI receives high quality fundable proposals
  - Equitable partnerships between UK and LMIC researchers and an increase in the number of bids from LMIC researchers and institutions will lead to increased research capacity, strengthening future research
  - Funding for HPSR will continue to be made available by the funders
  - Individual research projects provide sufficient evidence to inform a policy or systemic change
  - Policy changes and their impact can be viewed in the timescale of the programme
  
- Assumptions related to the health policy and systems domain:
  - The research is taking place in the context of an available window of opportunity for the uptake and implementation of its findings
  - Projects are engaging LMIC stakeholders with the agency to help the population in need, and an interest in addressing the issue the project relates to
  - Sufficient technical capacity and resources are available to implement the most effective interventions and health system reforms, including at scale
  - The political environment remains favourable and is receptive to evidence and change related to the health system, i.e. there is a culture of evidence-based policy making which places value on research evidence
  - Health system changes supported by the research findings are acceptable to practitioners and end users

### 3.2 Indicator framework

Alongside an update of the HSRI's theory of change, the funders requested an update of the indicator framework. To that end, the study team developed an indicator framework setting out indicators for the outputs, outcomes and impacts presented in the TOC (Table 3). Moreover, since the main objective of this review was to determine the outcomes and impacts achieved by HSRI-funded activities to date, the study team used the framework to guide the review. However, in the end not all the indicators could be populated as the required data or evidence were not available, particularly in the case of impact.

Table 3 HSRI indicator framework

Output/outcome/impact	Indicator
<i>Outputs</i>	
Research findings/improved body of evidence	<ul style="list-style-type: none"> <li>• Number of publications in peer-reviewed journals</li> <li>• Number and topic of approved policy briefs</li> <li>• Number and accessibility of databases</li> </ul>
New/improved health system processes/solutions	<ul style="list-style-type: none"> <li>• Number and type of new/improved health system processes/solutions</li> <li>• Number and type of tools/training materials/guidelines/implementation guides available</li> </ul>
Improved research methodologies	<ul style="list-style-type: none"> <li>• Number and type of new/improved methodologies</li> </ul>
Mapped/tested pathways to impact	<ul style="list-style-type: none"> <li>• Proportion of projects which have documented and/or tested pathways to impact</li> <li>• Evidence of implementable pathways to impact (qualitative/case study approach)</li> </ul>
LMIC policy makers, practitioners and communities aware of research and open to implementation	<ul style="list-style-type: none"> <li>• Proportion of projects involving policy makers, practitioners and community representatives</li> <li>• Number of instances of training or advising policy makers or practitioners; nature of training or advice (qualitative)</li> <li>• Evidence of LMIC policy makers, practitioners and communities feeling more informed of the nature and value of research (qualitative/case study approach)</li> <li>• Evidence of LMIC policy makers and practitioners seeking evidence from researchers to inform policy making as a result of the HSRI (qualitative/case study approach)</li> <li>• Evidence of LMIC policy makers and practitioners considering research evidence available when taking policy decisions as a result of the HSRI (qualitative/case study approach)</li> </ul>
Individual capacity development	<ul style="list-style-type: none"> <li>• Increase in proportion of successful bids led by PIs based in LMIC institutions over time</li> <li>• Number of UK and LMIC early career researchers trained / participated in project</li> <li>• Number of investigators reporting an increase in their own research-related skills and capabilities</li> </ul>
Organisational/institutional capacity strengthening	<ul style="list-style-type: none"> <li>• Increase in proportion of successful bids led by LMIC institutions</li> <li>• Evidence of improved capacity related to management, financial, and communications in funded LMIC institutions (qualitative/case study approach)</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Outcomes</i></li> </ul>	
Further health system research informed	<ul style="list-style-type: none"> <li>• Proportion of projects reporting follow-on research activity</li> <li>• Proportion of projects securing follow-on funding for further research</li> <li>• Number of research outputs cited by other research teams</li> </ul>

<p>Sustained two-way information exchange between researchers and policy makers, practitioners and communities</p>	<ul style="list-style-type: none"> <li>• Number of investigators reporting stakeholders engaged as part of HSRI project continue to exchange information with the research team beyond the HSRI project</li> </ul>
<p>Collaboration beyond HSRI project New or strengthened networks</p>	<ul style="list-style-type: none"> <li>• Number of new and strengthened collaborations</li> <li>• Number of new and strengthened networks</li> <li>• Nature and types of new/strengthened collaborations and networks, including involvement of policy makers, practitioners and communities (qualitative/case study approach)</li> <li>• Number of joint proposals and funded projects beyond the HSRI award</li> </ul>
<p>Health systems research capacity strengthened</p>	<ul style="list-style-type: none"> <li>• Number of investigators reporting an increase in LMIC investigators' research leadership capabilities</li> <li>• Increased number of applications to HSRI</li> <li>• Increased number of fundable applications to HSRI</li> </ul>
<p>Uptake of research evidence by policy makers and practitioners</p>	<ul style="list-style-type: none"> <li>• Policy makers and practitioners report use of evidence from HSRI-funded research</li> <li>• Investigators report uptake of their research findings by policy makers and practitioners</li> </ul>
<p>Improved health policy, based on evidence</p>	<ul style="list-style-type: none"> <li>• Proportion of projects contributing to changes in health policy/systems in participating countries (by types of changes, domain, geography)</li> <li>• Nature of policy change (qualitative/case study approach)</li> </ul>
<p>Implementation of changes to improve health system/s</p>	<ul style="list-style-type: none"> <li>• Number of instances where research findings were implemented in health systems (by focus area, geography)</li> <li>• Nature of changes and improvements (qualitative/case study approach)</li> </ul>
<p>Scale-up of policy influence / changes to health system</p>	<ul style="list-style-type: none"> <li>• Number of instances where research findings influence policy beyond the geography / focus area of the research project;</li> <li>• Nature, extent and location of influence (qualitative)</li> <li>• Number of instances where research findings implemented are adopted beyond the geography / focus area of the research project</li> <li>• Nature, extent and location of implementation (qualitative/case study approach)</li> </ul>
<p><i>Impacts</i></p>	
<p>Strengthened health systems relevant for communities that need them</p>	<ul style="list-style-type: none"> <li>• Evidence of strengthened health systems based on stakeholder views (qualitative/case study approach)</li> <li>• Mortality rates (overall, maternal, neonatal and infant mortality for target population); also measures of morbidity, quality of life, increased well-being and health (where relevant and available)</li> <li>• Avoidable mortality rate (for target population)</li> </ul>



Improved access to evidence-based health services	<ul style="list-style-type: none"><li>• Evidence of improved access (qualitative/case study approach)</li></ul>
Improvements in the health of people living in LMICs	<ul style="list-style-type: none"><li>• Number of individuals benefitting or potentially benefitting</li><li>• Cost savings or other efficiencies realised</li><li>• Number of lives saved</li></ul>



## 4 Impact evaluation of the HSRI

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### 4.1 Inputs and activities – The HSRI Portfolio

#### 4.1.1 Awards

A total of 92<sup>7</sup> grants were made as part of Calls 1 – 6 of the HSRI, representing an investment of £31.8m. 35 of these awards were for full grants, with a budget of £23.3m, and 57 were foundation grants, with a budget of £8.6m. 9 full grants were listed as closed, with 22 remaining active. Of the foundation grants, 31 had closed and 19 remained active. 4 full and 7 foundation grants were listed as 'In Progress'<sup>8</sup> (Table 4).

*Table 4 Number of HSRI grants (Call 1 - 6), by status*

Grant status	All grants	Full grants	Foundation grants
Active	41	22	19
Closed	40	9	31
In progress	11	4	7
<b>Total</b>	<b>92</b>	<b>35</b>	<b>57</b>

The number of awards (n=17) was highest for Calls 2 and 6 (10 foundation and 7 full, each), and lowest in Call 3 (n=12, 5 foundation, 7 full) (Figure 3). The highest number of full grants were awarded in Calls 2, 3 and 6 at 7 grants each, and the lowest in Call 5 at 4 grants. The highest number of foundation grants were awarded in Calls 4 and 5 (11 grants each) and the lowest in Call 3 (5 grants).

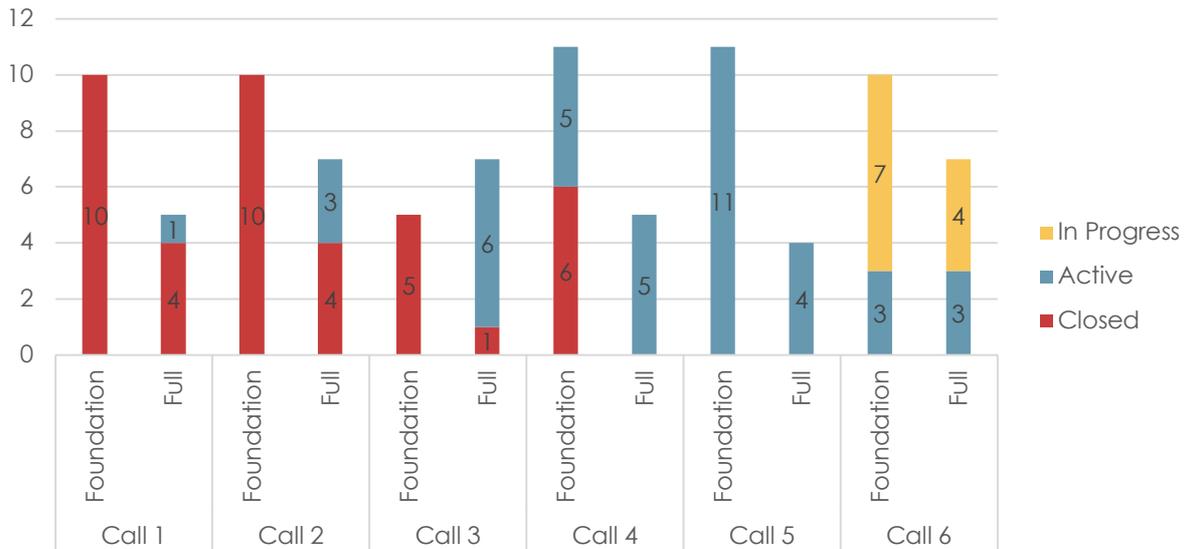
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<sup>7</sup> Three grants have two grant numbers but are counted as one in the analysis because the duplicate grant numbers are due to a Principal investigator (PI) changing institute, the PI institution changing its name and inability to transfer funds from the UK to PI location.

<sup>8</sup> Indicating that the grant is in the process of being awarded. It has been successful at Panel but is not yet fully set up to receive funding



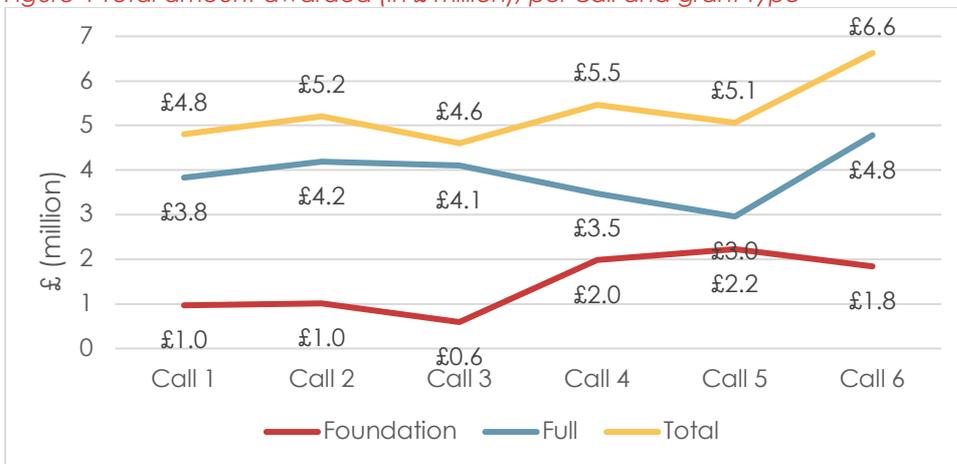
Figure 3 Number of HSRI grants by call and grant type



Source: Technopolis analysis of HSRI portfolio. Labels indicate numbers of grants

The total amount of funding awarded per call ranged from £4.6m in Call 3 to £6.6m in Call 6. The lowest amount awarded for full grants was £3m in Call 5 and the highest was £4.8m in Call 6. While the lowest amount awarded for foundation grants was £593k in Call 3 and the highest was £2.2m awarded in Call 5 (Figure 4).

Figure 4 Total amount awarded (in £ million), per call and grant type

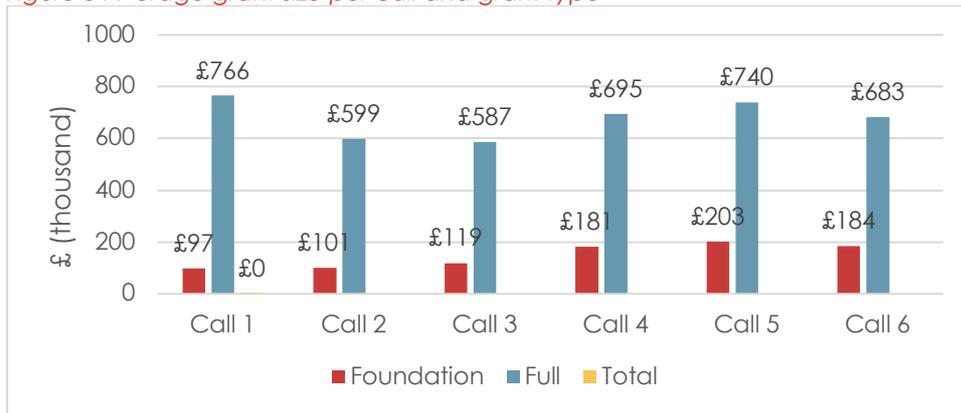


Source: Technopolis analysis of HSRI portfolio. Labels indicate sum of grants

The average grant size for full grants was £667k, and £152k for foundation grants. For full grants the lowest average grant size was in Call 3, at approx. £587k, and the highest average in Call 5, at £740k. For foundation grants the lowest average grant size was in Call 1, at approx. £97k, and the highest average in Call 5, at £203k (Figure 5).



Figure 5 Average grant size per call and grant type



Source: Technopolis analysis of HSRI portfolio

#### 4.1.2 PIs and institutes

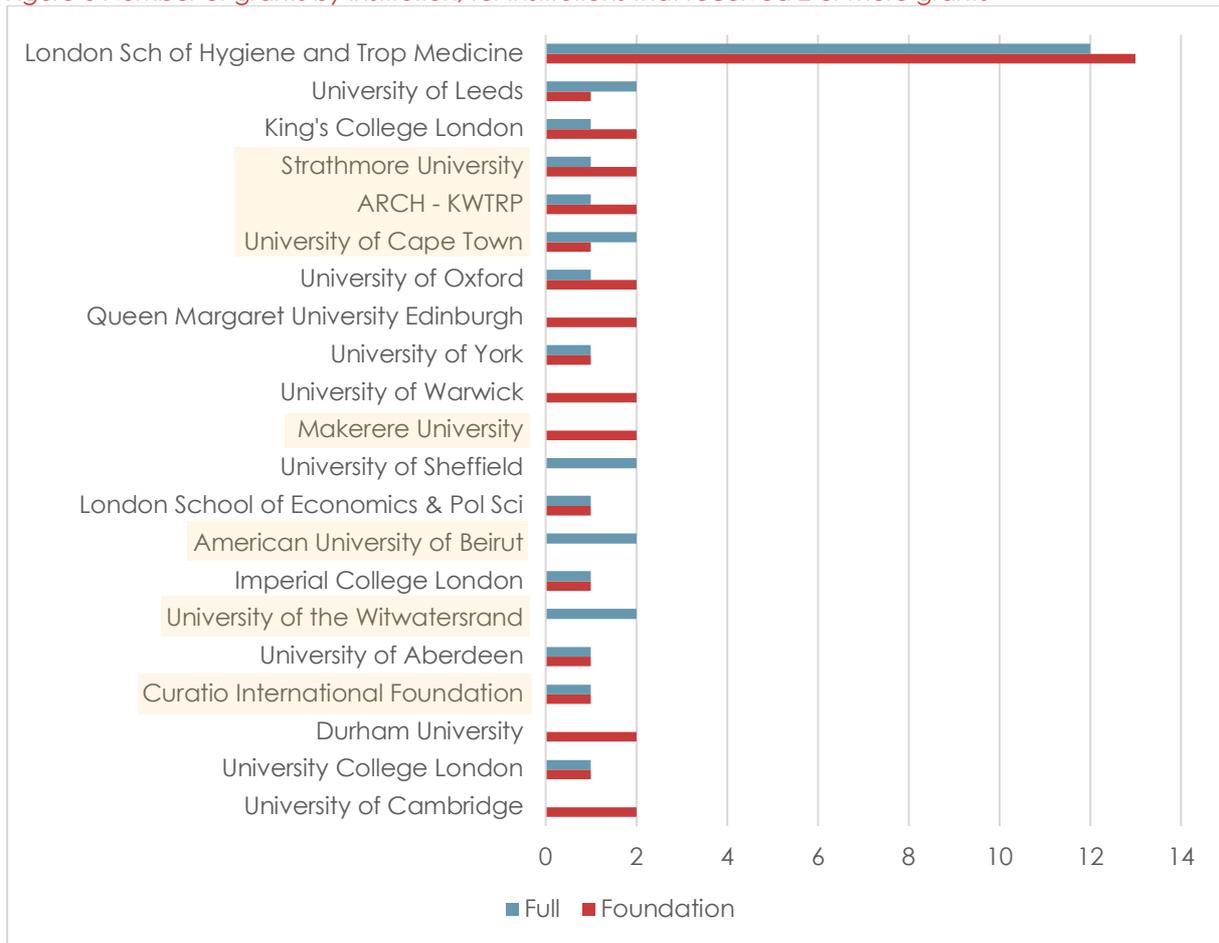
Seventy-nine PIs were listed in the HSRI portfolio. Twelve PIs (15%), none of whom were affiliated with an LMIC institution<sup>9</sup>, received multiple grants. One PI had three grants – one foundation and two full grants. The remaining 11 PIs had two grants each, of whom four PIs had two foundation grants, one had two full grants and six had one foundation and full grant each. Of the 79 PIs, 43 (54%) were women, leading 54 of the 92 HSRI grants (59%).

The London School of Hygiene and Tropical Medicine (LSHTM) received more grants than any other organisation (27%, 25 of 92 grants). The remaining grants were more evenly distributed with six institutions receiving 3 grants, 13 receiving 2 and 23 receiving one grant. In total, 43 different institutions received grants.

Twenty LMIC institutions were awarded grants, of which seven received 2 or more grants. Strathmore University (Kenya), the University of Cape Town (South Africa) and the African Research Collaboration for Health-KEMRI Wellcome Trust Research Programme (ARCH-KWTRP, Kenya) won 3 grants each.

<sup>9</sup> The London School of Hygiene and Tropical Medicine was counted as a UK-based institution regardless of where the PI or their unit are based.

Figure 6 Number of grants by institution, for institutions that received 2 or more grants



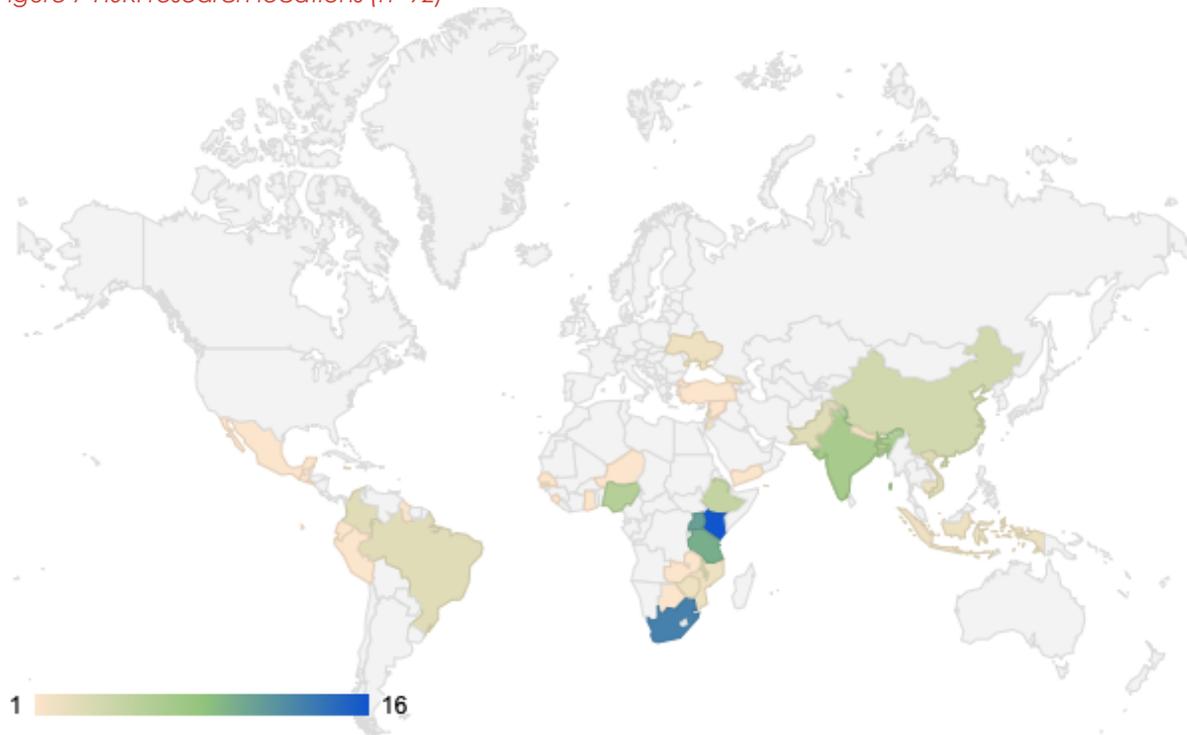
Source: Technopolis analysis of HSRI portfolio. Note: LMIC institutions are shaded yellow.

#### 4.1.3 Research location

The 92 awards covered 42 countries according to information included in the Case for Support (verified with survey and interview data where possible). One fourth of projects were multi-country involving between two to seven countries (24%, 22 of 92), with 8% (7) involving more than one continent usually Africa and Asia (5 of 7). The majority of projects concerned Africa (60%, 55 awards). Fewer awards focused on Asia (35%, 32) and Central/South America (11%, 10) (Figure 7).

The Sub-Saharan countries Kenya (17%, 16 awards), South Africa (14%, 13) and Uganda (12%, 11) accounted for the most awards.

Figure 7 HSRI research locations (n=92)



#### 4.1.4 Research areas covered

An analysis of the HRCS Health and Research Activity codes<sup>10</sup> associated with the awards shows that HSRI grants most commonly fell under Research Activity code 8.1 Organisation and delivery of services (75%, 56 of 75 grants), followed by 8.3 Policy ethics and research governance (27%, 20) and 8.2 Health and welfare economics (13%, 10). The PI survey results confirmed this to a certain extent. When asked about the HPSR building blocks (Table 1) their awards covered, 70% (19 of 27) of PI survey respondents cited service delivery as a focus of their project, followed by health workforce (44%, 12) and leadership / governance (37%, 10) (see Appendix B.1).

HRCS Research Activity code classification was more diverse among foundation grants compared to full grants (9 codes represented across foundation grants, compared to 4 across full grants). The majority of both full and foundation grants were classified as 8.1 Organisation and delivery of services (92%, 24 of 26 grants and 65%, 32 of 49 grants respectively). However, a greater proportion of full grants were classified as 8.2 Health and welfare economics (27%, 7 of 26) compared to foundation grants and a greater share of foundation grants were classified as 8.3 Policy ethics and research governance (33%, 16 of 49) compared to full grants (Figure 8).

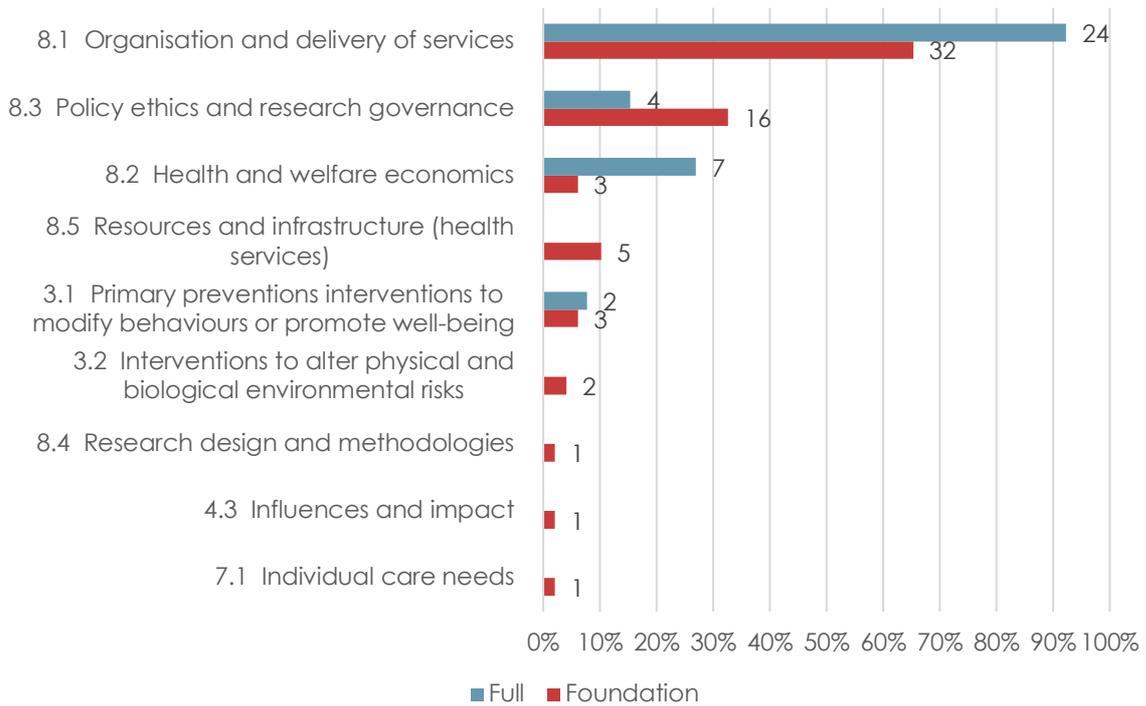
In total, 23 grants (31%, n=75) were classified to more than one HRCS research activity code, of which 20 were assigned 2 codes and three were assigned 3 codes. The most common combinations<sup>11</sup> were 8.1 and 8.3 (13 grants) followed by 8.1 and 8.2 (8 grants).

<sup>10</sup> HRCS coding was not available for grants awarded during Call 6 (10 Foundation and 7 Full). Values include double counting for grants with more than one HRCS code.

<sup>11</sup> Grants with 3 codes (8.1, 8.2 and 8.3) are double counted.

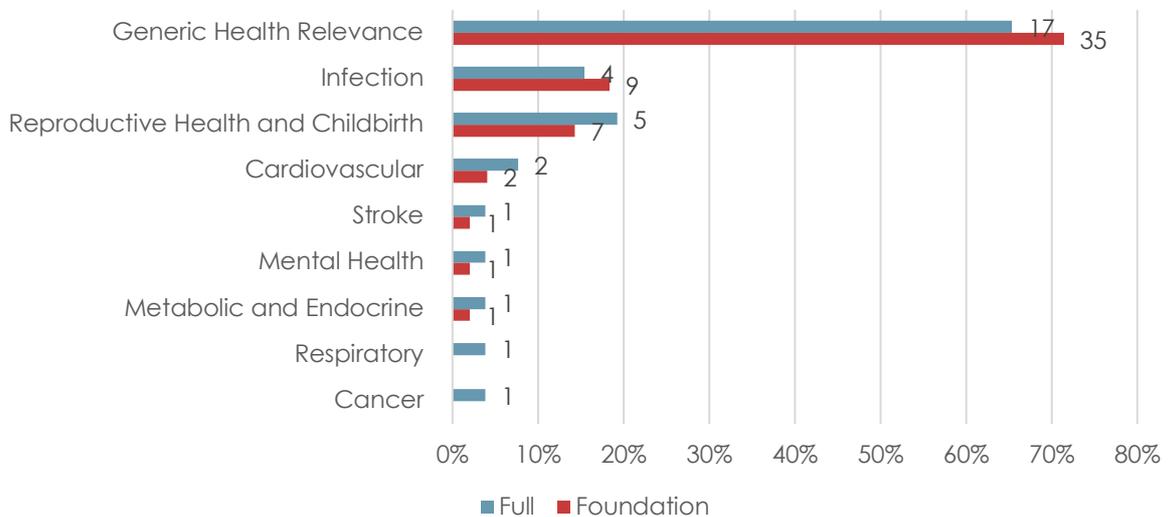


Figure 8 Share of HRCS research activity code classification, by grant type



Source: Technopolis analysis of HSRI portfolio

Figure 9 Share of HRCS health code classification, by grant type



Source: Technopolis analysis of HSRI portfolio

The most common HRCS health codes were 'Generic Health Relevance' (69%, 52 of 75), followed by 'Infection' (17%, 13) and 'Reproductive Health and Childbirth' (16%, 12). These findings were confirmed in the PI survey (see Appendix B.1).

The predominance of the 'Generic Health Relevance' code may indicate that the research being undertaken by HSRI grantees is largely disease-agnostic or also applicable to contexts other than those involving the specific health problem being researched. The classification of HSRI grants to HRCS health codes was overall similar (based on share of total grants) between



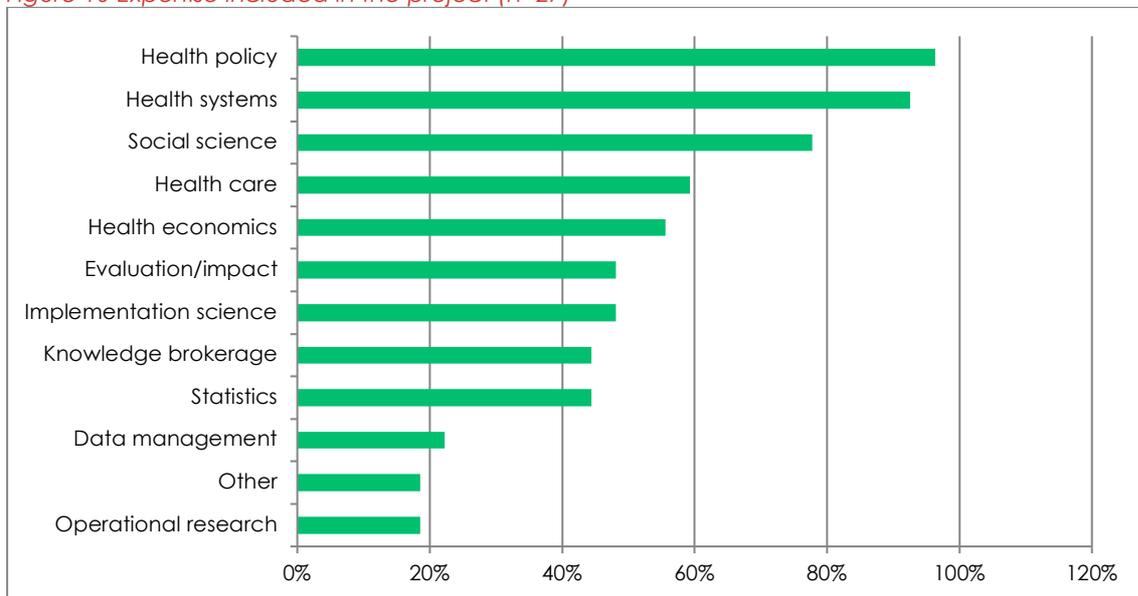
full and foundation grants (Figure 9). 12 grants (16%, n=75) were classified to more than one HRCS health code, of which 11 were assigned to 2 codes and one to 4 codes.

#### 4.1.5 Project team expertise

The expertise involved in each project as reported by the PIs is shown in Figure 10. Health policy (96%, 26 of 27) and health systems (93%, 25 of 27) expertise was most commonly included. Conversely, expertise in operational research (19%, 5) and data management (27%, 11) and patient recruitment (22%, 6) was the least frequently reported. The other category included epidemiological, participatory research, microbiological and health informatics expertise.

PIs of full awards usually reported on average six different skills, whereas PIs of development/foundation awards reported seven different skills (data not shown). Along with health policy and health systems expertise, most awards typically also included social science expertise (78%, 21), with full awards often including health economics expertise (8 of 10 full awards).

Figure 10 Expertise included in the project (n=27)



Source: Technopolis analysis of PI survey

PI interviews indicated a similar spread of expertise with most projects involving multidisciplinary teams and a mixture of qualitative and quantitative methods. Health systems, health economics, statistics, social science, health care and evaluation expertise was most commonly included. Health economics expertise was included less frequently in foundation grants.

The Co-I survey data indicates that Co-Is commonly bring expertise in health systems (65%, 65 of 100), health policy (local policy context) (42%), implementation science and social science (34% each) to HSRI projects (See Appendix B.2). Compared to foundation grants, co-Is contributed local health policy, evaluation/impact, knowledge brokerage, operational research and quantitative (e.g. data management, statistics, health economics) expertise more frequently to full grant awards. Conversely, Co-Is brought social science and implementation science skills to foundation grants more often.



## 4.2 Stakeholder engagement

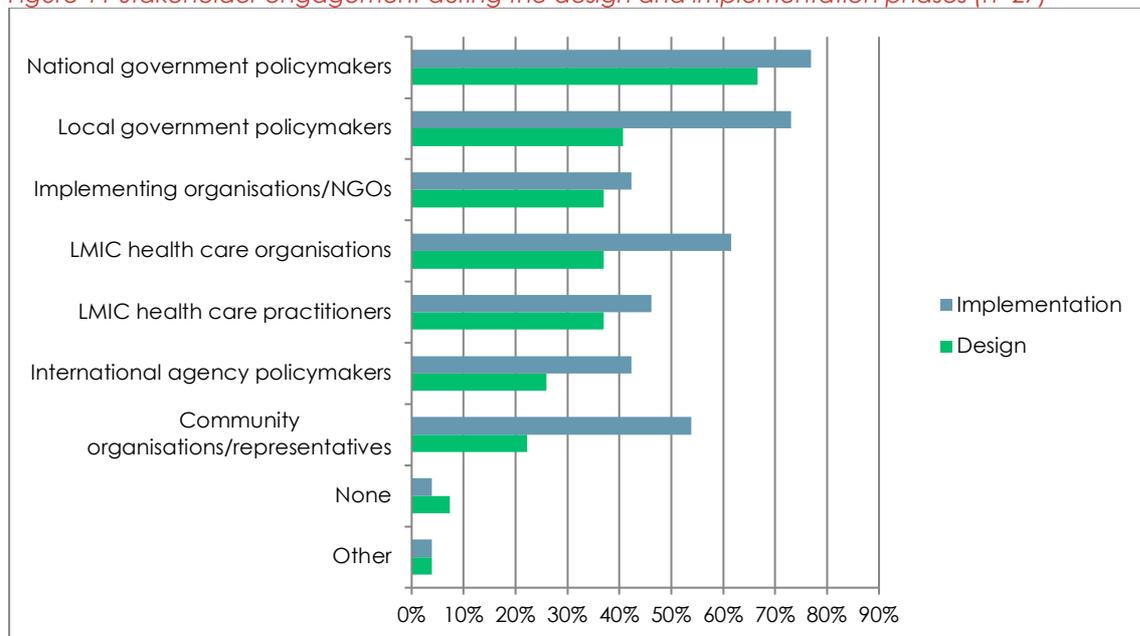
Two key objectives of the HSRI are: (1) to produce evidence relevant to decision makers and practitioners and (2) to engender capacity development with regard to HPSR among research users and producers. To that end, engagement with relevant stakeholders (policy makers, practitioners, community etc.) is considered an important aspect of HSRI project. Engagement might occur in the design, implementation or dissemination phase of an HSRI project, and allows HSRI project teams to:

- tailor the study to local conditions, needs, and cultural preferences
- generate buy-in to enable smooth implementation and data collection at research sites and minimise opposition
- raise awareness and understanding of the research and its findings as well as its potential for implementation and scale up (e.g. among policy makers and health care providers)

PIs (in survey and interviews) reported engaging with different types of stakeholders ranging from local, regional and national policy makers to international organisations (e.g. WHO, World Bank, etc.), health care organisations, practitioners, and communities during the design, implementation and dissemination phases.

Engagement in the design phase was overall to a lesser extent compared to engagement during the implementation phase (Figure 11; same observation from interviews). During project design, PIs most frequently engaged with national government policy makers (67%, 18 of 27). During implementation, stakeholder engagement included national as well as local government policy makers (77% and 73% of projects respectively), LMIC health care organisations (62%) and community organisations or representatives (54%). The types of stakeholders involved were broadly similar for full and development/foundation grants with the exception of community organisations or representatives which were much more frequently associated with development/foundation grants.

Figure 11 Stakeholder engagement during the design and implementation phases (n=27)

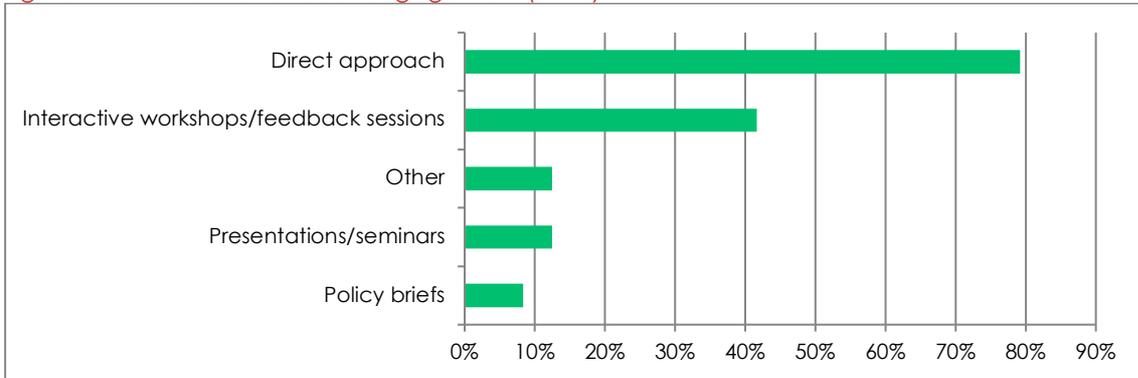


Source: Technopolis analysis of PI survey



The mode of engagement was typically a direct approach or interactive workshops/feedback sessions (Figure 12). Stakeholders are often represented in project advisory boards with engagement happening through regular meetings, for example, every six months. Eight PIs in the survey and six PIs in the interviews reported using this mechanism.

Figure 12 Mode of stakeholder engagement (n=24)

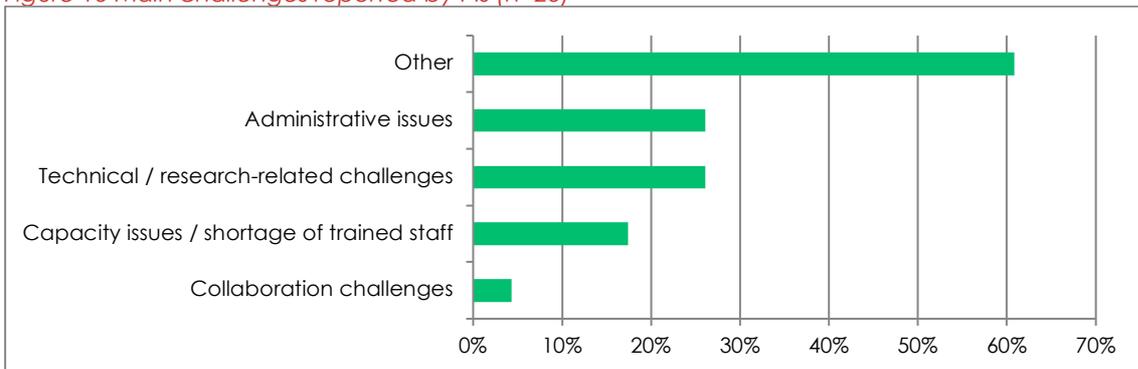


Source: Technopolis analysis of PI survey

### 4.3 Challenges

When asked about what challenges they encountered during project implementation, the majority of PIs (61%, 14 of 23, Figure 13) cited 'other' reasons, which were elaborated as being COVID-19 pandemic-related issues and delays (11 projects). Since most projects represented in the PI survey are active, this finding was somewhat expected. The next most commonly reported challenges were administrative or technical (26%, 6 of 23). Administrative challenges concerned contracting, collaboration agreements and payments.

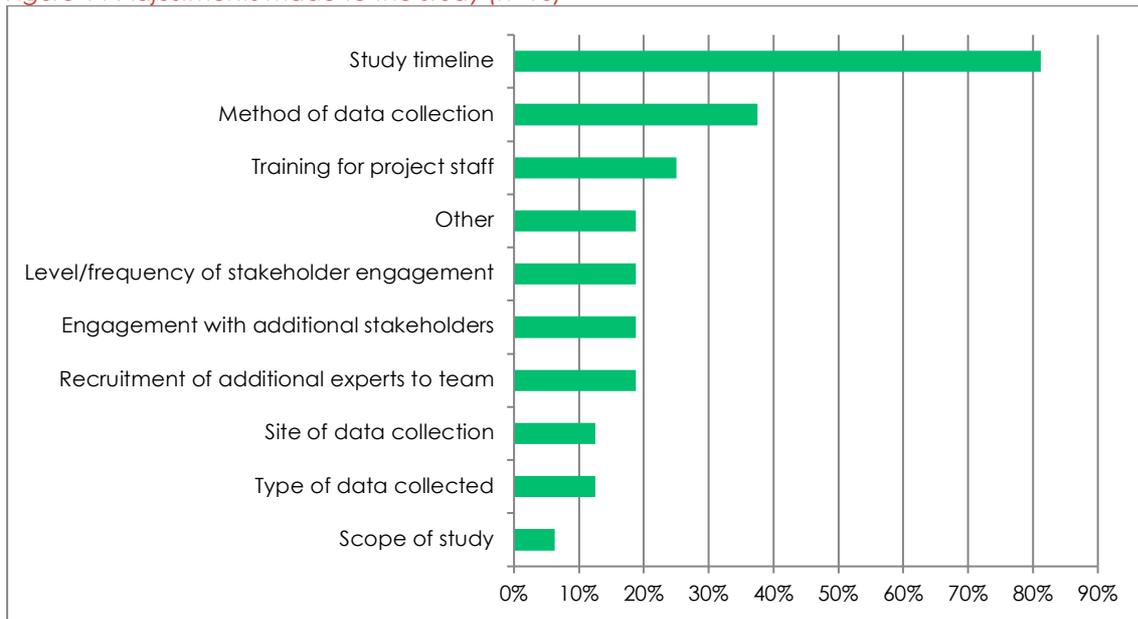
Figure 13 Main challenges reported by PIs (n=23)



Source: Technopolis analysis of PI survey

Over half of the respondents (56%, 15 of 27) reported making major adjustments to the project plan due to the aforementioned challenges. The vast majority of these adjustments were study timeline changes (81%, 13 of 16) followed by changes to the data collection methods (38%, 6) and training for project staff (25%, 4) (Figure 14). These were largely owing to the COVID-19 pandemic and involved extending timelines to accommodate delays in field work, and shift to online/remote data collection methods and engagement where possible (e.g. for interviews, focus groups, advisory board meetings, dissemination events etc.).

Figure 14 Adjustments made to the study (n=16)



Source: Technopolis analysis of PI survey

In hindsight, 48% of PIs (13 of 27) indicated they would approach the project's design or implementation differently, wherein 41% (11 of 27) would make minor changes and 7% (2 of 27) would make substantial changes (see Appendix B.1). Changes they would opt for included adjustments to the study timeline and other changes such as including a set of preliminary studies, costing a more skilled research fellow in the project for data analysis and budgeting for more face-to-face team meetings in the analysis and write-up phase (project was pre-COVID-19). When asked to provide further detail, the study timeline changes were mostly in light of the COVID-19 pandemic, but other potential changes involved including more consultation and involvement of local communities in the research and being less ambitious with the study plan so that it is commensurate with the budget and time available.

In interviews, PIs again cited challenges with COVID-19 (6 PIs) and administrative issues (3), along with some challenges in dealing with political issues (4), working with communities (3), adjusting to limited availability or transfer of policy makers participating in the project (3), quality of data available (2), and collaborating with new LMIC partners (2). Specific implementation challenges communicated in PI interviews included:

- Dealing with private sector facilities posed challenges in two projects – one looking at the quality of maternal health care in Bangladesh and another looking at risk-based innovation in Kenya. Initially, private sector facilities were wary of the research, but when they saw that the research was not going to get them penalised (e.g. through closure of the facility) and would help them improve quality of care, they became co-operative. In the Bangladeshi case, backing of government stakeholders encouraged buy-in from facilities
- One project had difficulties with recruiting a local partner in Senegal. The PI had not previously worked in Senegal and therefore did not have an established working relationship with a research organisation in the country. The organisation originally named in the grant application, turned out not to be a viable option, and was replaced. As the larger programme the project was meant to evaluate also got delayed, the timing worked out well.

- An ongoing full grant investigating inappropriate antibiotic use by informal private health care providers in rural India has faced challenges in engaging communities due to lack of obvious routes of engagement, and due to the complexity of the health care system (comprising a complex system of regulated and unregulated providers as well as regulators).
- Several challenges affected a project looking at the response to the Ebola epidemic in Sierra Leone. Challenges included lack of understanding regarding what a major international collaborative project involves, accessing remote field sites, language barrier, 'research fatigue' among study participants and constrained budget.

## 4.4 Outputs

### 4.4.1 Publications

A total of 46 awards reported 283 publications in Researchfish®. Ten awards reported 10 or more publications, with the top 3 awards in terms of the highest number of publications reporting 36, 32 and 21 publications respectively. Thirty-three awards reported having 5 or fewer publications. As would be expected, the smaller, shorter foundation grants reported fewer publications than full grants (Table 5).

Journal articles were by far the most common type of publication (accounting for 78% of all publications), followed by conference abstracts (13%) and technical reports (4%). For grants reporting publications (n=46), means of 6.2 publications per grant and 4.8 journal articles per grant were reported (Table 5).

*Table 5 Number of publications by publication type, grant type and grant status*

Type of publication	Total (n=46)	Foundation closed (n=21)	Foundation active (n=4)	Full closed (n=8)	Full active (n=13)
Journal Article	222	78	5	66	73
Conference Abstract	36	14	0	9	13
Technical Report	10	6	0	0	4
Policy briefing report	4	2	0	0	2
Other	4	1	0	1	2
Thesis	3	0	0	2	1
Book Chapter	2	1	0	0	1
Working Paper	1	1	0	0	0
Manual / Guide	1	0	0	0	1
<i>Total</i>	<i>283</i>	<i>103</i>	<i>5</i>	<i>78</i>	<i>97</i>
<i>Mean publications per award</i>	<i>6.2</i>	<i>4.9</i>	<i>1.3</i>	<i>9.8</i>	<i>7.5</i>
<i>Mean journal articles per award</i>	<i>4.8</i>	<i>3.7</i>	<i>1.3</i>	<i>8.3</i>	<i>5.6</i>

Source: Technopolis analysis of Researchfish® data

The top 10 journals where HSRI-funded research has been published are shown in Table 6. BMJ Global Health (25 publications), BMJ Open (18), and Health Policy and Planning (13) published



the most HSRI research. The majority (80%) of the top 10 journals had an open access model. Only Health Policy and Planning and The Lancet used alternative hybrid publication models. Thus, grantees seem to prefer publishing in open access journals, which is likely because of the HSRI funders' open access policy for the research they fund.<sup>12</sup>

*Table 6 Top 10 journals with the most publications*

<b>Call name</b>	<b>Open access?</b>	<b>Number of publications</b>
BMJ Global health	Yes	25
BMJ Open	Yes	18
Health Policy and Planning	Hybrid	13
PloS one	Yes	10
BMC Health Services Research	Yes	9
The Lancet	Hybrid/delayed	6
Journal of the International AIDS Society	Yes	5
Malaria Journal	Yes	4
BMC Medicine	Yes	4
Wellcome Open Research	Yes	4

Source: Technopolis analysis of Researchfish® data

#### 4.4.2 *New tools, methodologies and products*

For the purpose of this study, we have considered submissions to the tools, databases and software categories of Researchfish®, broadly as tools. Please refer to Appendix A.2 for extended analysis across types of awards.

Databases/data collections were the most reported type of tool in Researchfish®. These often involved linkage of datasets generated during the HSRI award to other existing datasets, for example, linking routinely collected patient data from health facilities with HIV cohort data. Other examples include the creation of database architecture that can be updated and maintained, such as the National Archive for Ebola-related data in Sierra Leone.

Improvements to research infrastructure were the second most reported type of tool (31 times). Examples include training courses for health advocates, development of a training manual for a survey instrument, and a paper-based tool for evaluating structural components of staffing infrastructure and equipment. Physiological assessment or outcome measure examples include a tool to measure patient satisfaction and a tool to collect community-level data on attitudes towards and use of maternal health services among women.

Tools reported in the surveys and interviews are largely data collection tools and guides e.g. survey questionnaires, systematic review protocols and a participatory policy analysis workshop guide. A couple of the tools reported are as follows.

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<sup>12</sup> <https://www.ukri.org/wp-content/uploads/2020/10/UKRI-020920-OpenAccessPolicy.pdf>;  
<https://wellcome.org/grant-funding/guidance/open-access-guidance/open-access-policy>



- Existing tools adapted and refined for assessing compliance with infection prevention and control for health workers and standardised patients
- A stakeholders' monitoring tool to improve the quality of care in public and private sector emergency obstetric care facilities in a district in Bangladesh

Novel methodologies have also emerged from HSRI projects. One new method is the use of patients as tracers to understand the way health systems are structured rather than relying on policy makers or implementers to provide the relevant information. It involves using a combination of laboratory records, folder review, facility interviews (to verify the laboratory data) and geographic-information systems to track patients through the health system.<sup>13</sup> The patient tracer method could be used in other contexts to understand patient movements through the health system to identify and interrogate underlying models of care, and hence is a valuable addition to the health systems toolbox. A feasibility study associated with the MIND project led to a method for assessing clinics' preparedness for implementing mental health interventions. This method can be used by health planners to assess and build organisational readiness of facilities in LMICs to enable adoption of interventions developed by the project. Other projects reported having adopted novel statistical approaches and remote qualitative data collection methods, including Whatsapp interviews and Zoom focus groups.

A total of 14 intervention products, 16 creative products, and 2 cases of IP were reported in Researchfish® (Appendix A.2). Health and social care service products accounted for just under half of the intervention products. Of these, half were still under development, so were yet to make an impact. Films, videos, or animations were the most commonly reported artistic/creative products (8 times). These covered webinars, documentaries and informative animations. Impacts from artistic/creative products were noted to be largely in terms of creating awareness and successfully engaging with audiences.

IP was not a common output of HSRI awards. The only examples of IP were firstly, a licensed innovation that extracts digital information from paper-based records and secondly, an application that standardises flow of village doctor follow-up visits in China.

#### 4.4.3 Capacity development

Capacity development of researchers and stakeholders (policy makers, practitioners, and community) occurred in almost all HSRI projects that were covered in the PI survey and interviews (93%, 51 of 55 projects). In most cases, capacity development occurred as a by-product of working on the projects, and in early career researchers, junior PIs and policy makers participating in the research. Formal training was reported in two instances for community stakeholders, three instances for junior researchers, and five instances for health care workers.

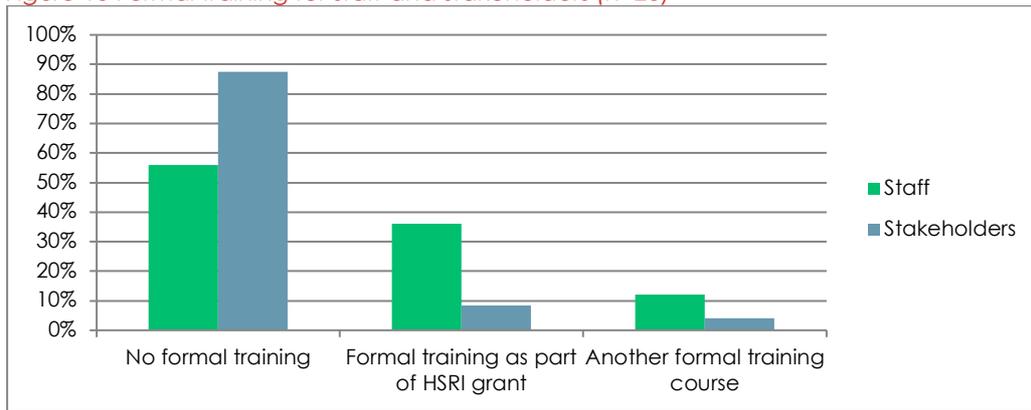
Formal training of staff and stakeholders occurred in about half of the projects covered in the PI survey (48%, n=25) and just over a tenth of the projects (12%, n=25) respectively (Figure 15). Among project staff, training in data collection methods was most common, with junior staff, students and early career researchers benefitting from courses. On the other hand, both staff and stakeholders could also avail of informal training, for example, through participatory workshops.

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<sup>13</sup> Hill, J. S., Dickson-Hall, L., Grant, A. D. et al. (2019) Drug-resistant tuberculosis patient care journeys in South Africa: A pilot study using routine laboratory data. *The International Journal of Tuberculosis and Lung Disease*, 24(1), pp. 83-91.



Figure 15 Formal training for staff and stakeholders (n=25)



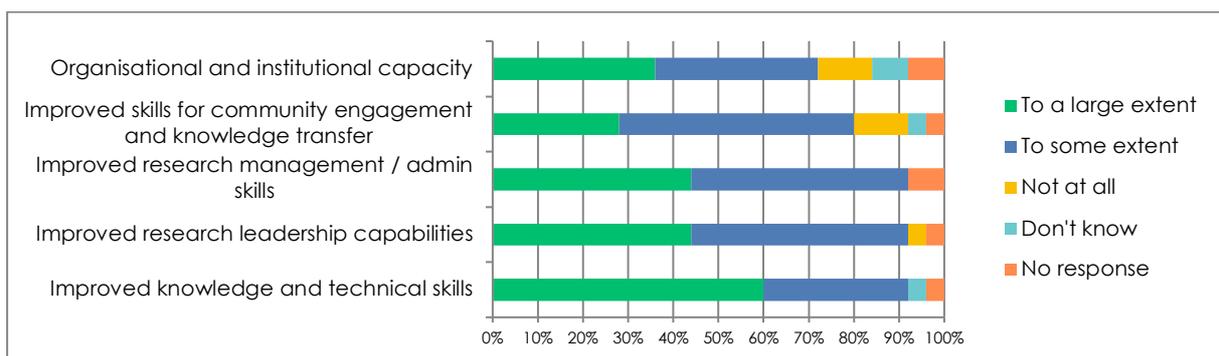
Source: Technopolis analysis of PI survey

Other capacity development activities included mentoring of LMIC PIs and researchers by HIC partners, and mentoring of junior researchers by senior researchers. Co-Is also indicated that HSRI projects were providing an opportunity to mentor early career LMIC researchers and improving their policy maker engagement skills.

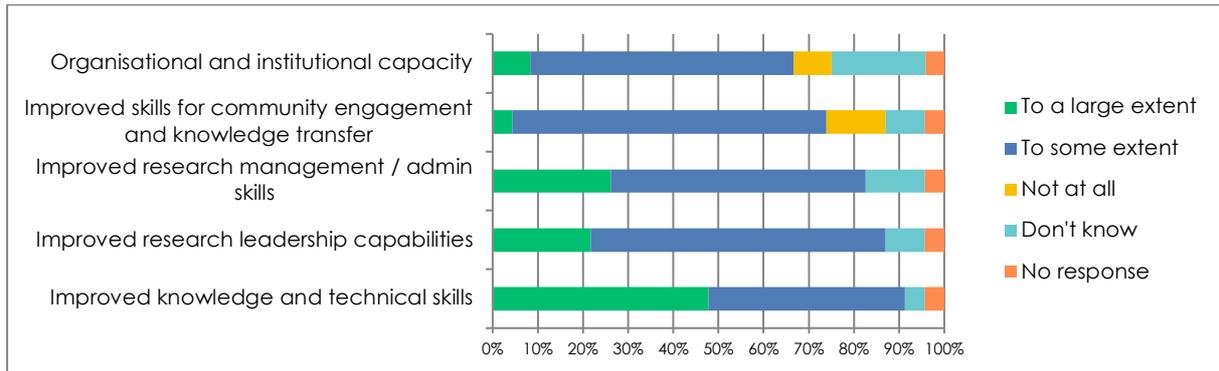
#### 4.4.3.1 Research capacity development – individuals and organisations

HSRI-funded projects have also led to capacity development for LMIC and HIC researchers and institutions (Figure 16). PIs reported that improved knowledge and technical skills was the most significant capacity development outcome in both LMICs and HICs (Figure 16). Other capacity development outcomes were reported to have occurred at a larger extent for LMIC researchers and institutions than for their HIC counterparts. These included improved research leadership, research management and administrative skills, community engagement and knowledge transfer skills and organisational/ institutional capacity. This outcome was expected as the research, particularly the data collection, was embedded in LMICs.

Figure 16 Capacity development for LMIC (a) and HIC (b) researchers and institutions (a)

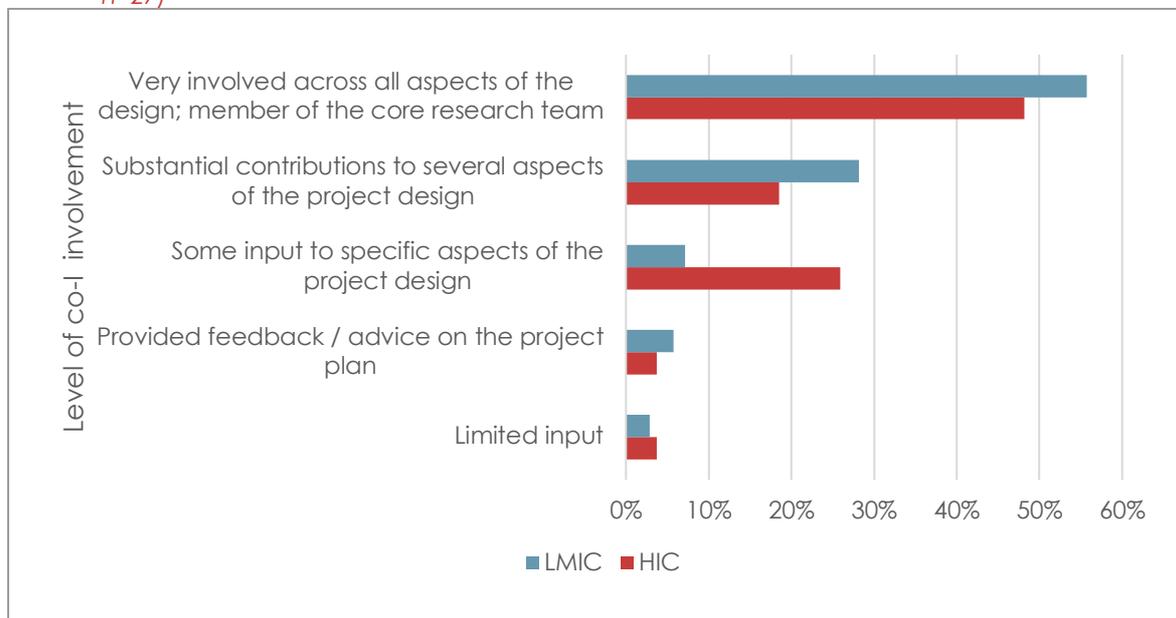


(b)



Source: Technopolis analysis of PI survey

Figure 17 Level of involvement of Co-I in design of project by Co-I institution location (LMIC, n=71; HIC, n=27)

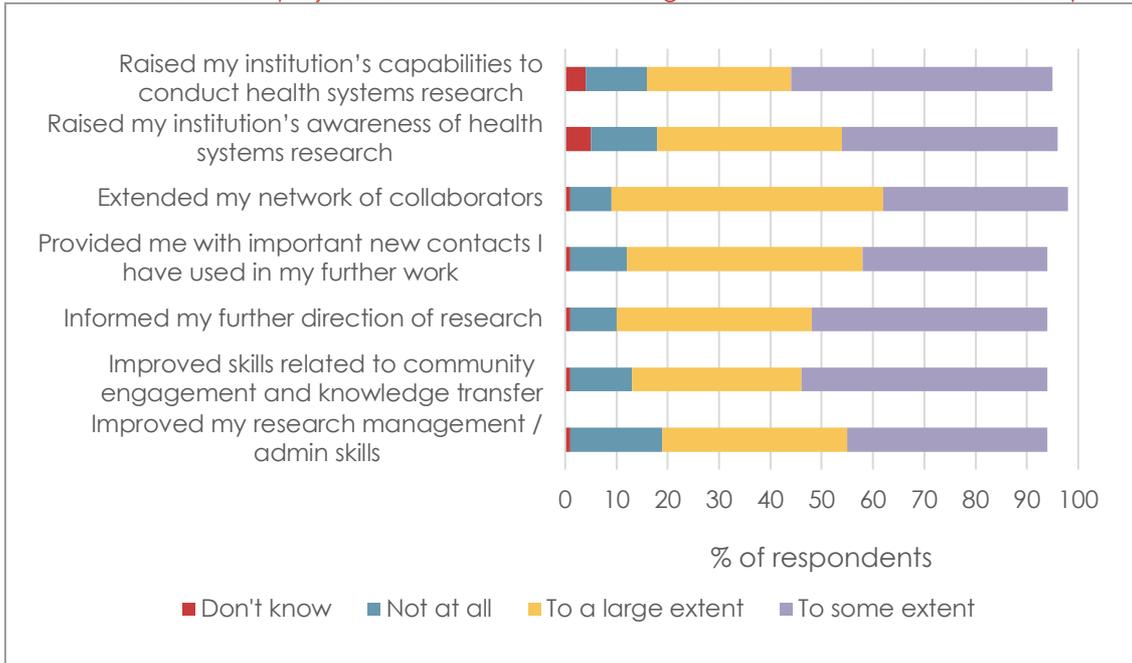


Source: Technopolis analysis of co-I survey

Co-Is also gained knowledge and experience through participating in the design and implementation of a study. 78% (78 of 100) of Co-Is reported that they had either been very involved in all aspects of the project design, or had made substantial contributions to several aspects of the study. The proportion was similar for Co-Is from LMICs and HICs (Figure 17). Most PIs of UK-led full or foundation awards indicated in interviews that LMIC researchers had been closely involved in the project design and implementation.

Co-Is reported outcomes in terms of health systems research capacity strengthening in both LMICs and HICs. The outcome that occurred to the largest extent was network building. A total of 54% (53 out of 98) of survey respondents agreed that the HSRI project extended their network of collaborators and 49% agreed that the project had provided them with contacts they have used in further work (46 out of 94). Further, HSRI projects were seen to have raised their institutions' capabilities to conduct health systems research (54%, 51 out of 95), improved their community engagement and knowledge transfer skills (51%, 48 out of 94), and informed further research (49%, 46 out of 94).

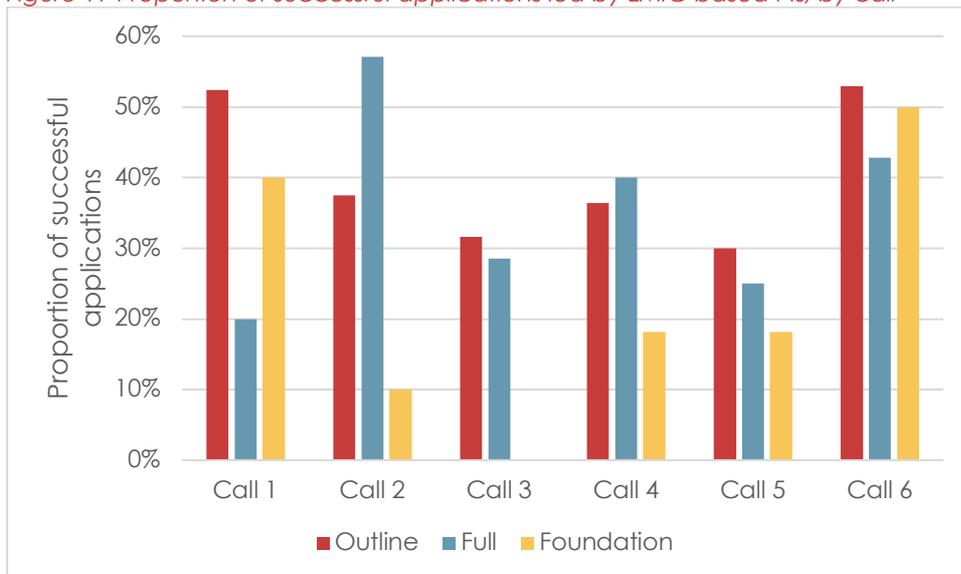
Figure 18 Influence of HSRI projects on the work of co-investigators and their research institutes (n=98)



Source: Technopolis analysis of co-I survey

Increase in HPSR capacity among LMIC researchers and institutions might be demonstrated as an increase in the proportion of successful LMIC bids among the total number of awards. As shown in Figure 19, this proportion has fluctuated across the calls and while the proportion of successful LMIC applications has increased in Call 6 compared to the previous three calls across all application types, this cannot be considered firm evidence for an increase in LMIC HPSR capacity. The success rate for LMIC applications (as a proportion of total LMIC applications) has similarly fluctuated over the years (see Appendix A.1).

Figure 19 Proportion of successful applications led by LMIC-based PIs, by call

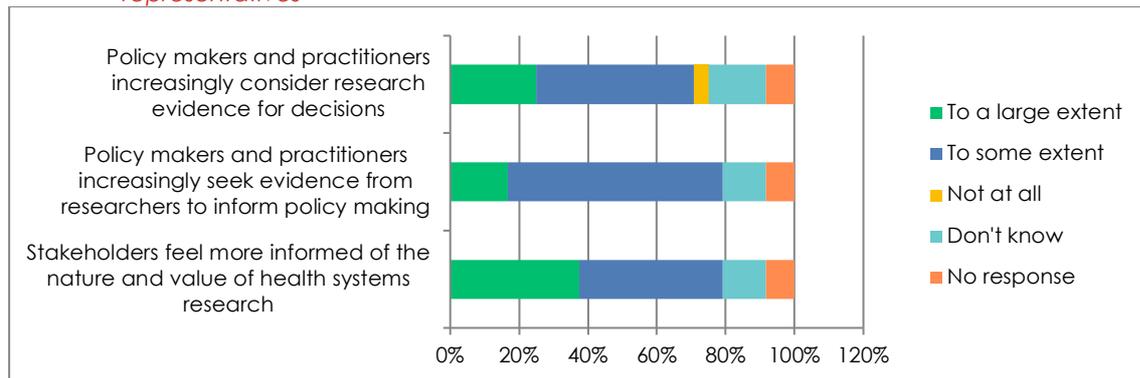


Source: Technopolis analysis of HSRI applications data

#### 4.4.3.2 Stakeholder capacity development

Most PIs also reported capacity building for LMIC decision makers, practitioners and community representatives had occurred at least to some extent (Figure 20; interviews). This included local, regional, and national policy makers; health care managers, nurses, and community health workers; and (less frequently) community organisations and members of the community. An increase in stakeholders' knowledge of health systems research occurred to the largest extent in HSRI-funded projects in the PIs' opinion. Co-Is who responded to our survey (n=93) concurred with the PIs' assessment on this topic (see Appendix B.2).

Figure 20 Capacity development for LMIC decision makers, practitioners and community representatives



Source: Technopolis analysis of PI survey

## 4.5 Outcomes

### 4.5.1 Further health system research informed – citation of publications

Only about a third of the publications (journal articles and conference proceedings) attributed to HSRI awards in Researchfish® are older than 3 years old. Given the short time period since most of the publications have been published, a full citation analysis is not yet possible.

A simple analysis of Scopus citation data of papers published between 2015 and 2019 for which DOIs were available shows that 11 papers have been cited more than 20 times, and four papers more than 50 times, indicating that findings are used by the wider research community. The number of citations per publication range from 0 to 95, with a mean of 9.7 and a median of 6 citations per publication.

Indications are that citation impact is high, as shown by an analysis of the five highest-cited papers<sup>14</sup>:

- Investing in non-communicable disease prevention and management to advance the Sustainable Development Goals, *The Lancet* 2018: Total of 95 citations, Field-Weighted Citation Impact: **10.10**
- Universal health coverage in Indonesia: concept, progress, and challenges, *The Lancet* 2019: Total of 64 citations, Field-Weighted Citation Impact: **11.32**

<sup>14</sup> Field-weighted citation impact (FWCI) is a metric that compares a given document to similar documents; a value greater than 1.0 means the document is more cited than expected according to the average over a three-year window. It takes into account the year of publication, document type, and disciplines associated with its source. Date of analysis: 11 Apr 2021

- Action to address the household economic burden of non-communicable diseases, The Lancet 2018: Total of 63 citations, Field-Weighted Citation Impact: **6.58**
- Revisiting Alma-Ata: what is the role of primary health care in achieving the Sustainable Development Goals?, The Lancet 2018: Total of 54 citations, Field-Weighted Citation Impact: **5.71**
- A cluster randomised trial introducing rapid diagnostic tests into registered drug shops in Uganda: Impact on appropriate treatment of malaria, PLoS ONE 2015: Total of 48 citations, Field-Weighted Citation Impact: **3.15**

The Field-Weighted Citation Impact of these five publications is already far above average (1.0) despite the fact that only the last publication listed was published more than three years ago (and has hence accumulated the full number of citations). The FWCI of the other publications can be expected to increase as they accrue further citations before they reach the three-year point.

Six PIs (23%, n=26) reported that their findings or outputs have been taken up by other researchers. Examples include the use of the OPERA framework<sup>15</sup> by project partners and at least two NGOs, use of newly developed household survey tools by other research groups, and the use of a tool to monitor the progress of infants by a researcher in Kenya who is using it in a rural context.

#### 4.5.2 Further health system research informed – Further funding

78 further grants were reported for 32 HSRI awards in Researchfish®. However, only 28 of these grants were for amounts greater than £10,000. Table 7 shows that over half (56.4%) of the grants were for research, a fifth (20.5%) were for travel or small personal grants and over a tenth (12.8%) were for studentships. Closed full grants leveraged more further grants on average (3.1) than closed foundation (2.1) grants.

*Table 7 Number of further funding grants by type of HSRI award*

Type of grant	Number of further grants (n=32)	Foundation closed (n=14)	Foundation active (n=4)	Full closed (n=6)	Full active (n=8)
Capital/infrastructure (including equipment)	3	2	0	1	0
Fellowship	5	0	2	3	0
Research grant (including intramural programme)	44	18	0	17	9
Studentship	10	2	0	7	1
Travel/small personal	16	10	2	0	4
<b>Total</b>	<b>78</b>	<b>32</b>	<b>4</b>	<b>28</b>	<b>14</b>
<b>Mean additional grants per award</b>	<b>2.4</b>	<b>2.3</b>	<b>1</b>	<b>4.7</b>	<b>1.8</b>

<sup>15</sup>

The Center for Economic and Social Rights developed a tool - the OPERA framework - to help civil society organisations 'break open' human rights, by giving concrete advice on how to claim human rights more effectively.



Overall, HSRI awards led to £21.4 million in further funding, with a mean grant size of £274,145. Table 8 shows the organisations that have funded 2 or more grants to HSRI grantees. A further 34 separate organisations provided 1 grant. The MRC provided the highest number of further grants (14) followed by the University of Aberdeen (6). The ESRC and GCRF Internal Pump Priming Fund (IPPF) awarded 4 grants each, but the total funding via ESRC grants was almost forty-fold higher than that awarded by the IPPF. In terms of total funding awarded, the MRC again came top with £5.2 million, followed by the ESRC with £1.3 million.

*Table 8 Organisations that provided additional funding to HSRI awards*

<b>Funder organisation</b>	<b>Number of additional grants awarded</b>	<b>Total amount awarded</b>
Medical Research Council (MRC)	14	£5,168,899
University of Aberdeen	6	£40,880
Economic and Social Research Council	4	£1,308,751
GCRF Internal Pump Priming Fund (IPPF)	4	£34,000
King's College London	2	£51,500
China Medical Board	2	£508,653
Newton Fund	2	£633,522
Save the Children	2	£46,918
Robert Wood Johnson Foundation	2	£131,200
General Electric	2	£46,044
Government of Scotland	2	£19,880
University of Birmingham	2	£101,500

Source: Technopolis analysis of Researchfish® data

Two additional UK PIs (from FCDO and GCRF/Newton Fund COVID-19 fund) and three additional LMIC PIs (Wellcome Trust Intermediate Fellowship, EU grant, NIH grant) had acquired further funding by the time of the review. One LSHTM-affiliated PI mainly based in an LMIC reported winning an ESRC grant and a GCRF grant.

#### 4.5.2.1 Further funding from HSRI

Portfolio analysis showed that 11 PIs had two grants each, of whom four PIs had two foundation grants, one had two full grants and six had one foundation and full grant each. Based on grant titles and dates, it appears that four PIs with foundation grants successfully applied for full grants. This finding was verified with three of the PIs in interviews.

Four PIs reported applying for a full HSRI grant, of whom three were not successful and one grant proposal is still under review. Two PIs applied for funding elsewhere. In one case this was because Digital Innovation for Development in Africa funding and COVID-related funding became available.

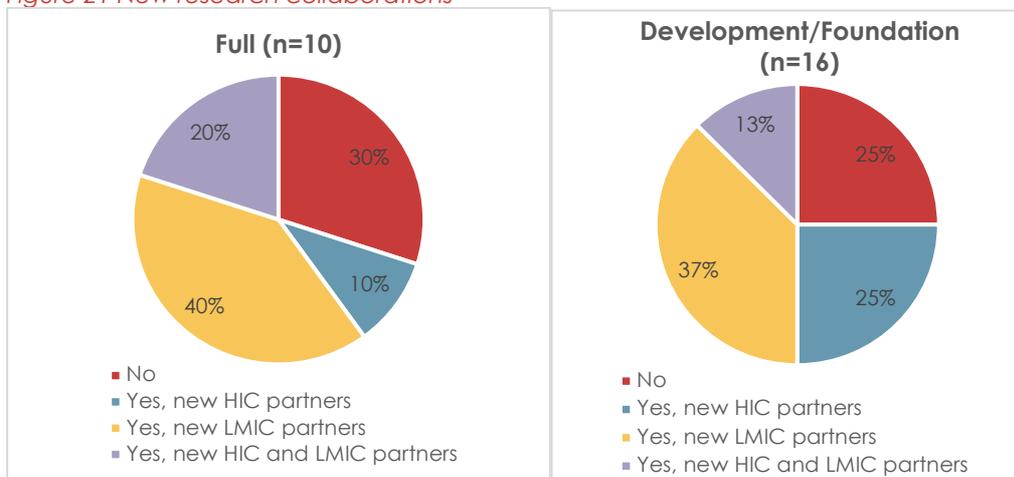
#### 4.5.3 Strengthened collaborations and networks

The majority of PI survey respondents reported working with new partners in their HSRI funded project (70% [7 of 10] of full grants and 75% [12 of 16] of development/foundation grants)

(Figure 21). New partners located in LMICs accounted for the largest proportion (around 40% for both grant types). 10% of full awards and 25% of development/foundation awards included new partners located in HICs. In contrast, full awards had more new HIC as well as LMIC partners compared to development/foundation awards (20% vs 13%). This would be expected as full awards are longer and larger projects, possibly requiring a larger variety of technical and country expertise.

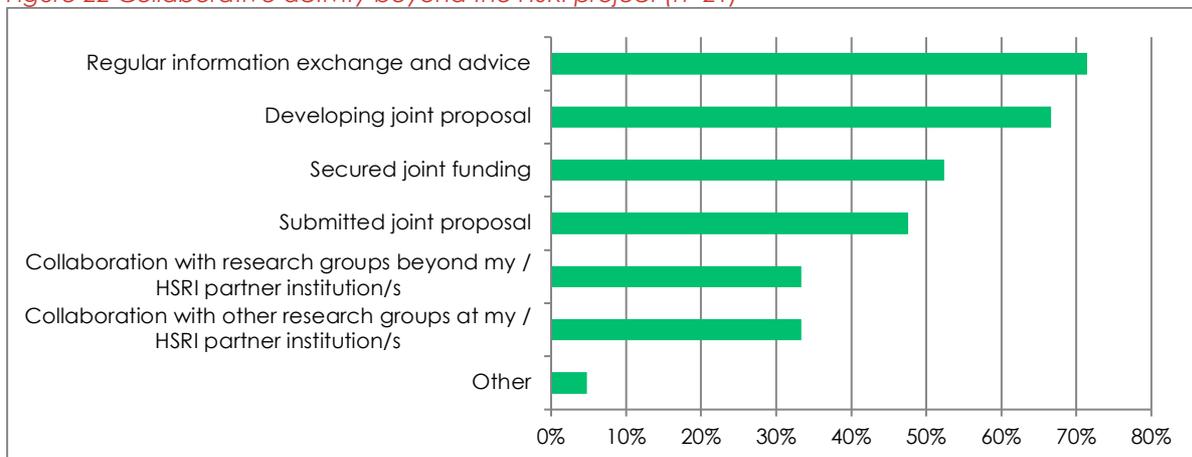
Four PIs with full grants (out of 9) and two PIs with foundation grants (out of 6) stated in interviews that they had not collaborated with their HSRI project partners before. Based on interviews, we understand that HIC-LMIC collaborations are largely equitable with LMIC partners having a substantial input and ownership over design, implementation and dissemination. However, we did come across two projects where LMIC partners were only contributing to data collection, with the core team based in the UK.

Figure 21 New research collaborations



69% (18 of 26) of PIs surveyed reported that they have collaborated or are collaborating with the new partners outside of the HSRI project. Thus, the HSRI is further supporting the strengthening of new partnerships and networks. Collaborative activities outside the remit of the HSRI project included regular knowledge exchange and interactions and joint development and submission of proposals (Figure 22).

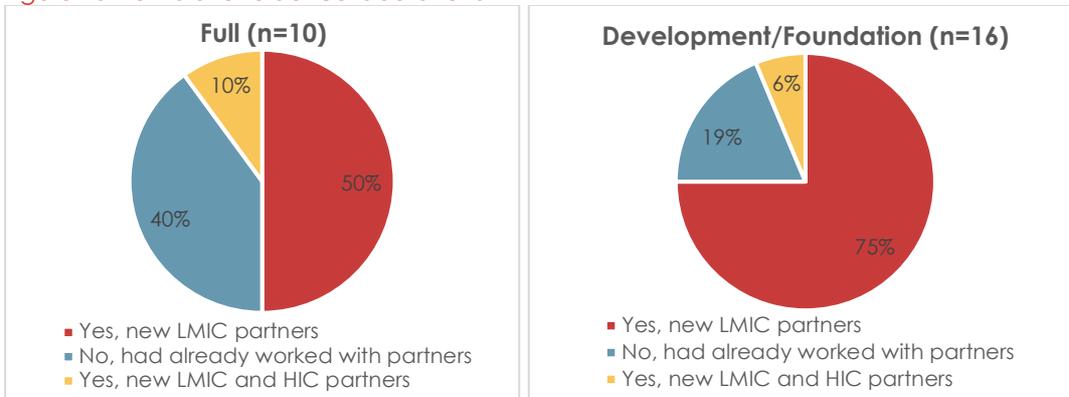
Figure 22 Collaborative activity beyond the HSRI project (n=21)



Source: Technopolis analysis of PI survey

New stakeholder collaborations were also facilitated within HSRI projects, predominantly with LMIC stakeholders (Figure 23).

Figure 23 New stakeholder collaborations



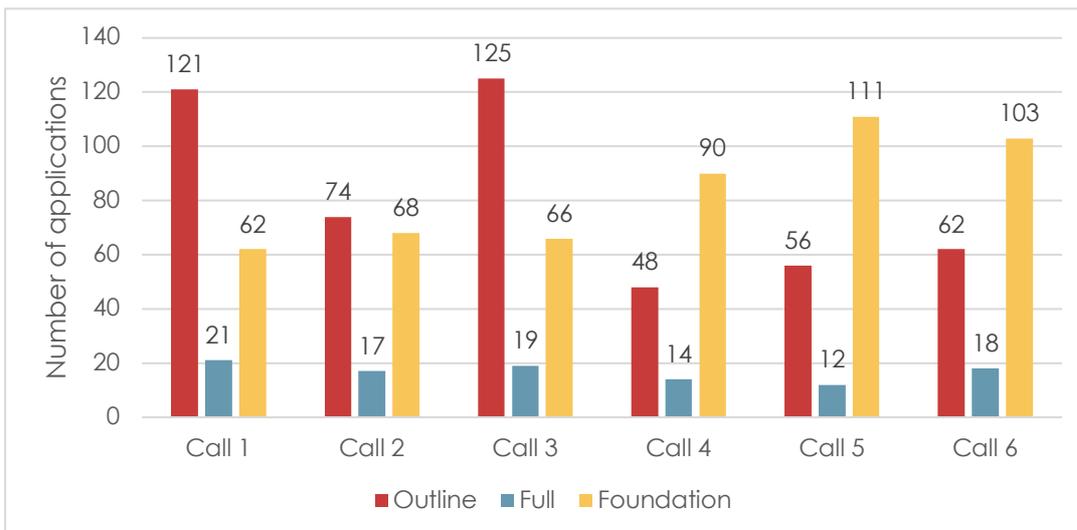
Source: Technopolis analysis of PI survey

48% (12 of 25) of PIs are engaging with these new stakeholder partners in the context of other projects while 44% (11 of 25) PIs are planning to do so in the future. In several cases, PIs included the stakeholders in other grant proposals, although not all of them have been successful.

#### 4.5.4 Health systems research capacity strengthened

One indicator of increased health systems research capacity would be the increase in the number of applications to the HSRI over the years. The number of applications has varied over the duration of the programme, showing an overall decrease after Call 3 (Figure 24). This is largely due to a decrease in the number of outline applications, even though the number of foundation applications has increased.

Figure 24 Number of applications per call



Source: Technopolis analysis of HSRI applications data

#### 4.5.5 Uptake of research evidence by policy makers and practitioners

Ten examples of the uptake of research evidence by policy makers and practitioners were reported in the surveys and interviews. For instance:

- Findings of the REVAMP project which evaluated the effectiveness of a community health worker programme in improving maternal and child health in Nigeria showed that a large-scale comprehensive intervention can improve both provision and uptake of health services, and lead to 'residual trust' in the system. This legacy effect may not be achievable through smaller programmes that focus on individual components of the system. The findings have been presented to policy makers, health professionals, NGOs and researchers at national, regional and global conferences. The study team also organised multiple dissemination workshops with federal and state decision-makers. Key stakeholders are hence aware of the evidence and have access to the policy briefs developed as part of REVAMP, which they can draw on to inform the design of future programmes
- Data from an ongoing project has helped create a pressure group that is encouraging the Ugandan government to push forward a health insurance bill in parliament (*MR/S013016/1, Testing the OPERA framework to monitor the right to health in Uganda*)
- The results from a Call 2 full award are contributing to a body of knowledge about interventions to improve quality in private health facilities in Tanzania. This is changing the nature of the debate and is likely to influence the design of and funding for such strategies in future (*MR/N015061/1, Understanding and enhancing approaches to quality improvement in small and medium sized private facilities in sub-Saharan Africa*)
- One project team has been invited twice to present at parliamentary enquiries on the future of the Indonesian national health insurance scheme (the JKN) to demonstrate the level of financial protection achieved under the JKN. The role of private health care financing in Indonesia is a very topical issue at the moment (*MR/P013996/1, Making health financing work for the poor: An evaluation of equity in health systems financing in Indonesia*)
- Results from the MIND project have directly informed a policy report commissioned by the South African Department of Health to advocate for greater investment in the integration of mental health care in chronic disease services. The study findings are also contributing to broader policy discussions about the role of community health workers and the scope of their work. (*MR/M014290/1, Strengthening South Africa's health system through integrating treatment for mental illness into chronic disease care*).
- Health officials from a district neighbouring Sedibeng in South Africa have expressed an interest in implementing a 'nurse mentor' model which has been shown to be effective in improving the performance of community health workers (*MR/N015908/1, Implementing comprehensive, integrated, community-based health care for underserved, vulnerable communities in South Africa: A practical, evidence-informed model*)

#### 4.5.6 Policy influence / health system changes

A total of 110 entries were made across 36 HSRI awards under the policy section in Researchfish®, meaning on average each of these HSRI awards reported about 3 activities with the potential for influencing policy. 'Influenced training of practitioners or researchers' was the most often reported type, accounting for 40% of all entries (see Appendix B.2). The geographic reach of the influence ranged from local (9 awards) to multi-continental/international (12). 'Participation in an advisory committee' and 'Gave evidence



to a government review' each accounted for roughly 15% of entries. The geographical reach of these awards was mainly national, perhaps to be expected given advisory committees and government reviews are usually convened at the national level.

Sixty-one (55%) of the reported activities had either no policy influence or the researchers did not know if a policy had been influenced. In the survey, two PIs stated that their projects are unlikely to result in policy or health systems changes because they were development awards and it would be the follow-on studies that would lead to impact. For PIs that did report outcomes for the policy activities in Researchfish®, the most often reported outcome was 'improved educational and skill level of workforce' (25 instances). Other outcomes of policy-oriented engagement were improved regulatory environment (10 times) and changed public attitudes (8 times).

#### 4.5.6.1 Changes to health policy / practice guidelines

We found seven examples of changes to health policy or practice guidelines (two in progress), which include

- A monitoring tool for periodic audit of and providing feedback on public and private sector maternal and neonatal health facilities at the district level in Bangladesh is still not in use, but its feasibility and value has been demonstrated through the HSRI grant. The findings have been included in the Ministry of Health and Families National Strategy document. The results were used as evidence for the need for good communication and motivation, both crucial aspects of health system responsiveness (*MR/M001717/1, Stakeholder monitoring to improve quality of Maternal Neonatal care in public and private sector facilities following a district health systems approach*)
- Insights from an HSRI study have provided invaluable evidence on the determinants affecting medical equipment management in Vietnam. This evidence came at a critical time: in May 2016, the Vietnamese government issued the first Decree on the management of medical devices (Decree No. 36/2016/ND-CPD).<sup>16</sup> The results from the study directly informed the policy and recommendations for changes within hospitals and the regulatory framework of the Ministry of Health to improve medical device management in Vietnam. (*MR/M002306/1, Determinants of medical equipment performance to improve management capacity within health system in Vietnam*)
- Findings from an HSRI-funded study have been used to develop draft recommendations for strategic development of neonatal health care services in Kenya. They have also been used to inform ongoing policy discussions about the need for improved professional staffing and support workers in Kenyan hospitals. (*MR/M015386/1, Health Services that Deliver: Improving Care for Sick Newborns (HSD-N)*)

#### 4.5.6.2 Implementation of policy/practice changes to improve health system/s

We found evidence of implementation of policy/practice changes in three HSRI projects.

- Influence on India's Kerala State Government's health system developments for clinical information exchange between providers (*MR/M00287X/1, Enhanced integration of primary and secondary health systems and patient empowerment through improved continuity of patient care and clinical handover*)
- The National Director for Drug-resistant tuberculosis (DR-TB) is adopting outputs of HSRI research to implement health systems strengthening components in the South African DR-

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<sup>16</sup> [https://www.tilleke.com/wp-content/uploads/2016/10/2016\\_Oct\\_Medical\\_Device\\_Regulations\\_Vietnam.pdf](https://www.tilleke.com/wp-content/uploads/2016/10/2016_Oct_Medical_Device_Regulations_Vietnam.pdf)

TB programme. (MR/N015924/1, *Optimizing health systems to improve delivery of decentralised care for patients with drug resistant tuberculosis*)

- A new 'rubber-stamp' method that allows paper-based record keeping to be integrated with digitalisation is being used by World Friends, an NGO providing health services in socially disadvantaged areas in Kenya, and similar groups in other countries. (MR/N005015/1, *Guideline Adherence in Slums Project – Template-based documentation and decision support for primary health care clinics in the private sector*)

#### 4.5.6.3 Scale-up of policy influence / changes to health system

The three examples of scale-up were

- Countries like Uganda, Burkina Faso, Nigeria and the Democratic Republic of Congo are trying to learn from Kenya's experience of implementing smart, risk-based health systems regulation. One PI is a core participant in this engagement and has been providing advice based on his experience from his HSRI-funded and other projects to the heads of the Ugandan regulatory agencies for doctors and nurses who are designing a joint regulatory inspection system. (MR/P014291/1, *Understanding the Impact of Innovations in the Regulation of Kenya's health facilities*)
- The project looking at the lessons to be learnt from emergency responses to the Ebola epidemic in Sierra Leone has influenced the international response to the Ebola outbreak in the Democratic Republic of Congo and informed Sierra Leone's response to COVID-19, which was seen as comparatively effective and involved communities in finding solutions more than had been the case in previous outbreaks. (MR/N015754/1, *Building resilient health systems: lessons from international, national and local emergency responses to the Ebola epidemic in Sierra Leone*)
- The ART Access App, a web and phone based app that allows patients to access their HIV medication at a community pharmacy instead of at their main government clinic, has been chosen for national scale-up by the Ministry of Health, Uganda. (MR/R00420X/1, *MICA:Development of new paradigm in differentiated care for HIV patients; Community pharmacy drug refill using the ARTAccess Mobile phone application*)

#### 4.5.7 Potential for future policy influence or health system changes

Several of the projects are as yet ongoing and results are emerging or yet to be published. PIs are often wary of conducting large scale dissemination activity (beyond the team members and close collaborators) before findings are published. Moreover, implementation of findings may be delayed for several reasons e.g. political will and availability of resources. These situations however do not diminish the potential of the research findings or tested interventions/tools to influence policy or effect health system changes in the future. A couple of such examples are discussed below.

- Findings from one HSRI study could inform regulatory reforms globally, not just in Africa, owing to the PI's recent appointment to the World Health Organization technical expert group on regulation. The PI also has a close working relationship with the World Bank, which offers the opportunity to feed the findings into health system regulations elsewhere in the world. (MR/P014291/1, *Understanding the Impact of Innovations in the Regulation of Kenya's health facilities*)
- The study team from the MIND project is collaborating with the South Africa Addiction Technology Transfer Centre (SA-AATC), which provides resources for professionals in the HIV, mental health, addictions treatment and recovery services fields, to build capacity and scale up the use of MIND screening tools and interventions. The SA-AATC has committed

funding to disseminate training briefs to non-governmental organisations and other service providers to facilitate wider use of MIND interventions. (MR/M014290/1, Strengthening South Africa's health system through integrating treatment for mental illness into chronic disease care)

#### 4.5.7.1 Enablers and barriers of policy influence or health system changes

Table 9 below lists the enablers and barriers that influence the take up of HSRI research findings into policy or practice, their implementation and scale-up outside the research location. These factors were identified from the PI interviews (n=28) and hence reflect enablers and barriers that were applicable in some specific cases. Thus, this is not an exhaustive list and other factors may have influence.

Table 9 Enablers and barriers

Type of influence / change	Enablers (n, number of instances)	Barriers (n, number of instances)
Changes to health policy/ practice guidelines	Active engagement with policy makers and practitioners (knowledge transfer/buy-in) <ul style="list-style-type: none"> <li>- Consultations/updates during the design and/or implementation of the research e.g. included in an advisory group, formal stakeholder meetings (n=6)</li> <li>- Active participation in the research project e.g. as a core team member (n=5)</li> </ul>	Research not conclusive; further evidence required (n=3)
	Timeliness, relevance and robustness of evidence e.g. evidence produced when a new policy or guideline is being drafted (n=4)	
Implementation	Government / policy maker support for the research encourages practitioners to implement findings (n=7)	Engaged policy makers or practitioners no longer in post (staff turnover) (n=3)
	Research team seen as trusted partners rather than outsiders or evaluators (n=2)	Budget constraints (n=2)
	Training of practitioners to deliver an intervention (n=4)	Challenging political environment (n=2)
Scale-up	PI or co-I has partnership or appointment with national ministry of health or an international organisation, e.g. World Bank, WHO, creating wider influence and trust (n=4)	Budget constraints; further evidence required (n=2)

## 4.6 Impacts

With few closed full awards (n=9) and a large proportion of active projects that have not published their main findings, findings for most HSRI projects have not had the chance to be implemented or scaled up. Consequently, impacts on health systems (strengthening or improved access) or attributable improvement of lives of people at the population scale have yet to accrue.

In the interviews, several PIs noted that impacts on health systems or populations would occur in the long term and they would be difficult to attribute to individual HSRI projects. Policy makers



and practitioners are likely to rely on evidence from multiple studies to implement system-wide change and in turn multiple, parallel health system changes will underpin system-wide impacts such as the ones desired in the TOC.

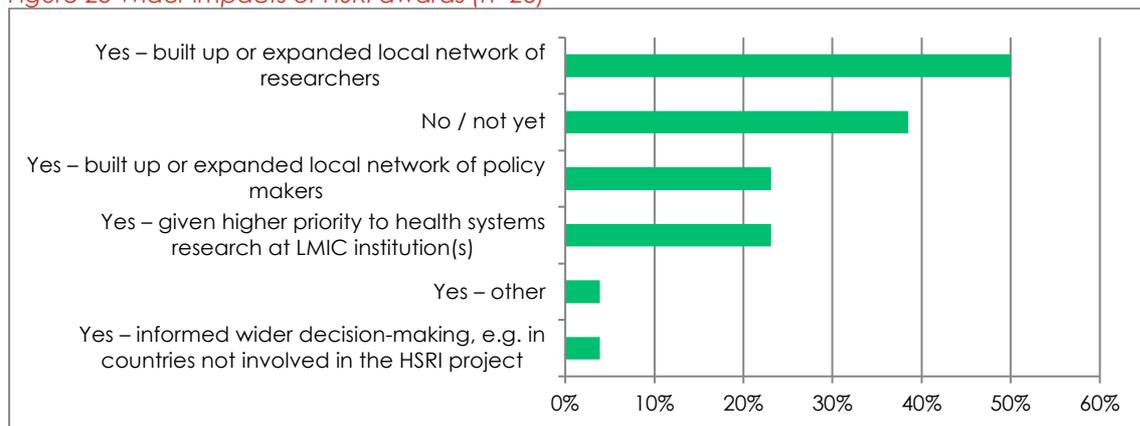
There is some evidence however of health benefits for study participants. For instance, the “System-Integrated Technology-Enabled Model of Care Aiming to Improve the Health of Stroke Patients in Resource-Poor Settings in China” project undertook a randomised controlled trial (RCT) where patients in the intervention arm (up to 650 people) experienced reduction in blood pressure, stroke recurrence, hospitalisation, and mortality as well as overall improvements in lifestyle. Capacity building (through training) of primary and secondary care health professionals also took place in this project. However, more time needs to pass so that these activities and project outputs can be scaled up to lead to impact on individuals outside the study population or indeed the health system.

Another example of health benefit included a pilot test of a therapeutic intervention that revealed significant reductions in alcohol use and symptoms of depression and psychological distress (MR/M014290/1, *Strengthening South Africa's health system through integrating treatment for mental illness into chronic disease care*).

#### 4.6.1 Wider outcomes and impacts

Further impacts that were not directly related to the research question were also reported (Figure 25). Results of the co-I survey were very similar (Appendix B.2). Examples included a higher profile for health systems research in Colombia; expanded stakeholder networks; creation of an international network of researchers with an interest in improving regulation of health professionals; a new research and education stream on digital health at St Francis College of Health and Allied Sciences, Tanzania has been developed; and requests for health informatics expertise from the Ugandan Ministry of health to support transformation of health services using digital health.

Figure 25 Wider impacts of HSRI awards (n=26)



Source: Technopolis analysis of PI survey

Wider outcomes beyond the focus of the HSRI project were also identified from PI interviews. For instance, a project focussing on inappropriate use of antibiotics by informal private health care providers in rural India has led to informal providers being designated as a separate category and being included in an official national survey. Another project has provided key input towards a new training module for a master's course in hospital management at the



Hanoi University of Public Health in Vietnam and training materials for a five-day course to build capacity of health professionals working in the area of hospital management.

#### 4.6.2 *Likelihood of future impact*

With few HSRI projects having achieved impact we may look for outcomes as interim indicators of the likelihood of impact further downstream. These may include policy or practice change; implementation of interventions, policies or practices; and their scale-up.

Where the aforementioned outcomes have not been achieved, the presence of relevant enablers (as described in Table 9) may indicate a higher likelihood of the research findings leading to outcomes that could ultimately lead to system-wide impact. This holds true even for projects with 'negative' research findings since these contribute to the body of evidence that policy makers and practitioners can rely on for decision making and implementation.

Nonetheless, it should be remembered that the presence of interim indicators or enablers does not guarantee that downstream outcomes and impact will eventually be achieved. Policy/practice changes, implementation, and scale-up will rely on multiple factors including the political context and availability of resources as well as the willingness (primarily) of policy makers and practitioners to effect these changes. Thus, the role of HSRI projects (via the relevant research teams) in facilitating downstream system-wide impact will be through engagement and knowledge exchange (including capacity building) with research users such as policy makers and practitioners.

Moreover, foundation grants, being smaller and often more exploratory, the likelihood to accrue impact in the future will depend on follow-on research, as was pointed out by two respondents to the PI survey.

#### 4.7 *Impact case studies – summaries*

This section presents 15 summary impact case studies (Table 10) to illustrate the range of scientific, policy and health systems outcomes achieved, and the activities that have underpinned these outcomes. The full case studies are available in Appendix F.



Table 10 Overview of impact case studies

Topic (Grant number)	Call no. – grant type	Research location/s	Capacity building	Policy/practice outcome type	Further funding	Potential for future impact	Reference
Decentralised care for patients with drug resistant tuberculosis (MR/N015924/1)	2–Full	South Africa	Researchers, policy makers	Implementation		Yes	Section 4.7.1 Appendix F.1
Community health workers programme in improving maternal and child health (REVAMP; MR/M01472X/1)	1–Full	Nigeria	Researchers	Uptake of research evidence by policy makers	Yes	Yes	Section 4.7.2 Appendix F.2
Integrating treatment for mental illness into chronic disease care (MIND; MR/M014290/1)	1–Full	South Africa	Researchers, Practitioners	Uptake of research evidence by policy makers	Yes	Yes	Section 4.7.3 Appendix F.9
Community-based health care for underserved, vulnerable communities (MR/N015908/1)	2–Full	South Africa	Researchers, Practitioners	Uptake of research evidence by practitioners		Unclear (Barriers to implementation)	Section 4.7.4 Appendix F.3
Maternal Neonatal care in public and private sector facilities (MR/M001717/)	1–Development	Bangladesh	Practitioners	National policy change	Yes	Yes	Section 4.7.5 Appendix F.4
Innovations in the Regulation of health facilities (MR/P014291/1)	3–Full	Kenya	Researchers, policy makers	Informed regulatory reforms Scale-up	Yes; from HSRI	Yes	Section 4.7.6 Appendix F.5
Determinants of health worker performance (MR/M014681/1)	1–Full	Senegal		Potential for uptake by policy makers (negative results)		Yes	Section 4.7.7 Appendix F.6
System-integrated technology-enabled model of care for stroke patients (MR/N015967/1)	2–Full	China	Researchers, Practitioners	Health benefit to study participants		Unclear (scale-up study needed)	Section 4.7.8 Appendix F.7
Strengthening health system responsiveness to marginalised communities (MR/P004555/2)	3–Development	Guatemala	Researchers, Policy makers, Community stakeholders	Potential for uptake by policy makers		Yes	Section 4.7.9 Appendix F.8



Verbal Autopsy with Participatory Action Research (VAPAR, MR/N005597/1)	2- Development	South Africa	Policy makers, Community stakeholders	Potential for uptake by policy makers	Yes; from HSRI	Yes	Section 4.7.10 Appendix F.10
Inappropriate antibiotic use by informal private health care providers (MR/P004512/1)	3- Development	India	Researchers, Policy makers	Potential for uptake by policy makers	Yes; from HSRI	Yes	Section 4.7.11 Appendix F.11
Community health workers' use of mobile phones (MR/R003963/1)	4- Foundation	Ghana, Malawi, Ethiopia	Researchers	Potential for uptake by policy makers		Unclear (follow-on study needed)	Section 4.7.12 Appendix F.12
Guideline Adherence in Slums (MR/N005015/1)	2- Development	Kenya	Researchers	Implementation	Yes	Yes	Section 4.7.13 Appendix F.13
Lessons from international, national and local emergency responses to the Ebola epidemic (Ebola Gbalo, MR/N015754/1)	2-Full	Sierra Leone	Researchers Institution	Informed practice Scale-up		Yes	Section 4.7.14 Appendix F.14
Determinants of medical equipment performance (MR/M002306/1)	1- Development	Vietnam	Practitioners	Informed legislation		Yes	Section 4.7.15 Appendix F.15

#### 4.7.1 *Optimizing health systems to improve delivery of decentralised care for patients with drug resistant tuberculosis (MR/N015924/1, £578,055)*

Drug-resistant tuberculosis (DR-TB) presents a major burden for health systems in sub-Saharan Africa, including in South Africa. To tackle this burden effectively, South Africa decided to decentralise DR-TB services away from hospital-based care in 2011 partly owing to reports that suggest decentralised care leads to similar or better outcomes while being more acceptable to patients and reducing provider costs.

The project which ran until December 2020 aimed to identify how decentralisation had taken place and evolved in the 5 to 7 years after the launch of the national decentralisation strategy. The study was conducted in three South African provinces – Eastern Cape, Western Cape and KwaZulu Natal – by a multidisciplinary team of experts led by Mark Nicol (University of Western Australia, previously University of Cape Town), Dr Mosa Moshabela (University of KwaZulu-Natal) and Dr Lindy Dickson-Hall (University of Cape Town).

The project involved strong engagement with the South African National and Provincial Departments of Health, through presentations at stakeholder meetings and personal engagement with the National Director for DR-TB who is adopting the research outputs to implement health systems strengthening components in the South African DR-TB programme. The stakeholder meetings allow the team to disseminate their findings to all South African provinces (including those not involved in the study) and to provide advice for future provincial / district strategies for decentralisation. The project also built capacity among researchers and policy makers, highlighted the importance of 'champions' in driving decentralisation, piloted a new patient-based tracking approach to identify models of care, and developed the 'sweet spot' theory of decentralisation which determines the ideal location for patient/s to receive the ideal degree of decentralised DR-TB care.

#### 4.7.2 *Determinants of effectiveness of a novel community health workers programme in improving maternal and child health in Nigeria (REVAMP; MR/M01472X/1, £939,292<sup>17</sup>)*

The project aimed to assess the effectiveness of the Community Health Worker (CHW) component of a large government programme aiming to support equitable access to quality maternal and child health services (SURE-P/MCH). REVAMP was led by Professor Tolib Mirzoev, University of Leeds, and included a multi-disciplinary team from the Nuffield Centre for International Health and Development at the University of Leeds, and from The College of Medicine University of Nigeria Enugu Campus. This full grant was funded through Call 1 of the HSRI from June 2015 to February 2021.

REVAMP's methodological approach, realist evaluation, was relatively novel for global health policy and systems research: Large-scale government programmes tend to be evaluated through economic, impact or process evaluations, while REVAMP focussed on explaining the underlying factors behind the causality, for example through 'reasoning', i.e. the motivations and feelings of individuals that impact on the effectiveness of an intervention. The study team delivered the project in close collaboration with the Nigerian government (Ministries of Health at both federal and state levels) - a crucial element in realist evaluation, as it requires continuous engagement with stakeholders to construct, and then refine, programme theories.

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<sup>17</sup> The award was originally for £794,948; the budget was increased based on indexation



REVAMP's findings provide important considerations for future interventions: The study showed that a large-scale comprehensive intervention such as SURE-P/MCH can improve provision and uptake of health services, and lead to 'residual trust' in the system beyond the duration of the programme – a legacy effect that may not be achieved by smaller programmes that focus on individual components of the system. The research also highlighted the important roles advocacy, patient-provider trust, facility security, health worker motivation and data quality play in the provision and uptake of maternal and child health care (MCH). Security and trust emerged as important aspects during in the study; as the study team reported: "During a feedback workshop, Nigerian policymakers reflected that, since security is such a mundane and routinely evident issue, they had never linked it with provision or uptake of health care."

To date, REVAMP has reported its results in eight publications in the academic literature. The study team also prepared multiple policy briefs and presented findings at numerous national and international conferences to policy makers, health professionals, non-governmental organisations (NGOs) and researchers. Key stakeholders are aware of the evidence, which they can draw on to inform the design of future programmes, and lessons learned in implementing the realist evaluation can support further research.

#### 4.7.3 *Strengthening South Africa's health system through integrating treatment for mental illness into chronic disease care (MIND; MR/M014290/1; £898,776)*

Integrating mental health care into primary health care services could reduce the impact of both chronic communicable and non-communicable diseases (NCDs). Like many LMICs, South Africa faces the challenge of how to reduce the high prevalence and impact of communicable diseases and NCDs, including mental disorders, for which limited services are available. Mental disorders among patients with chronic diseases are important to address as these problems are associated with poor adherence to treatment, more rapid disease progression, and treatment failure. Integrating mental health services into chronic disease care may hence be a powerful step towards improving treatment adherence and disease outcomes among people at high risk for treatment failure. However, lack of evidence about feasible, acceptable and effective ways to achieve this – with limited resources – has delayed the integration of services in South Africa.

The MIND project was funded by a full HSRI grant (Call 1) from April 2015 to March 2020. The project aimed to compare the effectiveness and cost-effectiveness of integrating different mental health care models into chronic disease services in the Western Cape Province of South Africa. It was led by Professor Bronwyn Myers (South African Medical Research Council) and included a multidisciplinary team from the University of Cape Town, Western Cape Department of Health, and University of Oxford.

MIND provided important evidence demonstrating the feasibility of training CHWs to deliver mental health care for improving chronic disease treatment outcomes. The study also developed economic evaluation methods to demonstrate the cost-effectiveness of this approach. MIND results have directly informed a policy report commissioned by the South African Department of Health to advocate for greater investment in the integration of mental health care in chronic disease services.<sup>18</sup> The study is also contributing to broader policy discussions about the role of CHWs and has supported the career development of early career researchers. Furthermore, the rural health district within the Western Cape Department of Health has requested the MIND team to develop a training programme for CHWs based on

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<sup>18</sup> Academy of Science of South Africa. Provider core competencies for improved Mental health care of the nation. 2021.



the MIND package of care. It is hoped that all CHWs in this district will be trained in the MIND intervention by the end of 2021.

#### *4.7.4 Implementing comprehensive, integrated, community-based health care for underserved, vulnerable communities in South Africa (MR/N015908/1, £669,626)*

The study was a full grant funded under Call 2 (2015) of the HSRI. The project was funded from July 2016 to February 2020. It aimed to develop an effective CHW service model that was practical, evidence-informed, sensitive to the South African context and in line with the existing South African CHW policy. The project was carried out by a multi-disciplinary team of researchers from South Africa and the UK, led by Professor Jane Goudge, University of the Witwatersrand and co-PI Professor Frances Griffiths, University of Warwick. The study team had well-established links with local health district officials. A formal project advisory group of government and health service stakeholders was set up to guide the project and generate local buy-in.

The research project consisted of two stages: First, the team conducted an observational study to compare differently structured CHW programmes that were already being implemented at six sites in Sedibeng Health District, South Africa. This uncovered differences between the CHW supervision models and showed that dedicated, experienced supervision by senior nurses, and co-location of the CHW teams with health clinics, had improved household coverage and quality of care. In the second stage, the study team developed and tested a CHW supervision model, a 'roving nurse mentor'. In this model, a senior nurse provides longer-term support to CHWs and junior supervisors, alternating between multiple sites. The study showed that the 'roving nurse' model led to an increase in the proportion of households that received a visit, from 20% pre-intervention to a sustained 30% six months after the intervention had completed, and that CHWs were delivering a much broader range of more complex tasks.

The study has added knowledge and understanding to the body of evidence that can inform and underpin health policy decisions, and the study team is planning to continue its work on CHW programmes. There are signs that policy makers are taking note: Health officials from a district neighbouring Sedibeng have expressed an interest in implementing the 'nurse mentor' model in their area. However, implementation is hampered by budget constraints and a challenging environment within the South African Health Department.

#### *4.7.5 Stakeholder monitoring to improve quality of Maternal Neonatal care in public and private sector facilities following a district health systems approach (MR/M001717/1, £98,132)*

The study was funded as a foundation grant under Call 1 of the HSRI from March 2015 until March 2017. The principal research question for the project was "to develop and test a stakeholders' monitoring tool to improve the quality of care in public and private sector emergency obstetric care (EmOC) facilities in a district in Bangladesh". The team, based in Bangladesh, was led by Dr ATM Iqbal Anwar, an expert in Maternal Health and Health Systems, with support from experts at the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b), and the Directorate General of Health Services in Bangladesh.

The project successfully demonstrated that the tool was feasible for use in Bangladesh and helped to increase competition among private health providers to improve quality of care. The tool itself was a monitoring checklist for recording quality of care and giving feedback to private health care providers. Although the tool is not in widespread use yet, the findings of the project have instigated discussion at the national level on the importance of private care providers in the health system in general and maternal and neonatal health in particular. The findings have been translated into national policy through their inclusion in the Ministry of Health



and Families National Strategy document. Furthermore, capacity was strengthened, particularly within hospitals, among health care facility managers, and key clinicians.

#### *4.7.6 Understanding the Impact of Innovations in the Regulation of Kenya's health facilities (MR/P014291/1, £387,784)*

As nations commit to achieving universal health coverage by 2030, there is a growing acknowledgement that ensuring quality of care is as important as ensuring access to health services. Regulation is a key intervention employed by governments to ensure patient safety and quality of care, but its delivery is often weak. To remedy this, it is important to evaluate regulations and regulatory reforms in the health systems arena.

The project led by Dr Francis Wafula (Strathmore University, Kenya) and Professor Catherine Goodman (LSHTM, UK) aimed at conducting a process evaluation of recent risk-based regulatory reforms introduced in Kenya in 2017 to complement the Kenya Patient Safety Impact Evaluation (KePSIE), a collaboration between the Kenyan Ministry of Health and the World Bank. Findings show that the new regulatory regime is well accepted, effective, enjoys legitimacy among stakeholders and has low potential for corruption. It has helped drive up the quality of the worst performing health facilities, thus driving up the quality of care available across the board. The findings have fed into further reforms in Kenya and are informing similar regulatory reform within the East African Community.

In addition, the study has contributed to the capacity development of four junior researchers and Kenyan stakeholders (government and regulatory bodies), increasing the research capacity and understanding of health systems research in Kenya respectively. Dr Wafula has also recently been appointed to the World Health Organization's Technical Expert Group on Regulation owing to his expertise in this area, which the HSRI-funded project has also contributed to. Consequently, findings of the project have the potential to inform health systems regulation globally.

#### *4.7.7 Investigating the determinants of health worker performance in Senegal (MR/M014681/1, £500,950)*

The project was able to leverage a large international, World Bank-sponsored programme, to study the effectiveness of Performance-Based Financing approaches. It was undertaken by a core team in London led by Dr Mylene Lagarde, in collaboration with a local partner, the Institute of Population, Development and Reproductive Health (IPDSR). This was a new collaboration which was formed when the original project partner could no longer be included. The project team continued engagement with the larger programme stakeholders, including representatives from the World Bank and national level stakeholders in Senegal.

While the study found that the financial incentives offered were largely ineffective in improving providers' performance, it pointed to a broader set of factors associated with care quality, including trust, continuity of care, overconfidence on the part of the health care providers, and the ability of patients to provide relevant information to care providers.

The study illustrates the value of 'negative' results in informing international policy debates about an increasingly common type of intervention. As such, the findings have the potential to contribute to more efficient allocation of funding towards more effective uses.

#### *4.7.8 System-Integrated Technology-Enabled Model of Care Aiming to Improve the Health of Stroke Patients in Resource-Poor Settings in China (MR/N015967/1, £505,839)*

Stroke affects millions of people, particularly in LMICs. In China, the risk of reoccurrence among stroke survivors is particularly significant, and vulnerable rural populations have limited access



to secondary prevention and rehabilitation. The System-Integrated Technology-Enabled Model of Care aiming to Improve the Health of Stroke Patients in Resource-Poor Settings in China (The “SINEMA” Study), combined innovative use of technology for training and involvement across multiple layers of local health systems with a rigorous cluster-randomised controlled trial design. The HSRI scheme was instrumental in allowing the project to take place. Positioned in the gap between small developmental studies and large multi-million global trials, the project benefitted from resources provided by the HSRI, resulting in a high-quality study.

The project achieved two main results: (1) Fidelity – The intervention was accepted by the participants and was implemented as planned, including the initial training and subsequent use of the telephone app; and (2) Patient outcomes – The intervention was found to lead to reduction in blood pressure, stroke recurrence, hospitalisation, and mortality as well as overall improvements in lifestyle. Capacity building of primary and secondary care health professionals as well as local Centres for Disease Control and Prevention was enabled through a ‘cascading training’ approach.

While the study demonstrated the effectiveness of the approach in terms of training the primary care providers and improving patient outcomes, further scale-up remains contingent on additional evidence. Therefore, the team is pursuing funding for a scale-up study in Nepal through the Joint Global Health Trials scheme and in China through government funding sources.

#### *4.7.9 Citizen-Led Accountability: Applying systems thinking to understand and strengthen health system responsiveness to marginalized communities (MR/P004555/2; £100,429)*

In many LMICs, like Guatemala, the right to health is inhibited by deficiencies in the health system. These health system failures are reflective of Guatemala’s governance environment, which is among the weakest in the region according to the World Bank’s Worldwide Governance Indicators for the period 1996–2015. Strengthening citizen-led accountability initiatives has the potential to redress the causes of health inequalities and promote better health systems governance.

The project aimed to develop a systems thinking approach to understand the function of networks in citizen-led accountability initiatives and how they contribute to health system strengthening. The study was led by Prof Ana-Karin Hurtig from Umea University in Sweden and included a multidisciplinary team from Umea University and the Centre for the Study of Equity and Governance in Health Systems (CEGSS) in Guatemala. The study team delivered the project in Guatemala and followed a qualitative comparative analysis approach, combining social network analysis (SNA), interpretive discussions and case studies to gain a deeper understanding of the change processes of citizen-led initiatives.

The study found evidence to counter the tendency to underestimate the resources and capabilities that marginalised citizens have for building power in marginalised communities. The research highlighted the importance of ‘adaptive network building’ to enable contextually embedded approaches that leverage collective power of the users of services and grass root leaders to shift the power in accountability ecosystems. The study team established a formal alliance with the national Network of Community Defenders of the Right to Health (REDC-SALUD) and the national Human Rights Ombudsman. These alliances provide citizen-led initiatives working for health rights in marginalised rural communities with greater access to mechanisms for demanding accountability for health system failures and enhanced positioning to influence policymakers.

4.7.10 *Verbal Autopsy with Participatory Action Research (VAPAR): expanding the knowledge base through partnerships for action on health equity (MR/N005597/1, £99,604; MR/P014844/1, £705,467)*

Accurate statistics form an important basis of decision making in health policy, yet for over half of all global deaths the cause is not registered. This project both sought to improve the quality of routine mortality data, and to create collaborative platforms where community and government stakeholders can work together to act upon the evidence generated through the data. The team is led by Lucia D'Ambruoso, Senior Lecturer at the University of Aberdeen, who also has affiliations with the University of Umeå, Sweden and the University Witwatersrand, South Africa. Collaborators included the South African MRC/Wits Agincourt research unit, the Department of Health of Mpumalanga province, the South African national statistics department, and WHO.

Specifically, the early stages of the research, funded through an HSRI foundation stage grant, developed the tools to add evidence on the circumstances of death (such as logistical or cultural factors associated with accessing health care) to international standard classification systems in a rural area in South Africa. Subsequently, and funded through a full HSRI grant, the project team identified community priorities for health improvement through participatory processes, co-developed an in-depth understanding of factors contributing to the identified issues (lack of clean water, and alcohol and drug abuse) and prioritised actions for different stakeholders. The project is expected to run until 2022 and if there are no disruptions, practical solutions can be expected to be implemented within the lifetime of the project. The newly established networks and learning platforms are also expected to outlast the project.

The stakeholder networks and learning platforms have already contributed to formal and informal capacity development. Community stakeholders, who engaged weekly over an extended period, have received formal certification of their participation. The cross-sectoral work has allowed the research team to build networks with government departments beyond the area of health (e.g. Department of Water and Sanitation, local municipalities). Government stakeholders have recommended incorporation of the learning platform process into routine primary healthcare planning and review.<sup>19</sup> Moreover, the process has been further adapted with local communities and health officials in the context of the COVID-19 pandemic.<sup>20</sup>

4.7.11 *Social, behavioural and economic drivers of inappropriate antibiotic use by informal private health care providers in rural India (MR/P004512/1)*

Antibiotic resistance in disease-causing bacteria is considered one of the biggest threats to global health today. To curb antibiotic resistance, it is necessary to reduce inappropriate use of antibiotics. In India, a substantial proportion of antibiotic dispensing is through informal providers despite the fact that they have no formal qualification or license to do so. The HSRI foundation grant "Social, behavioural and economic drivers of inappropriate antibiotic use by informal private health care providers in rural India" (MR/P004512/1, £99,434 over 18 months) led by Dr Meenakshi Gautham (LSHTM) supported work to identify drivers of inappropriate antibiotic use by informal providers in rural India. The study has revealed a complex set of drivers, including lack of knowledge about antibiotic resistance, economic incentives, and

<sup>19</sup> Van Der Merwe MS, D'Ambruoso L, Witter S, et al. Collective reflections on the first cycle of a collaborative learning platform to strengthen rural primary health care in Mpumalanga, South Africa. *Health Research Policy and Systems* 2021;19:66.

<sup>20</sup> [https://chwcentral.org/twg\\_article/supporting-chws-to-connect-with-communities-in-rural-south-africa-during-covid-19/](https://chwcentral.org/twg_article/supporting-chws-to-connect-with-communities-in-rural-south-africa-during-covid-19/)



marketing from pharmaceutical companies, and regulatory barriers. It has also confirmed the importance of IPs in health care provision in rural India, and described complex reciprocal relationships between formal and informal providers of health care.

The work is being continued with support of a 2019 HSRI full grant entitled “A multi-stakeholder approach towards operationalising antibiotic stewardship in India’s pluralistic rural health system” (MR/S013598/1, £766,757 over 36 months). The HSRI full grant builds on these insights and is in the process of co-developing and appraising an antibiotic stewardship intervention to reduce inappropriate use of antibiotics in humans and animals.

The research is timely as the Indian government is investing in training and legitimising informal health care providers, who are an important part of the health system in India, especially in rural communities. The work is highly relevant beyond India as informal health care provision and antibiotic over-use are common in LMICs. As a wider outcome, the project has contributed to informal health providers being included as a category in an official national survey in India.<sup>21</sup>

#### *4.7.12 Building an evidence base to support and enhance community health workers’ (informal) use of mobile phones in Ghana, Malawi and Ethiopia (MR/R003963/1, £197,472)*

The study, a foundation grant funded under Call 4 of the HSRI, was funded from January 2018 to December 2019. It aimed to build a comprehensive understanding of current ‘informal mhealth’ practices in Ghana, Malawi and Ethiopia, as a basis to informal policy and practice. The research team was led by Professor Kate Hampshire and consisted of an experienced multi-disciplinary group of researchers across seven institutions from the UK, Belgium, Ghana, Malawi and Ethiopia.

The project firstly explored what CHWs were doing with their mobile phones and how this impacted health, and secondly sought to explore the costs and benefits of doing so. The findings suggested that over 99% of CHWs in each country owned a mobile and 5% of CHW salary was being spent on mobiles. Although no health outcomes were recorded, anecdotal evidence clearly indicated that CHWs were saving lives using their mobiles in different ways. There was also a financial burden on CHWs for using their mobile phones along with unexpected emotional costs because CHWs felt they needed to be available for their patients all the time.

There has been positive feedback on the national level findings from the Ministries of Health in all three countries. The project also contributed to capacity development of the project team, with several junior members attending a writing workshop. Consequently, a number of first author publications are due from team members who had never previously written an academic article. In all 12 papers have been drafted focussing on different aspects of the study in each of the three countries.

#### *4.7.13 Guideline Adherence in Slums Project – Template-based documentation and decision support for primary health care clinics in the private sector (MR/N005015/1, £97,921)*

Health care in urban low-resource settings in Kenya is often provided by staff not trained as medical doctors and with little support to improve quality of care. The project in question conducted exploratory research into the challenges associated with adhering to clinical guidelines, and tested the usability, acceptability, and effectiveness of simple templates to

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<sup>21</sup> <http://mospi.nic.in/NSSOa>



enhance guideline adherence. It was led by Pratap Kumar (Strathmore University Business School, Kenya) who is also the founder and CEO of Health-E-Net Limited, a Kenyan health-tech company.<sup>22</sup>

The team worked with 9 private health care facilities in slums in Nairobi, Kenya. Building on previously developed prototypes, they equipped each facility with customised templates that are highly practical to use within the usual clinical workflow but also easily digitisable using ubiquitous smartphone technology. Templates serve as decision support as well as documentation tools and data were discussed with each facility on a monthly basis. Researchers were able to show that template use improved information documentation in pre/post comparison and altered clinician behaviour to some extent. The team see widespread applicability of this simple technology and are currently applying similar ideas in optimising blood transfusion systems in Kenya funded by the US NIH. The technology is also being used by World Friends,<sup>23</sup> an NGO providing health services in socially disadvantaged areas in Kenya, and similar groups in other countries. The work has also been discussed at the Global Symposium on Health Systems Research in 2018 and 2020, and the team has engaged with health care practitioners. The PI is also a social entrepreneur, which he sees as an important enabler in driving the practical application and implementation of the technology.

#### *4.7.14 Building resilient health systems: lessons from international, national and local emergency responses to the Ebola epidemic in Sierra Leone (Ebola Gbalo, MR/N015754/1, £498,000)*

The Ebola Gbalo project was funded as a full award in call 2 of the HSRI. It started in January 2016 and ran for 3 years. The project was led by Prof. Susannah Mayhew (LSHTM) and was jointly developed with Njala University in Sierra Leone, where the project contributed to the training of three PhD students.

Sierra Leone is one of the poorest countries in the world with a very weak health system. It suffered an epidemic of Ebola (2014-2016) which the existing health system was unable to respond to effectively. The Ebola Gbalo project studied the response to the epidemic in two districts in Sierra Leone on the local and national levels and how these districts interacted with international agencies. It documented local, informal community learning and responsiveness to the Ebola epidemic and uncovered reasons for opposing top-down measures put in place by the national government and international agencies. The project findings emphasised the need to develop measures to fight an epidemic in a collaborative way to ensure buy-in from the population. The project findings, alongside other learnings from the Ebola outbreak, have contributed to Sierra Leone's response to COVID-19. The project has also raised awareness of potential unintended consequences of international interventions, and informed the response to Ebola in the Democratic Republic of Congo.

#### *4.7.15 Determinants of medical equipment performance to improve management capacity within the health system in Vietnam (MR/M002306/1; £115,295)*

This project was a foundation grant funded under Call 1 of the HSRI from March 2015 to March 2017. It aimed to understand the extent to which Vietnamese hospitals follow international Health Technology Management (HTM) guidelines and recommendations. It had a particular

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<sup>22</sup> <http://www.health-e-net.org>

<sup>23</sup> <https://www.world-friends.it/en/>



focus on identifying the determinants affecting medical equipment performance. The study also aimed to develop education and training interventions to improve HTM.

The project was led by Dr Nguyen Thanh Huong, Associate Professor at Hanoi University of Public Health, supported by two co-investigators, and delivered in close collaboration with the Vietnamese Ministry of Health, Swiss Tropical & Public Health Institute, Provincial Health Departments, and 6 central hospitals from Hanoi and Ho Chi Minh city.

The study provided the first evidence on the determinants affecting medical equipment management in Vietnam. The study findings informed a health policy issued by the Vietnamese government on the management of medical devices (Decree No. 36/2016/ND-CPD). The policy made recommendations for changes within hospitals and the regulatory framework of the Ministry of Health to improve HTM and the quality of health care services provided in Vietnam. The study also provided evidence to develop new training material on effective HTM for a master's course in hospital management and short courses for health professionals.

#### 4.8 Value for money

The HSRI represents value for money (VfM) in a variety of ways, maximising the impact of the investment.

##### 4.8.1 Partnership of funders

Delivery of the HSRI through a partnership of funders represents added value for both funders and applicants by:

- **Reducing duplication of effort.** A unified review process avoids unnecessary time investment by researchers in submitting proposals to multiple schemes and avoids duplication of effort by review panels. Efficiencies are also achieved through centralised scheme management. Moreover, the costs for these are covered by the Wellcome Trust and MRC respectively representing efficiency gains
- **Pooling of budgets,** reducing the risk of investment for individual funders and making a larger pot of funding available for research
- **Pooling of expertise and networks,** allowing funders to draw on these to inform the development of the call of proposals, review process, and scheme management. For instance, the ESRC's expertise in social sciences has ensured that the calls are appropriate for social scientists and the funding committee includes high quality social sciences expertise. FCDO brings its LMIC expertise, while the Wellcome Trust and MRC bring the research commissioning and research management expertise respectively

All key opinion leaders agreed with these points when asked about aspects that contribute to the scheme's VfM and how delivering the scheme as a partnership of funders adds value.

##### 4.8.2 Filling a gap in the wider global health research landscape

Almost all stakeholders consulted in this study agree that the HSRI addresses a crucial gap in the global health funding landscape. It is one of the only funding programmes which specifically funds HPSR – a crucial area which often falls between other funding programmes.

##### 4.8.3 Funding for high-quality research with strong relevance to LMIC needs

All key opinion leaders and funding committee members agreed that the HSRI has the potential to help UK's efforts to achieve the health-related Sustainable Development Goals. Strong stakeholder engagement and involvement in the design and implementation of most HSRI projects ensures relevance to LMIC health system needs and buy in for the findings, making it



more likely that they will contribute to policy and health system changes that will be of value to LMIC populations.

#### 4.8.4 *Availability of foundation grants*

Foundation grants offer researchers the option to apply for smaller amounts for funding to do exploratory research or pilot studies, which allows more efficient use of the limited resources available, avoiding excessive research effort and reducing the risk to funders. This way, there is potential to fund diverse research ideas as well as early career researchers in order to ultimately seed higher value projects and build research leadership in HPSR.

#### 4.8.5 *Potential value for money for health systems in LMICs*

HSRI projects also contribute evidence on financial interventions or costs of delivering an intervention. For instance, a project focussed on Performance-Based Financing (PBF) in Senegal showed that the financial incentive was not effective. Another project identified models for decentralised DR-TB care in South Africa. If adopted, the models would reduce the need for patients to travel frequently and for hospitals to maintain isolation wards and personnel to deliver care in these specially built wards, thus reducing the resource burden for both patients and the health system. By highlighting such inefficiencies, HSRI findings can ultimately contribute to better use of available funds, and thus value for money for the relevant health system.

#### 4.8.6 *Capacity development and leverage of additional resources*

HSRI-funded research has led to enhanced scientific knowledge which has been used for further work, and to new people being trained and new skills being acquired, strengthening HPSR capacity in LMICs and HICs. This has also helped to leverage further funding and resources for HPSR (see Section 4.5.2).

#### 4.8.7 *Flexible scheme management*

Flexibility in scheme management contributes to VfM for the research budget by allowing no-cost extensions and reorientation of research (e.g. in a project where the national programme being evaluated was withdrawn), facilitating completion of projects and subsequent impact. This has been particularly valuable during the COVID-19 pandemic when many LMIC team members – researchers, policy makers and practitioners – have been seconded onto helping with the pandemic response.

#### 4.8.8 *Opportunities to improve VfM*

There are a number of potential opportunities to improve the scheme's VfM, for instance:

- While researchers appreciated the 'light-touch' reporting requirements of the scheme, additional monitoring would enhance the funders' ability to track outcomes and impacts, understand if the stakeholder engagement and pathway to impact are being realised as promised in the proposal, and pinpoint opportunities for sharing learning more widely to optimise the value derived from funded research
- Funders could support targeted dissemination and engagement activities with decision makers and users to ensure full pull-through of research findings to policy and implementation. This could include networking activities with HSRI-funded researchers to facilitate knowledge exchange and synergy across HSRI projects, especially those in similar areas
- One key opinion leader suggested that in light of the SDGs, LMICs are heavily investing in health system innovations and related research e.g. India's Ayushman Bharat programme



to achieve UHC.<sup>24</sup> The HSRI funders could consider partnering with LMIC funders to further ensure relevance and buy-in for HPSR

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<sup>24</sup> <https://pmjay.gov.in/about/pmjay>

## 5 HSRI and the Global Health Research Landscape

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### 5.1 Development of the field of health systems research

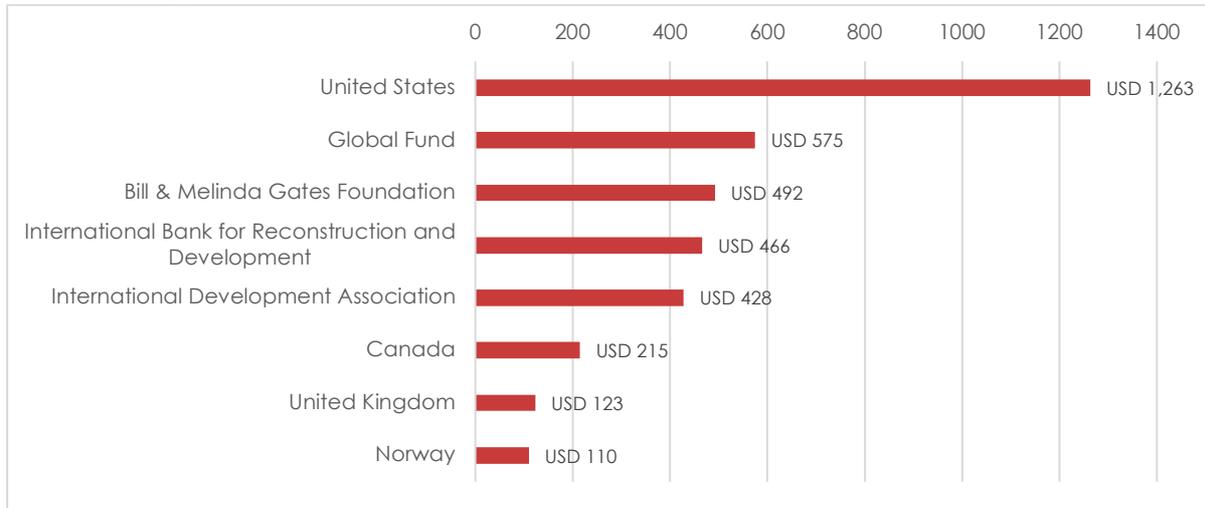
Over the past 15-20 years, global health organisations have increased their focus on HPSR. While the bulk of attention centred on disease-specific ventures from the mid-1990s to mid-2000s, including the establishment of the Global Alliance for Vaccines and Immunizations (GAVI, established in 2000), the Global Fund (2002) and the US President's Emergency Plan for AIDS Relief (PEPFAR, established in 2003), health systems emerged as a key component in the successful implementation of these programmes (Hafner and Shiffman, 2013; Bennett, Frenk and Mills, 2018). This led to a growing recognition that the targets set by the Millennium Development Goals (MDGs) would not be achieved without better health systems.

As a result, the global health agenda started to shift from an emphasis on disease-specific approaches to a focus on strengthening of health systems, including in discussions at a range of high-level policy fora (e.g. 2008 G8 summit in Japan) (Reich and Takemi, 2009; Hafner and Shiffman, 2013; Yao *et al.*, 2014), and through the launch of major health systems strengthening efforts ('horizontal') as part of disease-focussed 'vertical' programmes (e.g. GAVI, Global Fund) – albeit not without controversy (Storeng, 2014; Tsai, Lee and Fan, 2016). This was accompanied by a shift from disease or service-specific ways of viewing health services in LMICs towards a more integrated and systems-focused perspective, with universal health coverage (UHC) becoming a focal point for action (Bennett, Frenk and Mills, 2018). Thus, while the MDGs targeted specific health outcomes, the 2015 Sustainable Development Goals (SDGs) included UHC as a commitment (Rajan *et al.*, 2020).

The increased focus on health systems also led to a growing recognition of the role of research in improving health systems and health care delivery (Remme *et al.*, 2010; Bennett, Frenk and Mills, 2018). The establishment of the AHPSR in 1999, as a partnership hosted by the WHO, marked an important milestone.

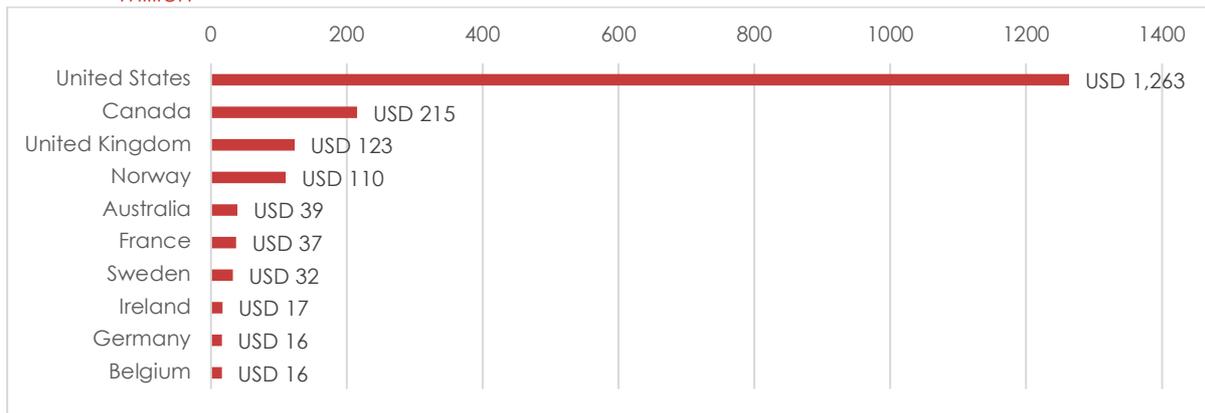
In line with these developments, funding of HPSR-related activities has increased since 2000 (Grépin *et al.*, 2017). Applying the AHPSR's definition for HPSR, an analysis of the OECD's Creditor Reporting System, which aggregates annual transaction-level data on official development assistance (ODA) projects supported by bilateral aid agencies, multilateral donors, and private sources such as charities estimated that the total commitment to HPSR-related activities amounted to USD4 billion between 2000 and 2014. Commitments increased from 2000 to 2011 from below USD100 million to a peak of USD 540 million in 2010, and held at around USD400 million from 2011 to 2014. The majority of funding, 93%, originated with ten donors, with countries in the sub-Saharan African region the major recipients of HPSR funding.

Figure 26 Donors of health policy and systems research funding >USD100 million (2000-2014), in USD million



Source: Adapted from (Grépin *et al.*, 2017)

Figure 27 Top 10 bilateral donors of health policy and systems research funding (2000-2014), in USD million



Source: Adapted from (Grépin *et al.*, 2017)

A number of bibliometric studies confirm a rise in HPSR publication output, mirroring the rise in investment (Yao *et al.*, 2014; English and Pourbohloul, 2017b).

## 5.2 HPSR funding – organisations and programmes

Funders of HPSR include different types of organisations, such as government research funding bodies (e.g. NWO, NIHR), aid agencies (e.g. USAID, Norad, Sida), as well as charitable foundations (e.g. Doris Duke Foundation, Bill & Melinda Gates Foundation). This section provides a brief introduction to some of the main HPSR activities and programmes funded by these funders, followed by a short summary of their monitoring activity. A longer description of HPSR funders, the programmes they fund and their monitoring processes and indicators are included in Appendix D.

We also analysed grants that mapped to HRC research activity code 8, to identify the top 10 funders of health systems research with relevance to LMICs (see Appendix D). Our results show that most of these are based in HICs, e.g. the European Union, the UK and the United States, although this may in part reflect the fact that funders from LMICs are less likely to be

represented on the Dimensions database. Major funders from MICs include the National Natural Science Foundation of China, the National Council for Scientific and Technological Development (Brazil), and São Paulo Research Foundation (Brazil). The data further suggests that large parts of research funding from HICs are focussed on a small number of (predominantly anglophone) LMIC countries such as South Africa, Zambia, China, Uganda and India, with the top 10 countries of focus accounting for 62% of the research.

### 5.3 Funding programmes relevant to HPSR

#### 5.3.1 Introduction

Health systems research addresses questions that affect some or all of the building blocks of a health system ('horizontal' approach), rather than focussing on how a specific disease is addressed in a given health system ('vertical'). However, delivery partnerships, such as the Global Fund and the GAVI Alliance (see Appendix D) and research programmes focussed on specific disease interventions or technologies, such as the Global Alliance for Chronic Diseases<sup>25</sup>, and the Norwegian Research Council's Globvac programme<sup>26</sup>, often include research relevant to the implementation of interventions and to health systems.

Support for this type of research is often complex and perhaps as a consequence, often undertaken by partnerships and alliances rather than by individual funding bodies on their own, and with a strong emphasis on local stakeholder engagement and take-up.

Table 11 provides an overview of four programmes with a focus on HPSR, as well as one 'vertical' partnership (the GAVI Alliance) and summarises their key features. A fuller description is provided in Appendix D.

Some funders, including those supporting the HSRI - also support HPSR as part of other initiatives. For example, DFID (now FCDO) has funded a number of consortia focussed on health systems in the past, including the Future Health Systems consortium (2005-2018)<sup>27</sup>, the ReBUILD consortium (2011-2019)<sup>28</sup>, and the RESYST consortium (2010-2018) which was preceded by Consortium for Research on Equitable Health Systems from 2005 to 2010<sup>29</sup>.

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<sup>25</sup> <https://www.gaccd.org> Accessed 23 Nov 2020

<sup>26</sup> <https://www.forskningsradet.no/siteassets/publikasjoner/1254031414810.pdf> Accessed 23 Nov 2020

<sup>27</sup> <http://www.futurehealthsystems.org> Accessed 23 Nov 2020

<sup>28</sup> <https://rebuildconsortium.com/about/about-the-rebuild-consortium/> Accessed 23 Nov 2020

<sup>29</sup> <https://resyst.lshtm.ac.uk/about> Accessed 23 Nov 2020



Table 11 Overview of HPSR research programmes

Funder	Programme/s (if relevant)	Funding modality	Level of funding	Objectives	Types of activities funded	Eligible locations	
						For PI	For implementation
Doris Duke	African Health Initiative – Phase 1: Population Health Implementation & Training (PHIT) Partnerships	Open call for letters of interest Restricted call for proposals	\$60m (5-7 years)	measurable health improvements strengthen health systems to sustain improvements increase the knowledge for evidence-based health delivery	Proof-of-concept projects	US	Sub-Saharan Africa
	African Health Initiative – Phase 2 (2016-2022): Learning, Engaging and Advocating for Policy and Systems research (LEAP) Forum for Health Systems Strengthening (HSS)	Invitation only	3 grants totaling \$22m (5-6 years)	Improve maternal and neonatal survival and well-being	Large-scale health system strengthening partnerships Global communications platform	US	Sub-Saharan Africa
NWO-WOTRO (NL)	Netherlands Global Health Policy and Health Systems Research (GPHSR)	Calls for proposals (three rounds)	€7.32m in total over three rounds.	Contribute to better health Strengthen research capacity in LICs Strengthening collaboration in Dutch GPHSR community	Multi/Transdisciplinary research projects (Round 1-2) Facilitations of network of research coalitions funded (Round 3)	NL	LICs in Africa
NIHR	Global Health Policy and Systems Research (HPSR)	Calls for proposals Development awards	£1m call budget  Up to £100k per award (9 months)	develop partnerships between researchers in LMICs and the UK to support an application for future funding	stakeholder engagement assessment of local needs	LMIC & UK joint lead applicants required.	LMICs



		Commissioned awards	Grants pp to £4m for up to 4 years	Equitable partnerships between LMIC and UK researchers New research knowledge to tackle priorities for health systems strengthening	Applied health research	LMIC & UK joint lead applicants required.	LMICs
		Researcher-led awards	(tbc)	research consortia to deliver research to improve whole health systems and health services for people in LMICs	(tbc)	(tbc)	LMICs
WHO / NORAD / Sida / UK Aid / Gates	Alliance for Health Policy and Systems Research (AHPSR)	Multiple	\$7-10m per year budget for Alliance	Provide a forum for the research community Support institutional capacity Stimulate the generation of knowledge and innovations Increase the demand for and use of knowledge	E.g. Policy coordination Research synthesis (systematic reviews) Implementation research	(varies)	(varies)
Gates Foundation, WHO, UNICEF, World Bank	Global Alliance for Vaccines and Immunisation (GAVI) – Health Systems Strengthening	Formula-based allocation	\$331m (2019)	extend immunisation services to under-immunised and zero-dose children to build a stronger primary health care platform ensure immunisation services are well-managed build resilient demand, and identify and address gender related barriers to immunisation	Investments towards country-specific needs Human resources Promote long-term sustainability (cannot be used for vaccines and consumables)	Low-income countries*  *) calculated according to GNI	Technical assistance by Gavi partners according to Partners' Engagement Framework (PEF)

## 5.4 Impact indicator frameworks and monitoring processes employed for HPSR

Measuring impact on complex systems, such as health systems, is challenging given the many actors, contextual factors and external influences, and long timeframes involved.

A review of indicators frameworks and metrics of HPSR research funding programmes found that monitoring processes employed 'traditional' indicators, i.e. those related to activities undertaken and research publications. Where additional evaluation was available, these tended to be conducted externally, at one or more points during programme implementation.

On the other hand, two programmes – the Doris Duke AHI and GAVI – employed a detailed set of health indicators. These are specific to health issues and patient populations targeted by the initiatives, rather than measuring impacts on the health system as a whole.

Appendix D provides a brief overview of approaches to monitoring and evaluation of five programmes, which are summarised in Table 12 below.

*Table 12 Monitoring and indicators of HPSR programmes*

<b>Funder/ Programme</b>	<b>Type of evaluation / monitoring (year, if applicable)</b>	<b>Indicator types</b>	<b>Examples of indicators</b>
Netherlands Global Health Policy and Health Systems Research (GPHSR)	Annual project reporting Mid-term report (2016) External programme evaluation (2018)	Process, Output, impact	(Mostly qualitative) Scientific publications, presentations, conferences PhD students funded/completed
Global Health Policy and Systems Research (HPSR)	Annual project reporting, incl. for five years post award [unknown whether additional reporting requirements]	Output, impact	Researchfish® (e.g. publications, collaborations, further funding, policy impact)
Alliance for Health Policy and Systems Research (AHPSR)	Annual reports External evaluation (2010, 2014, forthcoming)	Process, Output, Impact	Networks supported Presentations / webinars / meetings Journal articles published Communications (twitter followers / website sessions)
Doris Duke African Health initiative	Self-monitoring	Output impact,	Child mortality Coverage of services Equity
GAVI Health Systems Strengthening (HSS)	Monitoring: Grant Performance Framework (GPF) Evaluations and reviews: GAVI health Systems Strengthening Support Evaluation (2009) Evaluations of individual countries' HSS grants Meta-review of HSS grants (2015, 2018) Review of HSS Support (2019)	Process, Output	Supply chain performance Data quality Coverage with a first dose of pentavalent vaccine and the drop- out rate between the first and third dose in countries we support Integrated health service delivery Civil society engagement

#### 5.4.1 Challenges for HPSR

The literature review identified number of (often interrelated) challenges to planning, implementing and evaluating HPSR projects. These include:

**Assessing effectiveness in complex health systems**, including the broad range of actors and long timeframes involved: Implementing interventions can be challenging, as this may involve complex changes in clinical routines in collaborative patterns among different health care providers and disciplines; in the behaviour of providers, patients or other stakeholders; or in the organisation of care (Pantoja *et al.*, 2017). In addition, health systems operate in broader contexts that are strongly influenced by individuals, as well as broader social, political, and economic settings (Sheikh, George and Gilson, 2014). These complex and changing environments make it difficult or impossible to robustly assess effectiveness of an intervention and to find suitable comparison areas (Hatt *et al.*, 2015). In addition, linking health systems strengthening interventions to health outcomes is hampered by the longer time horizon for effects of some systems-level interventions to be observed, and measured, and by potential interaction with other interventions implemented within this timeframe. For example, an evaluation of a programme supporting primary health care delivery systems concluded that “variety and inclusiveness of concerned key players are necessary to address complex health system issues at all levels” and that “five to seven years is the minimum time frame necessary to effectively implement complex health system strengthening interventions and generate the evidence base needed to advocate for sustainable change” (Rwabukwisi *et al.*, 2017).

**Context-specificity of research findings and recommended interventions:** It can be difficult to draw generalisable conclusions from HPSR studies conducted in one country, at a specific point in time; what works in one setting and time might not work elsewhere (Alliance for Health Policy and Systems Research, 2007). In addition to existing ‘external’ conditions, contextual influences also affect the daily practice of health systems through the experiences, mindsets, and values that shape the behaviours of the actors within it (Sheikh, George and Gilson, 2014). To address these issues and disentangle the effects of context, comparative studies in multiple locations are needed. However, knowledge is unlikely to be broadly generalisable; interventions need to be adapted to different contexts, requiring monitoring and iteration. Thus, countries need their own analytical capacity to trace health system changes and adapt interventions as needed (Bennett, Frenk and Mills, 2018).

**Gaps in HPSR activity:** A study examining the characteristics of 791 implementation research in LMICs over the 1998 to 2016 period found that less than 5% of the less than 5% of studies addressed problems of scale-up and sustainability of interventions, highlighting a gap in research activity (Alonge *et al.*, 2019). This highlights a disconnect between supply and demand: Whereas most studies centred on evaluation of an intervention, key implementation questions in most settings are concerned with how to scale up or sustain an intervention within a practice area or population. In addition, the analysis found that most studies had *not* been conducted under routine conditions for management and financing. This limits the extent to which learning can be applied to commonly found conditions and reduces the level to which findings can ‘flow’ into the health system and/or routine practice. A bibliometric analysis of HPSR publications published between 2003 and 2009 showed that a small share of studies had addressed the areas ‘Medicines’ (1.8%) and ‘Health information systems’ (5.3%) (Adam *et al.*, 2011). An evidence review of ‘What works for health systems strengthening’ found that there is a substantial body of evidence on service delivery and financing, but very little on health information and supply chain management (Witter *et al.*, 2019).

**A lack of data for LMICs in areas contributing to HPSR:** The current evidence base and/or routine data gathered which informs HPSR in HIC is not available for many LMICs. For example, little is

known about the quality of care for a range of indications, such as respiratory diseases, cancer, mental health, injuries, and surgery, and some patient groups, such as care of adolescents and elderly people (Kruk, Gage, Arsenault, *et al.*, 2018). To fill these gaps requires better routine health information systems for monitoring as well as research on system-wide improvement strategies, evaluating the effects and costs of improvement approaches on health, patient experience, and financial protection. Other knowledge gaps with respect to low-income country contexts include the area of social values, with a limited level of empirical work focussing on this area (Whyte and Olivier, 2020).

**Perceived lack of rigour of HPSR:** Health scientists and physicians schooled in discovery science are less comfortable with methods used in HPSR, which employ a range of social science approaches in order to probe questions dealing with the complexity of health systems as well as contextual factors (Alliance for Health Policy and Systems Research, 2007). This can affect trust in HPSR and motivations to participate and/or act on findings.

Tight projects budgets may also affect the level of rigor and 'generalisability' of HPSR, e.g. with study budget only stretching to accommodate single case studies (Alliance for Health Policy and Systems Research, 2007).

**Lack of funding for HPSR:** To date, HPSR has received a relatively low level of support compared to other types of health research. In 2014, the NIH invested close to USD30 billion in medical research, an amount close to 70 times the estimated for all donor HPSR funding in that same year (Grépin *et al.*, 2017). Research institutions and stakeholders highlight limited research funding as a key challenge to HPSR (Uzochukwu, Mbachu, *et al.*, 2016; Uzochukwu, Onwujekwe, *et al.*, 2016; Shroff *et al.*, 2017). This view was echoed by almost all of the key opinion leaders interviewed for this study.

## 5.5 HSRI in the global funding landscape

Consultees broadly agreed that the HSRI is addressing a need in the funding landscape (almost all PIs, key opinion leaders and a majority of co-Is and unsuccessful applicants). Its unique role as a programme dedicated to HPSR was highlighted, with most funders focussing on clinical research. As one PI explained: "Issues addressed by HSRI research represent the diversity and the complexity of global health. I'm not sure other funders would support something like this, whether they would see the importance of these issues."; another PI commented: "As a clinician and a public health care worker, I find the work that has been done to be tremendously useful and helpful. And if it wasn't funded by this initiative, it wouldn't have been conducted."

### 5.5.1 Comparison with other funding sources

When asked about other similar sources of funding for HPSR, interviewees largely agreed that there is no direct comparator to the HSRI. They described that other schemes may include HPSR aspects as part of research projects, but tend to be geared towards clinical research and/or have a narrower scope, e.g. a focus on specific diseases or on capacity building. Examples of other funders in this space provided were the NIHR (5 PIs); Wellcome (e.g. JIREP) (3); and GCRF, GACD, FCDO Research Programme Consortia, and USAID (1, each)<sup>30</sup>. Each funder had a caveat associated: The NIHR was described a "starting out" in global health, with one PI commenting that they preferred the HSRI option of applying for smaller project grants. Disadvantages of other funders/funding schemes included that the GACD does not allow LMIC

<sup>30</sup> JIREP: Joint Initiative on Research in Epidemic Preparedness and Response; GCRF: Global Challenge Research Fund; GACD: Global Alliance for Chronic Diseases; DfID: Department for International Development, now FCDO

leadership, that FCDO's Programme Consortia are associated with a heavy bureaucratic burden, that other Wellcome schemes tend to have more of a clinical focus, and that USAID requires annual budget approvals making sustained work difficult. The only advantage of other schemes mentioned was a larger grant size (GCRF, NIHR). On the other hand, the AHPSR which specifically funds HPSR like HSRI only funds LMICs and not HIC researchers, plus the funds available are much smaller.

At the same time, six PIs stressed that the HSRI is a very competitive scheme, with many more high-quality proposals than budget available, and that the level of funding for HPSR, and for capacity strengthening in this area, continues to be insufficient. As one PI from an LMIC summarised: "There's not a scheme like this [the HSRI] anywhere else in the world. The UK can't really take on this job on its own. But it is a crucial part of research that needs to be done."

### 5.5.2 Strengths and weaknesses of the HSRI

The main strength of the HSRI according to a vast majority of consultees is that it is one of the only funding programmes which is designed around health systems research – a crucial area which often falls between other funding programmes (Table 13). Moreover, now that it is a fairly established scheme, HPSR researchers can prepare for proposals in much advance e.g. identifying and building relationships with new partners and jointly developing ideas for proposals. The main weakness however is that the overall amount of funding available for the scheme is relatively small resulting in high competition and many high-quality proposals not getting funded.

*Table 13 Strengths and weaknesses of the HSRI according to funded researchers*

Strengths (n)	Weaknesses (n)
Funding specifically allocated to health systems research (10 PIs, 20 co-Is)	Relatively small funds (6 PIs, 4 co-Is)
Focus on LMICs, including allowing LMIC researchers to be PIs on projects, funding in challenging contexts such as Syria, promoting equitable partnership with institutions in LMICs (5 PIs, 4 co-Is)	High competition, resulting in many high-quality fundable projects not awarded funding (4 PIs)
An all-inclusive approach, that is open to innovation, social science research and multi-/inter-disciplinarity (6 PIs, 21 co-Is)	Criteria for selection seem to require a methodologically novel, policy-relevant proposal with a prominent theoretical element, creating some tension (1 PI); focuses on research rather than translation or implementation of research (3 co-Is)
Focus on policy-relevant and impactful research, including encouraging knowledge and skill exchange between and among researchers and stakeholders (4 PIs, 4 co-Is)	No feedback for unsuccessful applications makes it difficult to improve (1 PI, 2 co-Is)
Strengthens research capacity in LMICs (also HICs) (2 PIs)	Low success rate of proposals led by LMIC-based researchers (1 PI)
Low burden monitoring requirements, excellent application guidelines with detailed/comprehensive information (1 PI)	Scope could be wider (1 PI, 2 co-Is)
Significant funding for projects (1 PI)	Does not fund PhD/MSc students (2 co-Is)
Decisions made by committees that understand health systems research (1 PI)	Lack of follow-on funding (2 co-Is)

Source: Technopolis analysis of PI and co-I surveys



According to unsuccessful applicants, the HSRI's strengths include the specific focus on health systems (10) and multidisciplinary research (2). Weaknesses included the length of the application, which could be shorter (2) and feedback, which could be improved (3). Two respondents mentioned it was difficult to balance budgets between UK and LMIC partners.

## 5.6 Gaps in the HPSR funding landscape

67% of PI survey respondents (16 of 24) felt that critical gaps remain in the HPSR funding landscape and act as a barrier to impact. Eleven of the 16 PIs (69%) and 14 of 41 co-Is (34%) who provided further comments pointed to the lack of sufficient funding for HPSR as the major barrier to capacity development and impact. While the HSRI has made an important contribution in addressing an important gap, the need for such research and research funding is much more than is currently available through the HSRI. A related problem is the lack of funding from local national institutions, including governments, in most LMICs, which makes it difficult for researchers to build and sustain HPSR research capacity in LMIC institutions. Other identified gaps include lack of support for follow-on impact and engagement activities with policy makers and users, and lesser focus on research related to implementation, quality of care, and efficiency improvements.

Beyond a general lack of funding for HPSR, a number of specific gaps were identified in the consultations as well:

- Support for follow-on impact and engagement activities with policy makers and users
- Research *accompanying* implementation of health system interventions over a longer period of time (in addition to current outcomes evaluation following implementation)
- Qualitative and social science research
- Research related to implementation, quality of care, and efficiency improvements
- Evidence synthesis
- HPSR involving the private sector / private sector innovations in the health system

## 6 HSRI design and management

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### 6.1 The design of the HSRI

#### 6.1.1 Key design features

Interviewees highlighted a number of aspects in the design of the HSRI which make it stand out from other funding schemes:

- **Exploratory research and range of methodologies funded**

Several PIs (7) welcomed the HSRI's openness to funding exploratory research and a broad range of methodologies. Other funders were described as focussed on trial methodology, anchored in clinical research. RCTs often do not fit the needs of HPSR, an interdisciplinary research field which tends to "use different methods from across different fields". As a result, researchers described difficulties when seeking funding through other schemes (e.g., "Sometimes we are a square peg trying to fit into a round hole."). The HSRI open and flexible approach was seen to enable creativity and innovation (2), and real interdisciplinarity (3).

In this context, PIs (6) also highlighted the opportunity provided by foundation grants to conduct exploratory (and potentially riskier) research. As one PI commented: "I love the availability of the two-tier model of the smaller foundation grants and the bigger full grants. I think it's an opportunity for someone to test whether this is something that is researchable at a large scale. And sometimes it isn't. And even that is a finding on its own, so I think it's great."

- **Breadth of scope**

Six PIs commented positively on the HSRI's broad scope, giving researchers flexibility in which research questions they address. One PI commented that there is a temptation for funders to narrow down ("go vertical") in order to demonstrate outcomes from the programme, but advised to maintain the breadth of HSRI research.

- **Capacity development and opportunity for LMIC leadership**

Several PIs (6) welcomed that the HSRI includes capacity development within its objectives. One commented that the scheme is an important avenue by supporting 'on-the-job' learning: "It [the HSRI] allows the building of capacity of local researchers on the job through involving them at every stage of the design of the field work and of the analysis and interpretation. Because that's how they really build their skills. A week's training workshop isn't going to do it."

Other PIs (4) pointed specifically to foundation grants as important opportunities for capacity building, allowing junior PIs to learn by leading a smaller project. One PI from an LMIC explained: "If I didn't have that first exploratory grant, I would have perhaps moved on from academia. That exploratory grant gave me a foothold, which has allowed me to keep expanding my research." However, another PI felt that there was a need for clarity on the aim of foundation grants, i.e. whether funding decisions focus on capacity building or on exploratory research.

Several PIs (4) also pointed out that the HSRI is unusual among schemes in funding LMIC researchers without the requirement for a UK partner. This was seen to have a positive effect on both, capacity building and project design. As one PI explained: "I was so impressed that the UK are funding projects without a UK partner. [...], to actually have the PIs in LMICs able to connect to others the way they find most strategic and useful and not bind the project to UK collaboration."

### 6.1.2 Overall impressions of the design

77% of PIs (20 of 26) who responded to the survey were satisfied with the scheme's design and requirements. The HSRI's design and requirements were largely seen as conducive to attracting relevant high-quality proposals (75%, 18 of 24 PIs). Five PIs (21%) felt that there are certain aspects that function as a barrier for LMIC researchers, while one PI (4%) felt that some aspects are a barrier for HIC researchers. The latter highlighted that PIs affiliated with UK institutions but based overseas should be able to apply as PI. LMIC researchers pointed to barriers such as difficulty in finding HIC partners, low success rate even for high quality proposals which may discourage researchers from applying again, and reviewers unable to link one service improvement to system change.

The majority of Co-Is were satisfied with the scheme's design and requirements, and felt that nothing needed to be improved (87%, 82 out of 94). In contrast, unsuccessful applicants' opinions about the scheme design and requirements were mixed; 51% (18 of 35) of respondents felt there were aspects that were problematic and could be improved and 49% (17 of 35) of respondents did not consider any aspects or requirements problematic. Of the respondents that felt there were problematic aspects, the problems lay with application requirements as described in Section 6.1.3 below.

Funding committee members provided further contextual and historical details of the programme's design. They felt that the fact that LMIC needs and collaboration between UK and LMIC researchers is central to the scheme is particularly positive. Further, the emphasis placed on the quality of the applications right from the start of the scheme was important; however, this meant that in the initial rounds, the same handful of institutions that had the relevant HPSR capacity to produce high quality proposals were largely successful. Additionally, while the so-called 'development' grants were initially conceptualised as preparatory grants to build a full grant from, the expected level of continuity between the two grant types did not materialise. Hence the change to 'foundation' grants which have a broader remit and wherein researchers are encouraged to undertake exploratory research regardless of whether it can be eventually be built up to a full grant proposal.

One funding committee member felt that foundation grants were "easier pickings" for LMIC research groups and an "entry point" for "unlikely" applicants such as social scientists or political scientists (as opposed to "likely" applicants who are multidisciplinary researchers working in the public health or global health area), and thus had to some extent helped redistribute funds in a positive way and bring a more diverse set of perspectives to the HPSR field. However, one PI felt that the period for the foundation grants is too short and researchers have to be ambitious to get enough evidence to support a larger follow-on grant proposal.

### 6.1.3 Size of the awards

When asked about the size of HSRI grant, three PIs commented that the budget provided was appropriate to cover research costs. Two of these PIs specifically welcomed that the HSRI offers grants of variable size, preferring medium-sizes and smaller grants to very large grants. However, another PI considered project budgets available too small, especially for delivery of multi-country projects.

### 6.1.4 The application process

Awardees were largely satisfied with the application requirements. Critical comments were made on some aspects as follows

- The application form is somewhat repetitive, especially in sections concerning impact (one funding committee member agreed with this point). While this has improved in recent calls, the problem has not been solved completely.
- There is a tension between the amount of funding that can be requested and the level of ambition expected in the proposal. In one particular instance, this meant that less post-doctoral time and travel budget was costed in the proposal than required
- Feedback for unsuccessful applications could be improved, particularly to help LMIC researchers improve their future grant applications

Five unsuccessful applicants reported the guidance on remit and criteria could be clearer and three reported the application requirements could be simplified e.g. there were duplications around describing pathways to impact and it took too much time to complete the additional material required. Two respondents reported it was difficult to secure letters of support during the COVID-19 pandemic.

Most of the unsuccessful applicants (65%, n=26) reported receiving feedback on their application and a large proportion (39%) felt that the feedback was somewhat helpful. However, some applicants mentioned receiving feedback that was contradictory (3), very generic or without actionable changes.

#### 6.1.5 Administrative processes

Interviewees were generally positive about how the HSRI is being implemented, with PIs highlighting clear and helpful feedback and communication at the proposal review stage (2 PIs), a high level of support from the HSRI team (1), and flexibility in shifting budget line items (3) and reorienting the research (1) as required by the project. Funding committee members were also satisfied with the scheme management and the level of support from the funders.

Where challenges were raised, these related to:

- A disadvantage arising for LMIC researcher due to lack of familiarity with the UK proposal process (2 PIs). Providing example proposals as well as webinars and Q&A sessions could help to address this issue.
- Difficulties in reviewing applications in HPSR, due to the multi-disciplinarity of the field. This has led to considerable variation in reviewers' assessments and comments (2).
- The complexity of the Je-S system, especially for non-UK applicants on budget entry (2)
- The complexity of and requirement for Researchfish® reporting beyond the grant (3)
- Administrative issues in releasing funding, with delays being particularly problematic for LMIC institutions (1, 1 co-I)
- The lack of exchange rate control, posing a particular risk to LMIC institutions (1)
- The JeS system does not allow teams to demonstrate equal partnerships between the HIC and LMIC partners e.g. joint PIs. This is important in the context of the need to decolonise global health research (1)

#### 6.1.6 Promotion of the scheme

HSRI call opportunities were considered to be communicated through the right channels and to the right extent (with the caveat that all consultees had been applicants themselves). Almost all the PI survey respondents (95%, 25 of 26) felt that the calls for proposals and other HSRI information are communicated through the right channels. One PI was unsure about the communication reach in LMICs.



The majority of unsuccessful applicants (80%, 25 of 31) felt that the calls for proposals and other information on the HSRI are communicated through the right channels and reach the relevant research community in the UK and LMICs.

## 6.2 The review process

Current and former funding committee members consulted considered the review process to be fit for purpose, and to 'work well'. Diversity is still concern, specifically in relation to the low success rate of LMIC-led proposals, representation of social sciences, and the quality of engagement with LMIC partners and stakeholders. The latter relates to ensuring equitable partnerships between HICs and LMICs, and assessing the quality of impact statements and policy maker engagement from proposals. Two committee members wondered whether the pathway to impact statements were being implemented as promised and whether they were effective in generating the desired impact/s.

A further concern / challenge was the high burden on committee members and the volume of applications, particularly for the outline and foundation grant applications which do not go to peer review. The worry is that decisions have to be made quite rapidly and the funding committee may not always get it right. The high burden is a general issue for review panels and not specifically an HSRI problem.

The selection criteria were also seen as broadly appropriate, although one interviewee felt that the committee was constrained by conventional biomedical funding models. There is acknowledged tension between the quality and impact criteria. For instance, a proposal may be extremely well written and clearly thought through, and yet likely to have less impact. In contrast, a proposal may be coming from a group on the ground which is less polished but is likely to have impact. In practice, the panel does attempt to achieve balance between both criteria, and it was reported that some committee members were willing to be quite outspoken about the need to support more research that was likely to have greater impact because of its connections and embeddedness but was ostensibly of lower quality.

The funding committee is seen as well balanced in terms of the diversity of disciplinary expertise and geographies represented.

The type and quality of applications received has changed over the years according to funding committee members. In the initial calls, the focus of the proposals was narrower, for instance, health services research and intervention-based study designs were more popular. In later calls, applications have covered wider perspectives e.g. political science and governance. The quality of applications (including from LMICs) and the extent to which social sciences are embedded in projects are also perceived to have improved over time. To a certain extent, this shift is due to a change in the framing of the calls according to the funding committee interviewees.

## 6.3 Project monitoring & evaluation

In line with UKRI's reporting requirements for all funded research, award holders have to annually report outputs and outcomes via the Researchfish® platform. This includes reporting on publications and policy influence, as well as other indicators such as funding secured, dissemination activity, and tools, databases, software, IP and products developed.

While the platform was seen as valuable and the "best system there is at the moment" for many key opinion leaders including some funding committee members and funders, it is perceived to be less helpful for pinning down the impacts or the pathway to impact. One funding committee member felt that ensuring accountability for impact was important and an annual

report submission of some kind might be useful especially in understanding to what extent HSRI projects are implementing their stated pathways to impact and delivering impact. Moreover, this could help inform the programme design and application requirements as funders and funding committee members would know “what works”. It could also act as an incentive for grantees to engage meaningfully with stakeholders and focus on activities to create impact from their research.

#### 6.4 Additional activities to improve impact

PIs and co-Is highlighted a range of further funding needs, both within the HSRI grant and following HSRI projects. These included:

- A budget line for dissemination and networking (18 PIs; 25 and 18 co-Is respectively) as part of the project, e.g. travel and conference attendance, as well as further translational activity following the project (2 PIs). In the context of the latter, two PIs mentioned (and welcomed) the upcoming call for Policy and Practice Awards
- Funding of PhD students and postdocs as part of the HSRI project, which would also support capacity building (2 PIs from LMICs, 2 from UK, 1 co-I); support for training (8 HIC co-Is, 8 LMIC co-Is)
- Funding to cover writing of publications after the project has completed, especially for PIs in LMICs who cannot cover the time required through other sources (2)
- Follow-on grants, on a competitive basis, to enable extension of the HSRI collaboration beyond the first award achieve longer-term capacity building (1 PI). However, another PI from an LMIC commented positively on the length of HSRI grants in this respect: “The length of the grants is really beneficial. Many grants are one-year or two-year grants, and you can barely get the project off the ground. So I think the HSRI’s slightly longer-length grants really have a huge benefit, enabling you to build relationships and collaborations, and see longer term impact. I think that’s a major plus.”
- small “catalyst” grants to develop partnerships and shape ideas into proposals (2 PIs)

Going forward, three PIs recommended the HSRI maximise its impact by supporting networking and collaboration between project teams. Suggestions included supporting information exchange and learning across HSRI teams (e.g. seminars and workshops), as well as enabling further collaboration to develop a common message for dissemination to policy makers. As one PI explained: “Research cannot be looked at in isolation, research has to be looked at as part of a story. And if you have five different people telling a similar story in five different continents, somebody needs to bring them together to develop *one* story. The kind of impact that would have is massive.”

A funding committee member suggested having ‘virtual research days’ to bring the research teams and government stakeholders together to present the research findings and talk about the implications of these for policy. This would help embed a culture where stakeholders engage with research and are invested in the research journey along with the HSRI teams.

## 7 Conclusions and recommendations

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### 7.1 Conclusions

This project addressed the four main objectives as set out in the technical specification of the review and below we provide conclusions for each in turn.

1. *To provide information on whether and how the programme delivers on its core aim of generating high quality, internationally competitive research which addresses key questions on strengthening and improving health systems in LMICs*
  - The HSRI is addressing a key opportunity to fill a need in the global health research funding landscape in terms of making funds available to conduct HPSR with relevance to LMICs. In turn, the scheme is funding relevant questions with high-quality applications in competitive funding calls as evidenced by the testimonies of funding committee members. Publications from HSRI projects are being cited by other researchers, and several have an above average field-weighted citation impact
2. *To investigate whether there are outcomes and impacts from research funded by the programme; to explore and describe what barriers and facilitators there are to achieving impact, and how future impact can be maximised*
  - The review shows that the desired outputs such as publications, databases, training materials, methodological tools and intervention products are being produced from the HSRI projects. Moreover, further funding is being attracted, and new collaborations are being facilitated and existing collaborations are being strengthened. Stakeholder and policy engagement is also occurring across all stages of projects, including in the design and implementation phase
  - There is some evidence of research uptake by policy makers and practitioners as well as of influence or implementation in local as well as wider contexts. Where this has not been achieved, there is potential for implementation, scale-up and downstream impact
  - Evidence of impacts in the form of strengthened LMIC health systems, improved access to health care and health improvements is limited, but it is important to acknowledge that there is a time lag to impact. Individual projects are unlikely to spur systemic change, and it is difficult to find evidence (other than anecdotal) to attribute a policy or system change to a research project
  - Barriers to achieving impact range from inconclusive research findings to inform policy to limitations of implementation of research results due to or incomplete evidence base, turnover of engaged policy makers and practitioners and challenging political or economic environment
  - Meaningful engagement of stakeholders such as policy makers and practitioners, including embedding these stakeholders in the research (co-creation); timeliness, relevance and robustness of the evidence; and partnership or appointment with national ministry of health or an international organisation are key enablers of impact
3. *To provide the funders with case studies representative of the work funded under the programme that can be used to demonstrate the range of outcomes and impact*
  - Summary of representative case studies are presented in Section 4.7 with the longer in-depth case studies describing the activities and pathways underpinning the outcomes and impact achieved in Appendix F

- The case studies cover a range of impact dimensions: building capacity among both researchers and policy makers/practitioners (knowledge producers and users), uptake of research findings by policy makers and practitioners, policy and practice guideline changes, implementation of policy/practice change to optimise and strengthen health systems, and scale-up
4. *To provide guidance to the funders on future monitoring, evaluation and learning for the programme*
- Researchfish® is the “best system there is at the moment” and provides a valuable platform to monitor outputs, outcomes and impacts. It is mostly useful to record self-reported information and enumerate these, but additional work is needed to assess their quality and value and understand whether the planned pathways to impact have been achieved. In particular, recording and assessing capacity building is more challenging as there may be various aspects at play, including non-formal training.
  - The Theory of Change for the initiative was updated through a participatory workshop and a comprehensive indicator framework was developed (see Section 3). This can be used as a guide for future monitoring, evaluation and learning purposes. We would expect that over time data will become increasingly available as outcomes and impacts accrue.

Overall, this review's findings show that the HSRI's objectives are being met. Methodologically rigorous and high-quality HPSR of relevance to LMICs is being funded through the programme. The grants are being largely delivered by multi-disciplinary teams involving equitable HIC-LMIC partnerships. In turn, the projects are

1. Adding to the body of evidence on how to strengthen health systems in LMICs
2. Informing the delivery of evidence-based interventions or health system reforms
3. Generating evidence that is relevant to decision makers and practitioners needs and can be taken up into policy or practice
4. Enabling capacity development among both researchers and research users

## 7.2 Recommendations

Based on evidence and opinions gathered throughout the review, five recommendations have been formulated. The recommendations were validated and critically assessed in a validation workshop with members of the HPSR community (see Section 2) following which they were further refined. The rationale underlying each recommendation and suggested actions for funders are described in detail below.

1. *Funders should continue to fund the HSRI, maintaining its overall design and scope*

**Rationale** – The HSRI is addressing a crucial need in the funding landscape. It is one of the very few programmes globally dedicated only to HPSR, a very under-funded research domain. In this context, the funding made available through the HSRI is key to maintaining and growing global HPSR capacity and activity. The broad scope which accommodates the entire spectrum of HPSR along with innovative and interdisciplinary approaches is appropriate and allows bottom-up development of ideas relevant to LMIC needs.

**Suggested actions** – The dual mechanism of foundation and full grants should be continued in its current form as it appears to facilitate building new capacity and new entrants to HPSR, and also represents value for money.

The application form however could be streamlined with repetition reduced to make proposal writing less burdensome for applicants.

2. *Launch strategic discussion on selection criteria and balancing competing priorities during application review*

**Rationale** – Feedback from PIs and funding committee members highlights some tensions because of competing priorities for the scheme. For instance, the scheme aims to support both high quality research and individual / institutional capacity strengthening. While these objectives are not mutually exclusive, they may on occasion be in clash with each other. For example, individuals and institutions with existing high-level research capacity will be more likely to produce the highest quality proposals, and thus get funded.

A similar tension exists between the desire to fund novel research versus the research most likely to have impact. The most impactful research will not necessarily be novel and vice versa. HPSR can often be methodologically agnostic with researchers applying methods from different fields to answer a question. Some interviewees perceived the application processes and review to be dominated by a ‘biomedical research worldview’ and are thus concerned that other types of approaches may be viewed less favourably during review. There are also concerns that applied research proposals or those with high relevance and expected impact in a specific context but which are less polished (e.g. from an LMIC researcher not familiar with UK funding applications) may be rated lower. These tensions are of particular concern when insufficient funding is available for all fundable proposals in HSRI.

**Suggested actions** – There is evidence that funding committee members are alert to these tensions and strive to balance the various criteria. However, explicit guidance as to how to address these tensions (e.g. hierarchy of considerations) could support committee members in the short term, and in the longer term, a wider strategic discussion could provide further clarity on the relevant priorities for HSRI. One key opinion leader suggested that criteria may need to be tweaked rather than just balanced. They felt that capacity strengthening is being viewed from a narrow lens in terms of both activities and geography. There is an opportunity to engender capacity development through things like curriculum development and also in the UK and other HICs.

3. *Explore options to increase diversity of successful applicants*

**Rationale** – This review showed that certain institutions, countries and research areas (e.g. service delivery) dominate the HSRI portfolio. This could be a reflection of the size of the HPSR community which is relatively small, with few institutions possessing sufficient capacity to conduct high-quality HPSR. For the same reason, it may appear to be a ‘closed’ community, and more diversity would be desirable in terms of the institutions, countries, research questions, and disciplinary perspectives represented in the award portfolio. Diversity in terms of increased leadership from LMICs is particularly desired by funders and the research community.

**Suggested actions** – To achieve this additional diversity, the funders should explore their options in collaboration with key opinion leaders and/or funding committee members. Suggested mechanisms included framing the calls for proposals and application forms to be inclusive of diverse groups, allowing co-leadership of grants (e.g. between UK and LMIC), communicating the call through LMIC fora to ensure wider distribution of the opportunity and providing dedicated support and guidance for LMIC researchers on how to write a successful HSRI proposal (e.g. grant writing workshops). This approach is expected to contribute to developing new individual and institutional capacity and broadening the community for HPSR. Diversification could also be achieved by allowing a co-PI arrangement between UK and LMIC researchers and/or biomedical and social sciences researchers to jointly run the projects.

#### 4. Support stakeholder engagement and networking activities to enable impact

**Rationale** – The review showed that stakeholder engagement in the design and implementation of the award, as well as post-award, is an enabler of relevance, policy influence and health system changes. To maximise the potential for policy and health system outcomes and impacts, the HSRI funders should consider supporting stakeholder engagement activities to promote dissemination of knowledge and HSRI project findings as well as buy-in to the research and/or its findings. Since the HSRI is a strong signature programme, sharing experiences as widely as possible, among funders, policy makers, and universities can be good for capacity strengthening in itself, for instance, to improve funding, conduct and implementation of HPSR.

**Suggested actions** – Mechanisms could include offering small grants to help build research collaborations and engage target stakeholders (pre-award), as well as further funding for continued and wider stakeholder engagement once the research findings and their usefulness have been established. Stakeholder engagement could be further supported through the organisation and attendance of joint fora (e.g. workshops, seminars, conferences, training days) for researchers and stakeholders or indeed knowledge brokers (as opposed to academics).

'Virtual research days' could bring the research teams and government stakeholders together to present the research findings and talk about the implications of these for policy. This would help embed a culture where policy makers and practitioners, in particular, engage with and co-produce research, consult evidence before making decisions, and demand research evidence from researchers where none is available. HSRI funders could enable this function for their portfolio of projects by providing a shared platform for health systems knowledge translation. For example, the Dutch Research Council (NWO) commissioned a specific networking project in their Global Health Policy and Health System Research programme that supported synergistic activities between research projects and embedding these within global structures.

The HSRI could further facilitate impact by supporting networking between HSRI projects and / or applicants. This could include an online forum for applicants / grantees or seminars and workshops. This would support knowledge exchange across research groups, perhaps germinating new collaborations; engender synergy and learning in common research areas, even if the country contexts or settings are different; and enable development of common messages or policy briefs for dissemination to policy makers. There is also an opportunity to partner with Health Systems Global to further facilitate networking and knowledge exchange among health systems researchers.

#### 5. Undertake wider monitoring activities

**Rationale** – Researchfish® provides information on outputs and outcomes achieved but how activities undertaken contribute to progress made and eventual impact is not clear. Focussed monitoring of progress and outcomes is advisable, enabling the funders to understand the nature and extent of stakeholder engagement undertaken, the progress made in project implementation and towards outcomes, and the likely potential for impact. This will also help funders understand what pathways for impact and enabling factors underpin achievement of outcomes and subsequent impact. This knowledge could be used to inform review processes in the future.

**Suggested actions** – Funders could provide HSRI-specific guidance or exemplars to PIs for filling in Researchfish® which could help funders get more consistent data. The option of having additional HSRI-oriented questions, for example, to capture capacity building or health systems outcomes and impacts better could be explored. Such questions could



include questions on the number of PhD theses supported, career progression, etc. NIHR has adopted this approach to monitor patient and public involvement across their funded programmes.

Wider monitoring approaches could be conducted in line with the TOC and indicator framework as described in Section 3 and to fill in the relevant data gaps in Researchfish®. Further monitoring could also include a short narrative report, for instance, in the form of an impact case study or end-of-grant report. These outputs could also be used for dissemination and knowledge exchange purposes by the grantees and funders.



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