Seven Approaches to Investing in Implementation Research in Low- and Middle-Income Countries

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Seven Approaches to Investing in Implementation Research in Low- and Middle-Income Countries

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About ESSENCE and this good practice document

ESSENCE (Enhancing Support for Strengthening the Effectiveness of National Capacity Efforts) on Health Research is an initiative to coordinate and harmonize investments in research capacity in health in low- and middle-income countries. ESSENCE members embrace the principles of donor harmonization and country alignment expressed in the 2005 Paris Declaration on Aid Effectiveness and in the 2008 Accra Agenda for Action. In following these principles, donors try to harmonize and align their activities and procedures with the priorities of the countries in which they work. To contribute to this alignment, ESSENCE members agreed to work together to develop and distribute the Good Practice Series – a set of publications that incorporate members' views, questions and experiences in the field of health research and development. The first of these, *Planning, monitoring and evaluation: Framework for capacity strengthening in health research*, was published in 2011 and updated in 2016. The second, *Five keys to improving research costing in low- and middle-income countries*, was first published in 2012 and updated in 2020. Two other good-practice documents, *Seven principles for strengthening research capacity in low- and middle-income countries: Simple ideas in a complex world* and *Six practices to strengthen evaluation of research for development*, were published in 2014 and 2016 respectively.

This document arose from the recognition that, by sharing good practices, funding and research organizations can enhance the ways in which they invest in implementation research (IR) as well as build capacity in low- and middle-income countries. Although the ESSENCE group focuses primarily on health research, its members hope that these approaches will be shared across other areas of research as well.

The approaches outlined here are the outcome of a collaborative process that involved many participants throughout the world. In early 2017, ESSENCE members formed a Working Group on Implementation Science to guide the development of this good-practice document. The following year, a literature review was completed and a survey was conducted to learn whether and how ESSENCE members fund or use IR. In 2019, a consultant was hired to help analyze the survey data. In addition, semi-structured interviews were held with key funders to identify opportunities and challenges that they face when they invest in IR in LMICs. Engagements between funders and organizations that receive funding were critical at this point. A first draft of this document was completed in mid 2019 and circulated for review. A number of focus groups and consultations followed that proved critical in helping to shape this final version.

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Introduction

Many scientific discoveries that could improve human health and well-being are never put into practice, and some discoveries that are effective in treating an illness in one region of the world fail dismally in others. This is partly because funders and researchers have focused more on discovery research – such as the development of vaccines for example, for which researchers need a disease-endemic country and a known field site from which they are able to observe how a disease responds to treatment.

However, funders that focus on improving health, particularly in low- to middle-income countries (LMICs) (as well as in low-income contexts that exist within high-income nations), are now increasingly using the innovative frameworks and methodologies that underpin implementation research (IR). Their aim is to understand and bridge what Graham et al. (2018) describe as the gaps between 'knowing and doing'. To do this optimally, collaboration between researchers, policymakers and health practitioners is vital (Theobald et al. 2018).

For example, in 2012, the Prevention of Mother-to-Child Transmission (PMTCT) Implementation Science Alliance was established. With the aim of optimizing synergies between those involved in research and those involved in policymaking and program implementation, the PMTCT Alliance has become a kind of 'living laboratory', providing opportunities for strong collaborative relationships that have helped accelerate the uptake of PMTCT programs worldwide.

The hope is that knowledge about how to bridge the gaps between knowing and doing will encourage funders and research institutions to leverage past, present and future investments in health research, and to improve health outcomes throughout the world (Peters et al. 2013).

As a new field of study, the sharing of information about what IR is, and what makes it work, is urgently needed. Even the term 'implementation research' is still being defined. In fact, Odeny et al. (2015) identified 73 different definitions. In many of these, the terms 'implementation research' and 'implementation science' are used interchangeably.

In developing this publication, we found the following definition from the journal, *Implementation Science*, both clear and comprehensive:[1]

> Implementation research is the scientific study of methods to promote the systematic uptake of proven clinical treatments, practices, organizational, and management interventions into routine practice, and hence to improve health. In this context, it includes the study of influences on patient, healthcare professional, and organizational behavior in either healthcare or population settings.

1 See https://implementationscience.biomedcentral.com/about; see also Appendix 1 for some other widely used definitions.

As Theobald et al. (2018) point out, several practices are embedded in the basic concept of IR. These include:

- **Forming collaborative partnerships** – conducting research in ways that require researchers to work across disciplines and to liaise closely with communities, patients, implementing agencies, donors and policymakers throughout their research and implementation processes. The aim is to build collaborative partnerships and encourage the *coproduction of knowledge*, such that each group is able to enhance the relevance and appropriacy of the research topics and processes, as well as its eventual application.
- **Using multi-disciplinary teams** – this includes using a range of methodologies to collect, document and analyze data on key health problems, and to test contextually tailored health interventions and strategies.
- **Identifying implementation outcomes** – this requires evaluating the feasibility, adoption and acceptance of interventions, in terms of their quality, equity, efficiency, scale, sustainability and coverage or reach – particularly in relation to the inclusion of disadvantaged groups.
- **Ensuring responsive systems** – that is, making certain that health research contributes to the building of stronger and more responsive health systems within the realities of specific contexts.
- **Addressing implementation challenges** – this involves seeking to understand and address the difficulties involved in the implementation of research findings, and finding sites outside of health facilities in which health care can be effectively promoted, such as in faith-based groups, schools and businesses.
- **Involving policymakers, researchers and communities** – this requires the building of solid alliances and partnerships that help to inform health policy, improve health management and health services, while supporting and empowering research institutions and local communities.

Conducting IR also involves some significant trade-offs.

Trade-offs that can be necessary in implementation research

- Weighing up the thoroughness of the process versus the urgency of the required information or behavior change.
- Staying faithful to or adapting existing implementation protocols.
- Choosing locally embedded versus externally identified and verified approaches.
- Seeking generalizable knowledge or solving context-specific problems.
- Designing IR and related administrative processes in ways that encourage and support researchers and their institutions, rather than focusing primarily on meeting funders' requirements.

Not all funders have grasped the advantages of investing in IR in LMICs, and many have questions about how they can best support this new field. In addition, few LMICs have the resources to make significant investments of their own in IR.[2] Ideally, funders and research institutions must find ways to invest in IR using methods that will simultaneously build and sustain local capacity (Smits and Denis 2014; Tetroe et al. 2008).

In this document, we attempt to respond to questions raised by funders and researchers about how to seed and sustain IR in LMICs. Based on a literature review and an analysis of responses to a survey we conducted, as well as interviews with key informants, we highlight seven approaches for organizations to consider when investing in IR.

The approaches offer some broad direction for funding organizations, research institutions and researchers. One or more case studies are included with each approach to help provide further information and inspiration from existing IR programs. A selection of training resources is also included at the end of the document.

Throughout the text, as in other ESSENCE publications, we deliberately refrain from using the term '*best* practices'. We acknowledge that what constitutes an 'ideal' or even a 'good' example of IR in LMICs is not yet clear. IR tends to be project and context specific – what works well for one funder or research institution might not be appropriate for others. Accordingly, we offer the seven approaches, listed below and described in more detail in the pages that follow, as a work in progress. We hope this will contribute to the further evolution of this crucial field.

Seven approaches to investing in implementation research in low- and middle-income countries

- Include all stakeholders from the outset.
- Embrace the diversity of being involved in implementation research.
- Expect and enable implementation research practices to evolve.
- International partnerships are important; join one or form one.
- Integrate training, mentoring and fellowships into IR programs.
- Communicate funding criteria clearly.
- Embed implementation research into health systems.

2 The World Bank's Global Financing Facility has found that very few LMICs meet or exceed its recommended budget allocation threshold of 5% for IR and delivery science (as opposed to discovery science).

Approach 1: Include stakeholders from the outset

> Start with the end in mind.
>
> – Stephen Covey, *The 7 Habits of Highly Effective People*

One of the best ways of enhancing the effectiveness of public health interventions is to involve the end-users – health practitioners, patients, health administrators, policymakers, funders and other community stakeholders – from the *inception* of the research process. This involves consulting 'stakeholder' groups in open and transparent ways, and asking them to help identify their own specific research needs and concerns. Equally crucial is informing all stakeholders how the process will work, as well as how and when they can contribute most effectively. These consultations can help to create a solid basis for the implementation of research findings and increase the chances of research outcomes aligning with the real needs of the communities involved. As the case studies in this section show, funding agencies are increasingly aware of the importance and complexity of stakeholder involvement in ensuring that investments made in research programs have a wider impact.

One of the more complex issues in IR is integrated knowledge translation (iKT).[3] This refers to the practice whereby researchers and knowledge-users work collaboratively to address research questions from multiple perspectives, and then 'translate' their findings into language and/or solutions that knowledge users can apply.

Funders are in a position to mandate and facilitate partnerships between researchers and end-users but must be aware of the difficulties that can be involved for all parties. While partners can establish relationships based on the alignments and synergies in their goals, unequal access to resources can easily create power imbalances. Add cultural differences and language barriers to this mix, and even the most well-intended processes can flounder. Funders and research managers must try to anticipate these complexities, and ensure that capacity building programs cover such issues in ways that empower all parties with an awareness of the issues, tools with which to address them, and spaces or forums in which they are encouraged to do so. (See Case study 1.1 for an example of a project that places multilevel IR collaborations at its core.)

Address 'implementation disconnect'

'Implementation disconnect' is what happens when individuals and institutions form part of complex systems but are subject to bureaucratic assumptions that ignore this complexity. In this situation, stakeholders are often left to juggle competing mandates, incentives and forms of accountability (Theobald et al. 2018) with no guidance about how to do this. In addition, conventional monitoring and evaluation often fails to capture the contextually and culturally relevant feedback that might help stakeholders to reconnect. Funders and researchers must remain alert to these issues and be willing to review process issues iteratively and/or to offer supplementary training for various stakeholders during and after IR processes. This is especially true for systems-building processes, where implementation challenges can be immense. Investments in improving public health are necessarily multilayered but must, ultimately, target the end-users at the implementation level. Involving all stakeholders from the start of a process can help keep this priority at the forefront of project work and ensure that 'ground level' roleplayers acquire the skills they need to participate fully (see Case study 1.2).

3 The Canadian Institutes of Health Research seem to have first coined the term iKT, but many similar terms are used to articulate this concept According to Nilsen (2015), 'the terms knowledge translation, knowledge exchange, knowledge transfer, knowledge integration and research utilization are used to describe overlapping and interrelated research on putting various forms of knowledge, including research, to use'; see also Sibbald et al. (2014).

Support platforms that link funders and researchers with practitioners and policymakers

Funding the formation and activities of new IR platforms will facilitate the wider study and documentation of perspectives of implementing partners, policymakers and other end-users of health research. This should, in turn, lead to research that is increasingly comprehensive, relevant and actionable. A structured group exercise conducted at the 2016 conference of the Nigeria Implementation Science Alliance (NISA) is one example of how a national funder supported a study that included the perspectives of researchers as well as implementing partners, policymakers and other stakeholder groups. Funders would do well to fund IR in which this sort of engagement is envisaged from the earliest stages so as to improve research uptake at all levels (see, for example, Case study 1.3).

Case study 1.1 | Working collaboratively to set research priorities

Acknowledging that priority-setting for investments in research is often determined without input from endpoint decision-makers, and that this results in a gap between 'evidence needed and evidence produced', the USAID-funded Health Evaluation and Applied Research Development (HEARD) Project adopted a consultative approach to IR.

This was 'rooted in an understanding that the use of evidence to improve health policies and programs requires the long-term active engagement of multiple actors representing an extensive array of skill sets and experiences.' HEARD's consultative process actively engages funders, researchers and academic institutions, health practitioners, policymakers and community advocates at global, regional, national and sub-national levels across Asia, Africa, Europe and North America.

By being included in technical advisory groups, working groups and study review groups, stakeholders remained engaged throughout the research process, allowing for feedback and continuous learning. This engagement helps shape and promote a dynamic IR agenda and the active uptake of research findings.

IR priorities are iteratively developed through a combination of approaches including literature reviews, rapid scoping, interviews, stakeholder meetings and surveys. By using multiple means to solicit and confirm priorities, HEARD has been able to generate robust IR agendas on a range of topics. And while it might not be possible to fund the full IR agenda immediately, the process helps to prioritize IR in ways that are relevant beyond specific funding opportunities and ensure that important issues are followed up in future.

Outcomes of this approach include:

- Increased relevance and uptake of studies.
- Larger in-country IR capacity.
- Increased involvement of decision-makers in requests for relevant and timely IR studies.
- Stronger platforms for generating responsiveness to in-country needs.
- Continuous and mutually beneficial learning that facilitates the use of innovative research methods.

HEARD employs a broad stakeholder engagement process, taking into consideration who will be using the evidence generated and who can continue driving an effort forward to create a path to sustainability.

Source: https://www.heardproject.org/

Case study 1.2 | Making multiple stakeholder involvement a central requirement for funding

In a 2015 call for grant applications, the Global Alliance for Chronic Diseases (GACD) and the NIH's National Heart, Lung, and Blood Institute (NHLBI) clearly stated that they wanted grantees to make IR a core aspect of all proposals. The term IR even formed part of the title of the call, which read: 'Late-stage implementation research addressing hypertension in low- and middle-income countries: Scaling up proven-effective interventions (UG3/UH3 clinical trial optional).'

The NIH's call for applications is quoted extensively below because it shows so clearly what funders expect from health research:

> The NIH expects research supported by this funding opportunity announcement to be designed and planned *in collaboration* with in-country government agencies, NGOs, and health care institutions and organizations so as to: be *responsive to local needs*, interests, and capacities; *embrace cultural and health system factors*; and to *increase the likelihood of long-term sustainability*.
>
> The NIH expects research supported by this funding opportunity announcement *to align with commitments or planned commitments … across health or other sectors (e.g., education, information technology)*.
>
> As such, this funding opportunity announcement is intended to support applications that propose partnerships with representatives from:
>
> i) one or more LMIC research organizations;
> ii) one or more LMIC government agencies with a health-related function (e.g., Ministry of Health; Ministry of Social Welfare; Department of Health; Ministry of Public Health, etc.) and that has a policy-making, evaluation, or research role within the agency; and
> iii) one or more LMIC NGOs and/or health care institutions or systems that provide access to provider and service user viewpoints, so as to be responsive to local needs, interests, and capacities.
>
> *Policymakers, intervention payers (excluding research funding agencies), local in-country researchers, implementers, and beneficiaries are expected to be involved at all stages of the interventions' selection, adaptation, and implementation design to identify the challenges to the delivery of the interventions in real world settings. Such partners will be integral to the success and sustainability of the programme and it is essential that they are engaged early and participate equitably and meaningfully in the design and conduct of the proposed research.*

Source: https://grants.nih.gov/grants/guide/rfa-files/RFA-HL-20-005.html (emphasis added); see also Case study 6.1 for more on this call for funding.

Case study 1.3 | Establishing a national-level alliance for IR

The Nigeria Implementation Science Alliance (NISA) was established in 2015. The alliance began as a collaboration between PEPFAR-supported implementing partners, universities and policymakers, who wanted to use IR to enhance the quality of health services (Sturke et al. 2014).

Nigerians who were part of this process were then inspired to build their own national program, and NISA has since developed into a robust partnership of 20 local organizations. Comprised of researchers, program implementers and policymakers, these organizations are committed to identifying, understanding, measuring and sharing IR undertaken in Nigeria.

NISA acknowledges that numerous approaches can be used to increase IR capacity and to bridge the gaps between evidence gathering, decision-making and implementation processes. The alliance members offer one another a space in which to discuss and reflect on cross-cutting IR issues. Through this, they attempt to enhance research-to-policy resonance, using a range of culturally appropriate methods and interventions to promote and improve public health.

In 2018, NISA funded a study that was conducted by implementing partners and policymakers in Nigeria to identify gaps in developing research capacity and to recommend strategies for addressing these gaps (Ezeanolue et al. 2018). The research study identified the following gaps: lack of funding; poor research focus in education; inadequate mentorship and training; inadequate research infrastructure; lack of collaboration between researchers; dissonance between research and policy agendas; lack of motivation for research and a lack of buy-in for research from institutional leaders.

By searching for effective ways of addressing these gaps, NISA has begun to enhance IR capacity in Nigeria at multiple points in the IR continuum, and is noteworthy for its inclusion of implementers, policymakers and other end-users in the search for solutions.

As part of this process, NISA organizes an annual IR conference in Nigeria. In the past, this has been attended by over 200 participants representing over 50 organizations. Executives from top health agencies attend and participate in panel discussions, and an average of 60 posters or oral presentations are presented. The event is expected to reach even more stakeholders in future.

Sources: See https://www.fic.nih.gov/About/center-global-health-studies/Pages/pmtct-prevent-mother-child-transmission-hiv.aspx. See also https://nisaresearch.org/

Approach 2: Embrace the diversity of being involved in implementation research

> It is not enough to know if a health intervention is effective; it is also necessary to understand why the intervention works, how, for whom and in which contexts. It is here where implementation science is an undeniable aid.
>
> – Valéry Ridde, 'Need for more and better implementation science'

Even the most experienced funders and research institutions can be unsure about how to move forward in this complex and fast-growing area of research. However, the path becomes clearer when organizations know and follow their mission. In general, IR requires longer-term studies (5 years or more). However, many funding agencies are constrained by their own (annual) budget allocations, and therefore prefer to finance shorter-term research programs (1 to 2 years). Hybrid entities, such as research councils, which channel income to IR from a range of different sources, are sometimes able to be more flexible about budgetary timelines, but even these are still accountable to their funders and thus bound by their reporting requirements.

Be strategic in thinking and planning

Funders' IR investments tend to be guided by their organizations' strategic plans. In some cases, these already include an explicit mandate that directs programs to focus on IR (see Case studies 2.1 and 2.2). In the absence of a clear mandate to fund IR, some organizations have taken a more ad hoc approach to this work and have produced impressive results (see Case study 2.3). As long as this kind of ad hoc funding does not prevent the systematic uptake of IR, it can be a practical way for funders to gain experience with this kind of research, and thereby help to formalize organizations' commitments to IR in the longer term.

Ideally, the importance of IR should be reflected in the long-term strategic thinking and planning done by funders and research organizations. However, it can take time for organizations to see IR as critical to their mission. In the meantime, funders and research organizations can look for opportunities to 'learn by doing' within the scope of their existing mandate, thereby gaining experience in investing in IR, honing their expertise and helping to inform the design of well-conceived and appropriate approaches to this important issue.

Case study 2.1 | Making IR part of organizational strategy

Fogarty International Center (FIC) is affiliated to the US's National Institutes of Health (NIH) and was established in 1968 to support global health and behavioral research, to build partnerships between health research institutions in the US and elsewhere, and to help train researchers to address global health needs.

From about 2010, IR was specifically highlighted in the FIC's organizational strategy. Goal 3 of its strategic plan states that the Center aims to 'support research and training in implementation science.' Within this, FIC's priorities are to 'expand investment in research and research training in implementation science across programs [and] catalyze interaction between researchers, policymakers and program implementers to promote uptake of evidence into global health policy and practice.'

Incorporating support for IR into its strategic goals has enabled the FIC to expand its investment in IR and IR training across many of its programs. It has also helped to catalyze interactions between researchers, policymakers and program implementers to enhance the uptake of evidence-based research in global health policy and practice. As of 2020, the FIC had trained approximately 166 researchers in IR (see https://www.fic.nih.gov/About/Pages/Strategic-Plan.aspx).

Once funders and research institutions have a mandate to conduct IR, they can use this to make a persuasive case for funding this work. This can range from ensuring that IR forms part of both the strategic planning and priority setting in broad programs and specific projects (such as understanding the barriers and motivating factors linked to the use of bed nets for malaria prevention for example).

Case study 2.2 | Dual-level mechanisms for IR priority setting

The WHO's Special Programme for Research and Training in Tropical Diseases (TDR) takes a two-tiered approach to prioritizing how it funds IR. First, TDR has a scientific and technical advisory committee that is responsible for developing its high-level strategy. This involves identifying and selecting the broad areas in which TDR should invest. These include efforts to help eliminate a deadly infectious disease or to improve implementation of disease control.

Second, TDR has several scientific working groups that think about specific priorities within the broad areas identified by the advisory committee. These working groups are tasked with developing actionable, strategic plans.

This dual approach has two clear advantages. First, it responds to institutions' mission-driven goals which usually involve identifying broad areas for investment. Second, it can help to ensure that program-specific potential for impact is built into budget allocations right from their inception and conceptualization. Both aim to ensure maximum impact within the available opportunities in the context of particular health issues, regions or countries.

Case study 2.3 | Linking IR to existing or earlier clinical trials: opportunistic funding as a strategy

The UK's Department for International Development (DFID) does not have a stand-alone IR program. Instead, IR is embedded in several of its programs, and research consortia have become its main vehicle for funding IR. DFID has shown how fruitful it can be to fund IR through 'dynamic consortia' that bring together policymakers, government departments, academics and health practitioners. By supporting these consortia, DFID has helped to ensure that IR is integrated into research programs (including clinical trials) across a range of important themes, including family planning, mental health, the structural drivers of the HIV epidemic and improving health systems.

For example, a major barrier to the roll-out of antiretroviral therapies (ART) in low- and middle-income countries was the perception that all patients on treatment needed regular laboratory tests to maximize the effectiveness of the therapy and minimize potential side effects. This was a major obstacle, particularly in rural areas, because laboratory tests require trained personnel as well as substantial and costly infrastructure (laboratory equipment, electricity, reagents, etc.). Even if these were affordable and available, patients would have to walk miles to access treatment, and would benefit greatly if they could access decentralized, long-term care.

Accordingly, DFID funded the DART (Developing Antiretroviral Therapy) trial to find out if the delivery of ART could be safely, equitably and cost-effectively decentralized to lower-level health centers in Africa. The trial showed conclusively that it is indeed safe to deliver ART with clinical monitoring and without a lot of routine toxicity tests. DFID then went on to fund the Lablite Project to find out if it would be safe and effective to decentralize ART provision to primary-care level. The results showed that decentralization can be safe, effective and sustainably implemented.

Thus, by working with ministries of health and other national stakeholders in both the DART and Lablite studies, DFID was able to influence national policy, improve health outcomes and reduce costs. While DFID's IR approach can be seen as opportunistic, they have used it to successfully bridge what has been called 'the valley of death' into which useful results from clinical trials can sometimes fall, thus failing to make any significant impact.

Working within (or using the results of prior) clinical trials, can be a viable option for funding, supporting and implementing IR.

Approach 3: Expect and enable implementation research to evolve

> Beyond the interdisciplinary, boundary-spanning approaches, which are necessary in global health, the recourse to mixed methods and to multiple case studies, if longitudinally possible, would be a major benefit for implementation science.
> – Valéry Ridde, 'Need for more and better implementation science'

It is vital that funders and research institutions remain alert and responsive to the challenges and opportunities that IR offers as it evolves. New definitions are continually being put to the IR community. Methodological innovations are creating new ways of conducting and including IR within other research processes. Innovative theoretical approaches are extending existing frameworks and models. While the development of such methodologies can require significant amounts of time and resources, innovative IR methodologies, built through multi-disciplinary and multisectoral collaborations, have the potential to vastly improve health outcomes in LMICs.

Clarify terminology and definitions

IR's great potential for improving health and health care must motivate funders to overcome its baffling diversity of meanings and processes. As noted in the introduction, IR's many definitions have created a degree of confusion. However, this definitional variability represents an opportunity for funders and research organizations to include distinctive details of their organization's mission into the definitions they use or adopt. Various terms are used to describe the activities encompassed by IR. These include 'diffusion research', 'knowledge translation', 'dissemination and adoption', as well as 'delivery science'. While each of these can be useful in reflecting varying levels of emphasis on different aspects of IR, inconsistency in the use of such terms can also contribute to mystification and misunderstanding. Ultimately, the most useful definitions will emerge as research partners describe how they use IR to produce better quality research and to develop deeper understandings of what enhances the appropriate implementation of evidence-based findings (Ridde 2016).

Assess methods and frameworks for relevance

Numerous methodologies, data sources and evaluation techniques are used in IR, an inventory of which is beyond the scope of this document. However, organizations that are funding or conducting IR must to be able to assess whether the methods chosen are appropriate to the research question (see Brownson et al. 2018).

IR frameworks are being developed to provide ways of better understanding and explaining how and why implementation succeeds or fails, and how to organize research so that it tilts towards success. Frameworks establish a structure and rationale for IR-related activities, and they help to rank activities in terms of relevance and importance. See for example, the Consolidated Framework for Implementation Research proposed by Damschroder et al. (2009), which suggests new and sophisticated ways of adapting IR to specific contexts.

In this lively and vibrant arena, funders and researchers have a lot of scope for innovation.

IR can be used to investigate barriers and opportunities for the implementation of proven interventions. Similarly, efforts to develop new theories, frameworks and models that are responsive to a range of different implementation contexts also require funding and scholarly attention.

New methodologies – such as the three types of hybrid clinical trials proposed by Curran et al. (2012) – and the urgent need to compress research timeframes, are relevant to health researchers globally. However, the development of methods and frameworks relevant to LMICs is particularly important. In 2018, Kemp et al. published the results of their systematic review of IR methods applied to investigating integrated HIV and non-communicable disease programs in sub-Saharan Africa. They found that only one study used a theoretical framework. This suggests that the use of methodological frameworks is not routine in IR studies conducted in LMICs, which could put researchers from LMICs at a disadvantage when they apply for funding. In addition, many current IR frameworks were developed in high-income contexts, and therefore require critical assessment and adjustment before being deployed in LMICs. Case study 3.1 shows how the US's NIH uses funding announcements to support the development of new methods and frameworks.

Case study 3.1 | Trans-NIH call for innovative IR methods and frameworks

As an illustration of how rapidly the field of IR is gaining acceptance, and how collaboratively it can operate, it is interesting to note that, in 2002, the NIH's National Institute of Mental Health issued its first call for IR (PA-02-131). By 2019, 20 NIH institutes, centers and offices were part of a trans-NIH funding announcement for 'Implementation and Dissemination Research in Health'. The 2019 announcement, like all those before it, called for studies to advance IR methods, measures and the dissemination of research. Researchers were asked to respond with proposals outlining how they would:

- Study new theories, models, and frameworks for dissemination and implementation processes.
- Develop valid and reliable means to measure relevant dissemination and implementation outcomes and processes.
- Develop study designs, research methods and analytic approaches for studying dissemination and implementation.
- Develop and strengthen tools and techniques for conducting rapid yet rigorous qualitative data collection and analysis.
- Develop rigorous approaches to comparisons of qualitative data across implementation contexts appropriate for accelerated implementation timelines.

Source: Dissemination and Implementation Research in Health (R01 Clinical Trial Optional) FOA No. PAR-19-274 (available online at https://grants.nih.gov/grants/oer.htm).

Approach 4: International partnerships are important: join one or form one

> If you want to go fast, go alone. If you want to go far, go together.
>
> – African proverb

Collaboration around IR happens at many levels; alliances exist between funders, researchers, policymakers and others. Here we focus on alliances between funders, but many of the points made are applicable to research institutions and other organizations involved in IR.

Different approaches to partnering exist (as shown in the case studies that follow), and various kinds of creative platforms are helping the field move forward. Funders generally work together because they share strategic goals, such as to improve the quality of health care in resource-constrained countries. By pooling their talents and resources, funders increase the likelihood that proven clinical interventions will make an impact beyond discovery research, and create sustainable improvements in the health of populations.

Table 1 shows some of the forms that funder partnerships typically take, and Case studies 4.1, 4.2 and 4.3 further unpack the differences between the partnership types.

Share the load and multiply impact

International funder partnerships can also act as vehicles that agencies use to work around particular challenges. For example, currency fluctuations and unsynchronized funding cycles can be overcome if partnering agencies allocate funds to one entity and support them in running the program. TDR and EDCTP have tested this option and found it works well. GACD takes a different approach, encouraging each member agency to invest in parallel in areas of mutual interest. Both options offer funders the potential of making more impact for their investment.

Table 1: Types of funder partnerships

Partnership type	EDCTP	ESSENCE	GACD	TDR
Multiple funders fund different aspects of a single program	X	X	X	X
Funders pool their contributions to create a single combined fund	X			X
Each funder funds separate projects but they coordinate their efforts	X		X	
Information exchange	X	X	X	X

Notes: EDCTP = European & Developing Countries Clinical Trials Partnership; ESSENCE = WHO Programme on Enhancing Support for Strengthening the Effectiveness of National Capacity Efforts; GACD = Global Alliance for Chronic Diseases; TDR = WHO Special Programme for Research and Training in Tropical Diseases.

Case study 4.1 | Building a global partnership around a shared focus

The Global Alliance for Chronic Diseases (GACD) includes the world's biggest funders of public health research. Together, the members account for 80% of funding spent on public health research worldwide. Its member agencies coordinate and support joint research programs on the prevention and treatment of lifestyle-related and chronic illnesses. These non-communicable diseases (NCDs), such as cardiovascular disease, diabetes, certain cancers, lung disease and mental illnesses account for an average of 60% of deaths globally and 80% of deaths in LMICs. Nearly 80% of NCD deaths occur in LMICs and NCDs are the most frequent causes of death in most countries except in Africa. Even in African nations, NCDs are rising rapidly and are projected to exceed communicable, maternal, perinatal and nutritional diseases as the most common causes of death by 2030 (WHO 2011).

GACD focuses on supporting multi-country IR that targets the needs of LMICs and vulnerable populations in high-income countries. An important part of this is the building of IR capacity and capability.

Case study 4.2 | Strengthening health research capacity

ESSENCE on Health Research is an initiative that allows donors/funders to identify synergies, establish coherence and increase the value of resources and action for health research capacity building in low- and middle-income countries. Recognizing that fragmentation and lack of coordination is not only wasteful but counter-productive, members and partners of the ESSENCE on Health Research Initiative harmonize and align health research goals and funding to promote better strategic cooperation between partners, particularly among bilateral development agencies and research funding organizations.

Case study 4.3 | Creating win–win initiatives that mean more funds for more projects

In 2017, the European & Developing Countries Clinical Trials Partnership (EDCTP), with support from the German Federal Ministry of Education and Research, the UK's Medical Research Council and the Swedish International Development Cooperation Agency, launched a joint initiative to support IR with the WHO's Special Programme for Research and Training in Tropical Diseases (TDR). The initiative was managed by the WHO's African Regional Office, which has been key in bringing IR to the forefront in Africa.

Based on the funders' mutual interest in strengthening health-research capacity in LMICs, the initiative was specifically motivated by the funders' desire to raise the calibre of IR. Their ultimate aim is to ensure that better-quality and more cost-efficient healthcare solutions are delivered to people in resource-constrained settings.

The program strengthened capacity for IR through enhancing collaboration between researchers focusing on national disease programs. Diseases covered included malaria, tuberculosis, diarrhoeal diseases, lower respiratory tract infections, yellow fever and several neglected tropical diseases.

The initiative designed a unique way of funding IR: while individual awards were relatively small in monetary value, the likelihood of impact in resource limited settings is high as these small grants facilitated collaborations between local researchers and health professionals in national disease programs.

For a single funder to manage a small-grants scheme like this would have been too resource intensive. But by pooling resources from several funders and developing a common research agenda, administrative costs were reduced and a relatively larger number of IR projects could be funded.

International funding agencies are in a unique position to coordinate national funding, and avoid duplication. For example, calls for proposals on similar research areas can be launched in parallel without creating confusion about different funding rules, and improving the strategic and scientific alignment between different funders.

Approach 5: Integrate training, mentoring and fellowships into implementation research programs

> We need to train a generation of researchers who can effectively bridge the implementation gap. This will require new curricula and interdisciplinary, systems-oriented approaches. Because some features of implementation are context-specific, it also calls for strengthening of research institutions in low-income countries.
>
> – Temina Madon et al., 'Implementation science'

New ways of building capacity in IR are urgently needed. As a relatively young field, IR has few bona fide experts and, consequently, relatively few mentors who can support students and early-career scientists. Similarly, not all funders have sufficient in-house capacity to run IR programs or evaluate the IR components of grant applications. In LMICs, too, the shortages of researchers with IR experience, and of institutions with the expertise to develop and run IR training programs, is serious (Yapa and Bärnighausen 2018). This is a field in which the value of cross-disciplinary and multi-disciplinary teams can help to expand the pool of knowledge, skills and resources that IR programs can draw on.

Enhance funder skills

Capacity building linked to IR needs to be built into all stages of grant-application evaluation and management. This can include the establishment of in-house procedures that help to equip program directors, grants managers and other staff with the necessary knowledge and skills to review IR proposals and to manage portfolios that include IR grants and programs.

Build researcher expertise

Researchers and research offices within universities and other institutions also require training. Several funders have come forward to provide this. We strongly recommend that IR funders should nurture and sustain researchers' commitment to learning through the grants they award. See Case study 5.1 for one example of a funder initiative, and see Appendix 2 for a list of organizations that run IR training and for links to some of the courses available.

Inspire health practitioners and policymakers

As noted in Approach 1, funders and research institutions must engage with health practitioners and policymakers before, during and after IR is conducted. At each stage, efforts must be made to improve the abilities of all stakeholders to understand and use the knowledge generated by IR. At a national level, funders can invest in partnerships that create training opportunities and mentorships, particularly the latter, which are sorely lacking in LMICs. These national partnerships provide the benefits of identifying IR activities within a single country and creating a forum for national stakeholders to come together and share information. In addition, national partnerships that receive support from external funders make it easier for funders to recognize and offer support where quality work is being done (see Case study 5.2).

Lead ethically

The growing field of IR is an important source for generating new insights into research ethics. To do this effectively, funders and research institutions must first adopt their own sets of ethical considerations linked to IR, and support efforts to build capacity around the ethics of IR.[4] Areas to emphasize and develop include:

- Clarifying existing ethical frameworks in medical ethics, research ethics, public health ethics and bioethics as a whole.
- Differentiating between medical ethics and public health ethics.
- Describing the key ethical considerations in public health ethics as a background to extending the ethics of health systems and IR.
- Applying the ethical principles of health systems research and IR to practical situations within health systems.

Case study 5.1 | Training researchers to write successful IR grant proposals

In an attempt to increase the skills and capacities of researchers in the Middle East and North Africa, the NIH's National Cancer Institute, the National Academies of Sciences, Engineering and Medicine and USAID designed a training course on how to submit competitive proposals for IR funding.

In 2016, a targeted cohort of early- to mid-career researchers from these regions were chosen to participate in a webinar-based course that lasted for 4 months and culminated in a 3-day workshop held in Cairo, Egypt. The workshop was co-facilitated and co-hosted by the WHO's Eastern Mediterranean Regional Office. The training aimed to introduce the field of IR to participants and to offer them guidance on developing clear and comprehensive IR proposals.

4 To assist research ethics committees to develop the expertise necessary to review IR protocols, the WHO's Special Program for Research and Training in Tropical Diseases (TDR) and its Global Health Ethics team developed a 6-module training course on the important ethical considerations involved in IR. The course manual is titled, *Ethics in Implementation Research: Facilitator's Guide* and is available online.

Case study 5.2 | Sharing experiences cross-regionally to expand research capacities

From 2017 to 2020, the International Development Research Centre (IDRC) dedicated resources to better understanding adolescent sexual and reproductive health as well as health information systems in the Middle East and West Africa. Initial calls for IR proposals from the region was followed by a rigorous selection process.

However, it was noted that the proposals lacked conceptual consistency and clarity, and that this could potentially undermine the potential for cross-project learning. This could, in turn, potentially reduce the projects' contributions to the field of IR, both in the region and more generally.

To address this, IDRC asked an external technical service provider to design a module on IR that was introduced at an inception workshop held for the projects. Subsequently, the technical service provider and IDRC staff made themselves available to guide research practice throughout the projects' implementation.

Learnings derived from this have also been integrated into a new cohort of projects in West Africa that will research the interface between sexual and reproductive health and sexual and gender-based violence.

In addition, by providing bilingual support throughout the lifetime of the program, the IDRC is hoping to enable both English- and French-speaking IR teams to develop shared conceptual understandings and terminology related to IR in this field.

Approach 6: Create and communicate clear funding criteria

> Language, that most human invention, can enable what in principle should not be possible. It can allow all of us, even the congenitally blind, to see with another person's eyes.
>
> – Oliver Sacks, *The Mind's Eye*

It is essential that funders clearly communicate the specifications and criteria they use to score, evaluate and assess proposals or applications for IR projects. This is crucial because, as noted, so many definitions, methods and frameworks are in use. Not only do these vary from one funder to another, but many grant applicants have limited training or experience of writing strong funding proposals. This is partly related to the fact that IR is such a new area of research. However, in LMICs, country- and region-specific resource constraints also play a major role. Thus, few applicants have opportunities to obtain formal training or mentorship in proposal writing.

In addition, when researchers in LMICs join cross-regional or global research consortia, their lack of confidence and resources often creates a power dynamic that prevents them from taking a primary role in communicating with funders. It is incumbent on funders and research organizations globally help redress this imbalance. One way to do so is to encourage and enable researchers in LMICs to participate as equal partners in proposal design and specification, while clearly specifying what a robust, responsive grant proposal must include.

The key ingredients of successful IR proposals

Proctor et al. (2012) list ten key elements of comprehensive IR proposals that can be adapted to fit specific programs. What is crucial is that funding announcements clearly convey the specific review criteria that will be used and how these will be weighted. It might help funders to think of writing funding announcements using the kinds of concepts and terminology that they would like to find in the funding proposals that they receive. That is, funders should clearly state what they are looking for in terms that applicants can easily understand and respond to when writing proposals (see Case study 6.1).

Funders and research organizations can support and develop workshops, certificate or degree programs and other forms of training to help teach early- and mid-career researchers how to write grant proposals that are tailored to program specifications (for information on funder-sponsored training, see Appendix 2).

Consider developing and sharing proposal evaluation tools

Clear criteria also help funders to evaluate proposals. While every funder should consider how flexible they can be in evaluating IR proposals, some tools are available for standardizing the evaluation process by using a quantitative scoring rubric. One such tool was developed and tested by Crable et al. (2018). Funders that prefer not to standardize proposal evaluations in this way will nevertheless find that communicating clear criteria or specifications in calls for grant proposals tends to yield more robust and relevant proposals.

Case study 6.1 | Providing clear criteria in a call for grant proposals

In the 2015 call for grant applications mentioned in Case study 1.1, the Global Alliance for Chronic Diseases (GACD) and the NIH's National Heart, Lung, and Blood Institute (NHLBI), clearly stated that they wanted grantees to make IR a core aspect of all proposals. Extracts from the call for applications below show how the funders specified the IR-related criteria that they planned to use when evaluating applications. The criteria aligned with both the NIH's evolving IR goals and the overarching goals that GACD had defined for the program.

> The NIH expects that applications will propose an implementation research study focused on an aspect of delivering, scaling up, or sustaining proven-effective, evidence-based interventions at the population level for prevention and management of hypertension.
>
> Applications *are expected to build on evidence-based interventions (including evidence of cost-effectiveness and affordability) for the respective population groups under defined contextual circumstances* and to replicate and scale-up comprehensive interventions. Interventions can focus at the individual, community and/or system level and may combine interventions from different levels. They may target strategies for the sustainable scale up of proven-effective interventions for the prevention, treatment, and control of hypertension.
>
> Applications are expected to *provide strong evidential support that the selected interventions are equitable, safe, effective, and efficient, and include assessments of accessibility,* reach, and affordability as an integral part of the proposed research.
>
> This funding opportunity announcement is intended to support applications that propose to:
>
> 1) employ validated theoretical or conceptual implementation research frameworks...;
> 2) include implementation research study designs (e.g., experimental, quasi-experimental, observational, modeling, cluster randomization, stepped-wedge, Type III hybrid effectiveness, etc.);
> 3) include implementation measures as primary research outcomes (e.g., acceptability, adoption, appropriateness, affordability, costs, feasibility, fidelity, penetrance, sustainability, etc.); and
> 4) inform understandings of key mediators and mechanisms of action of the implementation.

From this, it is clear that the elements of IR deemed necessary for funding applications to be successful were: an appropriate theoretical framework, project design that was relevant to a real-world setting, specific IR outcomes and key mediators that might affect these outcomes. Inclusion of these elements should help applicants write stronger proposals and reviewers to assess grant proposals fairly and transparently.

Source: https://grants.nih.gov/grants/guide/rfa-files/RFA-HL-20-005.html (emphasis added).

Approach 7: Embed implementation research into health systems

> Measure seven times, cut once.
>
> – Armenian proverb

Ultimately, for any investment in IR to be worth the resources it consumes, its outcomes must be envisioned and designed to become an integral part of health and other social systems wherever possible. Funders can help to make this happen by ensuring that IR practitioners' engagements with health policy and related realms are a key component of IR investments in LMICs.

Support projects that embed IR skills in health systems

Relying on external sources of funding is unlikely to successfully embed IR in national and local health systems in LMICs. A key question in IR is whether a given treatment works and is implementable. The answer to this question is highly specific to each country, and can even differ within sub-national regions. Yet, it is seldom possible to run external trials that cover every area. However, if IR skills are embedded in the system, it becomes possible to connect local realities to national and even global networks. Funders and research institutions should therefore prioritize extending their support to projects that are designed to take IR skills into the overlapping streams of activity that together constitute health systems (see Case studies 7.1 and 7.2).[5]

Facilitate exchange between researchers and policymakers

Practical and productive dialogue between researchers (who approach IR as an academic endeavor) and government decision-makers (who have the power and influence to carry academic research into policy formulation and embed it in health systems) is critical. For more on this, see Case study 7.3.

Funders and research institutions can advance the goal of embedding IR in health systems by supporting research programs that identify the systemic causes of ill health. Funders can also foster the establishment and expansion of academic-political networks that keep these relationships open and transparent, enabling those involved to remain accountable to the citizens they serve.

Fund research on how IR can influence health policies

The field of policy dissemination and implementation research (policy D&I) exists to help expand and enhance the use of evidence-based research in policymaking. Funders can invest in policy D&I as part of a broader approach that aims to embed the fruits of IR within health systems. So far, the data on funded policy D&I projects is scant but what does exist suggests that its benefits are considerable. Policy D&I funding channelled through the US NIH's D&I-focused funding announcements from 2007 to 2014 totalled US$16 177 250. This is equivalent to 10.5% of all grants funded through D&I announcements in that period (Purtle et al. 2016). While this level of funding is by no means within reach of most LMICs, the figure provides a useful reminder of the massive disparities in research funding across the globe.

First do no harm

The US's National Cancer Institute and NIH have begun to look at *de-implementation* research, which focuses on 'reducing or stopping the use of a health service or practice provided to patients by healthcare practitioners and systems'. This also points to the importance of integrating IR into

5 For the latest news and publications on health systems and IR, see https://www.who.int/tdr/diseases-topics/health-systems-implementation-research/en/. For additional resources, see also Appendix 2.

health systems. As Norton, Kennedy et al., (2017) observe: 'De-implementing ineffective, unproven, harmful, overused, inappropriate and/or low-value health services and practices is important for mitigating patient harm, improving processes of care and reducing healthcare costs'. See Case study 7.4 for more on this issue.

Case study 7.1 | Shifting focus from global to local and from urban to rural

Informed by WHO guidelines, the Baby-Friendly Hospital Initiative (BFHI) was developed to help train nurses and other health practitioners to deliver breast-feeding training and other aspects of neonatal care to new mothers.

However, while running the project, the principal investigator realized that, in very rural settings, few mothers go to a hospital during their pregnancies and most births happen with the help of village-trained midwife equivalents. The project implementation was then changed and the hospital-based initiative was transformed into a community-based practice, the Baby Friendly *Community* Initiative (BFCI).

The overall aim of the program is to promote breastfeeding, complementary feeding and maternal nutrition using locally available foods, and to improve sanitation and hygiene. In shifting the focus of the program, training methods had to be changed to communicate effectively with midwives instead of nurses, and to give midwives and mothers opportunities to share what they already knew.

When a randomized control study was run to assess the program, researchers found that children whose mothers had been visited by the village midwives had significantly better meal frequency and dietary diversity even in the provision of a minimally acceptable diet. A new guideline was created using this information and shared with the government of Kenya. The Kenyan government is now funding the training of village midwives across the country.

Case study 7.2 | Seeing the benefits of IR in primary health care

The Doris Duke Charitable Foundation's African Health Initiative (AHI) was designed to catalyze significant advances in health systems by supporting partnerships that design, implement and evaluate large-scale models of care that link IR and work-based training to the delivery of integrated primary health care in sub-Saharan Africa (see Hirschhorn et al. 2017).

Linked to this, Bawah et al. (2019) published an article on AHI-supported IR research in Ghana, showing that 'a comprehensive approach to newborn care is feasible if care is augmented by community-based nurses.'

The study supports the assertion that if appropriate mechanisms are put in place, child mortality is reduced and survival accelerates. Bawah et al. concluded that the 'policy implications of the pronounced neonatal effect…merit national review for possible scale-up'.

Case study 7.3 | Facilitating dialogue between researchers and policymakers

The Lerner Center for Health Promotion supported a study by Jessani et al. (2018) to investigate the factors that affect engagement between academics at Johns Hopkins School of Public Health and decision-makers at the city, state, federal and global government levels.

Their findings suggest that, even in this exceptionally well-resourced institution, the school of public health could enhance the relevance of its role in health policy decision-making by:

- Periodically measuring engagement with decision-makers.
- Enhancing individual capacity in knowledge translation and communication, taking faculty characteristics into account.
- Institutionalizing a culture that supports policies and practices for engagement in decision-making processes.
- Creating an approach to expand and nurture trustworthy and honest networks and relationships with decision-makers.

Case study 7.4 | Reducing ineffective, unproven, harmful, or low-value health services and practices

From 2000 to 2017, Norton, Kennedy et al. (2017) systematically identified and tracked 20 de-implementation research grants funded across the US's NIH.

They recommended:

- Raising the profile, clarifying the conceptual bases and means of measuring research on the de-implementation of practices related to, for example, over-screening for breast, cervical and colorectal cancers.
- Collaborating with and supporting the efforts of stakeholders involved in ongoing initiatives and campaigns related to de-implementation in health, such as the Choosing Wisely campaign and the Canadian Deprescribing Network.
- Leveraging forthcoming policy and practice changes as an opportunity to conduct embedded research on de-implementation relating to the opioid crisis in the US, the UK and Canada, as well as the global anti-microbial resistance crisis.

Appendix 1: Additional definitions of implementation research

This is by no means an exhaustive list, but these definitions might provide additional reference points for funders and research institutions that are incorporating IR into their core strategies and/or funding programs and applications.

Implementation research is:

- Any research producing practically usable knowledge (evidence, findings, information, etc.) which can improve program implementation (e.g., effectiveness, efficiency, quality, access, scale-up, sustainability) regardless of the type of research (design, methodology, approach) falls within the boundaries of operations research (Global Fund et al. n.d.: 11).
- A subset of health systems research [that] focuses on the interaction between an intervention or program and its context. It looks at how various aspects of the health system such as financing, information systems, government leadership and community engagement function, interact and affect the piloting of new, and the scaling up of promising, health and social programs. It requires the engagement of a wide range of stakeholders across different sectors and draws on multiple disciplines in order to address complex implementation challenges (IDRC, from Peters et al. 2013).
- The study of methods to promote the adoption and integration of evidence-based practices, interventions and policies into routine health care and public health settings. IR plays an important role in identifying barriers to, and enablers of, effective global health programming and policymaking, and leveraging that knowledge to develop evidence-based innovations in effective delivery approaches (NIH's Fogarty International Center).
- The study of methods to improve the uptake, implementation and translation of research findings into routine and common practices (the 'know-do' or 'evidence-to-program' gap) (Padian et al. 2011: 199).
- A specified set of activities designed to put into practice an activity or program of known dimensions. According to this definition, implementation processes are purposeful and are described in sufficient detail such that independent observers can detect the presence and strength of the 'specific set of activities' related to implementation. In addition, the activity or program being implemented is described in sufficient detail so that independent observers can detect its presence and strength. When thinking about implementation the observer must be aware of two sets of activities (intervention-level activity and implementation-level activity) and two sets of outcomes (intervention outcomes and implementation outcomes) (Fixsen et al. 2005: 5).
- The scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services. It includes the study of influences on healthcare professional and organizational behavior' (Eccles and Mittman 2006: 1).

Appendix 2: Some training opportunities and other useful resources

This list is not intended to be comprehensive but, rather, to indicate the range of opportunities available.

Training opportunities

- **Workshops.** Each year, GACD conducts two, 2-day IR workshops and, since 2018, has offered an annual 5-day IR school. Hosted by various GACD member agencies, the workshops cater to researchers of varying levels of experience, and aim to build expertise among researchers in anticipation of future funding calls. Since 2014, GACD has trained over 450 researchers, 53% of whom are from LMICs. Information about the 2-day workshops is available at https://www.gacd.org/research/implementation-science-capacity-building.
- **Online training.** The Training Institute for Dissemination and Implementation Research in Health (TIDIRH) has an open-access online training course to support researchers' efforts to access IR funding. The training is open to researchers with interests in studying dissemination and IR across health care, public health and community settings. More information on this is available at https://cancercontrol.cancer.gov/IS/training-education/tidirc/openaccess.html.
- **Networking and an annual forum.** Focusing on HIV transmission among adolescents in sub-Saharan Africa, the Adolescent HIV Presentation Treatment and Implementation Science Alliance (AHISA) offers its members ongoing communication and networking platforms as well as an annual forum. More information is available at https://www.fic.nih.gov/About/center-global-health-studies/Pages/adolescent-hiv-prevention-treatment-implementation-science-alliance.aspx.
- **Postgraduate training and support.** TDR, the Special Programme for Research and Training in Tropical Diseases, is a global program of scientific collaboration that helps facilitate, support and influence efforts to combat diseases of poverty. It is co-sponsored by UNICEF, the UNDP, the World Bank and WHO. TDR-funded postgraduate training has moved away from the model of sending people from LMICs to be trained in high-income countries. Instead, TDR is investing in strengthening institutional capacity for IR by supporting a network of seven universities worldwide. More information is available at https://www.who.int/tdr/capacity/strengthening/postgraduate/en/.
- **Massive open online course.** TDR runs an open online course on IR, with a focus on the 'infectious diseases of poverty'. The course provides step-by-step online training for public health researchers and decision-makers, program managers, academics and others. It focuses on how to design and demonstrate robust IR projects to improve control of infectious diseases of poverty and generate better health outcomes. The course is free and open to anyone who wants learn how to propose and investigate local solutions to health problems in their country, as well as connect with peers around the world. More information is available at https://www.who.int/tdr/capacity/strengthening/mooc/en/.

Online resources

- **TDR's IR Toolkit.** This comprehensive toolkit is organized into seven modules to help healthcare providers, program managers, policy makers and researchers to identify barriers to research implementation and to formulate research questions; make a case for funding; set up a study design with appropriate methodologies; plan the study (budget, personnel, timelines, monitoring and evaluation); collect and analyze research information; develop a dissemination plan and monitor and evaluate progress. The toolkit is available online at http://adphealth.org/irtoolkit/ and https://www.who.int/tdr/publications/topics/ir-toolkit/en/.
- **The FIC's IR Toolkit** for researchers, policymakers and program implementers, *Overcoming Barriers to Implementation in Global Health: A Toolkit for Engaging Diverse Stakeholders in Implementation Science.* This toolkit provides resources to help strengthen stakeholder interactions, community participation and IR. It includes models, frameworks, strategies and approaches that are relevant and appropriate for LMICs.
- **For regularly updated IR-related news, resources and funding calls**, see the FIC's website at https://www.fic.nih.gov/ResearchTopics/Pages/ImplementationScience.aspx.
- **ACCORDS** (Adult & Child Consortium for Health Outcomes Research & Delivery Science) at Colorado University Medical School, regularly updates their website with resources for IR proposal development, manuscript writing and training. The site also has a range of news and links to relevant journal articles, etc. The site is at https://medschool.cuanschutz.edu/accords/cores-and-programs/dissemination-implementation-science-program/getting-funded-DandI.

Frequently used acronyms and abbreviations

ART	antiretroviral therapies
DFID	Department for International Development (UK)
EDCTP	European & Developing Countries Clinical Trials Partnership
FIC	Fogarty International Center (US)
GACD	Global Alliance for Chronic Diseases
HEARD	Health Evaluation and Applied Research Development
IDRC	International Development Research Centre (Canada)
iKT	integrated knowledge translation
IR	implementation research
LMIC	low- and middle-income countries
NGO	non-governmental organization
NHLBI	National Heart, Lung, and Blood Institute (NIH, US)
NIH	National Institutes of Health (US)
NISA	Nigeria Implementation Science Alliance
Sida	Swedish International Development Cooperation Agency
TDR	Special Programme for Research and Training in Tropical Diseases
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

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