

Implementation Research: New Imperatives and Opportunities in Global Health

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Abstract

Implementation research is important in global health to address the challenges of the know-do gap in real world settings, and the practicalities of achieving national and global health goals. Implementation research is an integrated concept linking research and practice to accelerate the development and delivery of public health approaches. It involves the creation and application of knowledge to improve the implementation of health policies, programmes, and practices. It uses multiple disciplines and methods, and emphasises partnerships between community members, implementers, researchers and policy makers. Implementation research focuses on practical approaches to improve implementation; to enhance equity, efficiency, scale up and sustainability, and ultimately to improve people's health. There is growing interest in the principles of implementation research, and a range of perspectives on its purposes and appropriate methods. However, there have been limited efforts to systematically document and review learning from the practice of implementation research across different countries and technical areas. Drawing on an expert review process, this paper presents purposively selected case studies to illustrate the essential characteristics of implementation research and its application in low and middle-income countries (LMICs). The case studies are organized in four categories related to the purposes for using implementation research: impacting people's health, informing policy design and implementation, improving health service delivery, and empowering communities and beneficiaries. Common characteristics of these case studies are the focus on addressing implementation problems, ensuring a partnership approach to the co-creation of solutions, including using tacit knowledge, and commitment of key stakeholders to a pathway towards impact. The case studies reveal the complex adaptive nature of health systems, emphasize the importance of understanding context, and highlight the role of multidisciplinary, rigorous and adaptive processes which allow for course correction to ensure interventions have an impact. This

paper is part of a call to action to increase the use of implementation research in global health, build the field, and accelerate efforts to bridge the gap between research, policy, and practice to improve health outcomes.

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Panel 1: Key messages

1. Implementation research offers a way to understand and address implementation challenges and make a positive impact on people's health by contributing to building stronger and more responsive health systems within the realities of specific contexts.
2. Implementation research can lead to positive health outcomes, inform policy design, improve health management and service delivery, and support and empower communities and beneficiaries.
3. Implementation research uses multidisciplinary approaches and a range of empirical and systematic methods to document, analyse and address key health problems and test technical health interventions as well as contextually tailored innovative strategies within the foundations of local context.
4. Implementation research can be used to evaluate the feasibility, adoption, and acceptance of interventions, as well as coverage (particularly in reaching disadvantaged groups), quality, equity, efficiency, scale, and sustainability.
5. Implementation research involves an approach to doing research that fosters ownership, collaboration, and influence; policy-makers, implementers, communities, and researchers should work together throughout the research and implementation processes to build trusting partnerships and the co-production of knowledge.
6. Implementation research involves some key trade-offs to consider: (i) rigor versus usefulness of the research; (ii) fidelity versus adaptation of an implementation component; (iii) embedded versus externally objective approaches; (iv) seeking generalizable knowledge versus context-specific problem-solving; (v) incentives versus disincentives for researchers and implementing agencies.

Introduction

In global health, many specific interventions have been shown that they can be effective at low cost in relatively controlled environments, in short-term studies, or on small scales.¹ But building strong and responsive health systems that promote health and well-being through sustainable strategies that work on a significant scale remains a critical challenge, particularly in low and middle-income countries (LMICs).

Internationally, the need for implementation research could not be greater or timelier. The Sustainable Development Goals (SDGs) and national commitments for universal health coverage require effective implementation of proven interventions to improve health outcomes and ensure that no one is left behind. Implementation research provides a set of approaches, methods, tools

and ways of bridging research and practice to address these issues. Implementation research offers a renewed focus on how to accelerate the development and delivery of services that improve and sustain health and well-being for all, including the most disadvantaged.

The aim of this paper is to present the characteristics that define implementation research and their application in global health through case studies. We demonstrate how evidence can inform practice, and the potential of implementation research to make an impact across different contexts and implementation problems using a range of research methods in LMICs. The case studies highlight contexts where there are heightened challenges to achieving the Sustainable Development Goals and universal health coverage.

Panel 2: *Researchers are from Venus, policy-makers are from Mars*

Policy-makers, funders, implementers, researchers, and community members each view problems differently. Wendy Graham of Aberdeen University famously characterized it as, “researchers are from Venus and policy-makers are from Mars”.² She, however, wisely recruited Dr. Sam Adjei for a time to advise her. Sam, who died in 2016³, had an illustrious career bridging these two worlds and was an inspiring champion of the potential of an implementation research vision in Ghana and internationally. He set up the The Ghana National Health Research Unit (HRU) to promote, institutionalize, coordinate and conduct health systems and operational research focused on the utilization of research results. Today, it has transformed into a Division in the Ghana Health Service with three vibrant internationally recognized field research centres, ensuring that health research is responsive to country needs and priorities.

Defining implementation research

Implementation research builds on a number of research traditions, and each of these research traditions has developed its own set of core disciplines, primary audiences for their research, and typical sets of research questions (Table 1).⁴ In part due to the “invisible colleges” that have formed from the different traditions, the field of implementation research in health has yielded considerable debate over its scope, theories and methods, terminology, and areas of emphasis (see Panel 3). Whereas we recognize the value of these debates, we use a broader and more

inclusive definition of implementation research that emphasises the unifying focus of the varied histories and disciplines: “the scientific inquiry into questions concerning implementation—the act of carrying an intention into effect, which in health research can be policies, programmes, or individual practices.”⁴ Implementation research is about using systematic research methods to improve policies and program delivery, and knowledge translation, preferably through real-time application of knowledge gained into real-world programmatic change.⁵ It addresses a range of implementation challenges, including inefficient or inequitable use of resources, inequity in coverage or supply and demand barriers to scaling-up and sustainability.⁵ Implementation research is a convergence of approaches better known in high income countries in the fields of management, education, social and health services.^{4,6,7} Implementation research emphasizes attention and dynamic adaptation to local context, stakeholders, local care resources, and end user engagement in understanding how and why change processes work.⁸

Table 1: Implementation Research Traditions and their Typical Research Targets, Research Questions, and Initial Core Disciplines (from Peters et al, 2013⁴)

Implementation Research Tradition	Typical primary audience for research	Typical research questions	Core disciplines at origin
Management improvement	Managers and teams using improvement strategies	How are the right services delivered to the right clients while meeting the right standards for quality?	Engineering, management
Operational research	Executive decision-makers (executive bodies, policy-makers)	Which solution provides the most rational basis for a decision concerning the optimal performance of a system?	Mathematics, engineering, management
Policy implementation	Top down: Central level policy-makers Bottom up: “Street level” programme implementers	Top down: How was a policy/programme implemented, and what contributed to its outcomes? Bottom up: Which actors are involved in programme delivery in specific locations, how do they understand the problem of implementation, and what	Political science, public policy, public administration

Implementation Research Tradition	Typical primary audience for research	Typical research questions	Core disciplines at origin
		influences their behaviour?	
Programme evaluation	Stakeholders of a programme (e.g. funders, implementers, and/or intended beneficiary)	Is the programme producing intended effects? How is it designed, implemented, used, fit to context and problems, with what results and programme changes?	Sociology, public policy, economics, social work, psychology
Dissemination and implementation of evidence-based medicine	Practitioners, health organization managers, policy-makers not using evidence-based interventions	What promotes the integration of research findings and evidence on interventions into healthcare practice?	Behaviour change (psychology, sociology, education), epidemiology
Participatory action research	Research participants, community members	How can we (community members as research participants) learn and be empowered to take action?	Non-disciplinary or trans-disciplinary, but largely influenced by social psychology, education, and anthropology

Panel 3: Implementation research: What's in a name?

The divergent histories and disciplines that have addressed implementation questions continue to stimulate much debate over terminology, theory, and methods. For many who are largely interested in effective implementation, it is often difficult to distinguish whether these debates signal any progress in understanding as the science advances, or are simply the territorial markings of different research “tribes” or “invisible colleges”.²

Although it is one of the more recent research traditions, the emergence of evidence-based medicine has spawned a branch of implementation science that now dominates the clinical literature, defining implementation science as 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 and care.”³ Within this tradition, an attempt was made to provide consistent definitions for the field, which the authors called “Dissemination & Implementation Research”.⁹ Yet by 2015, a literature review of definitions for implementation science that just focused on HIV/AIDS identified 73 different definitions for the term, mostly from this same tradition.¹⁰ The results prompted the authors to expand the definition of implementation science as a “multidisciplinary specialty that seeks generalisable knowledge about the behaviour of stakeholders, organisations, communities, and individuals in order to understand the scale of, reasons for, and strategies to close the gap between evidence and routine practice for health in real-world contexts”.¹⁰

A comparison of the different strands of research traditions that study implementation (e.g. operational research, scientific management, policy and programme evaluation, participatory action research, in addition to the dissemination of evidence-based practices) suggests they have much in common with the

expanded definition, though some fields have a broader scope (e.g. to include policy and programmes beyond “practice”) or include specific methods, since “evidence” has different connotations in different fields.⁴ Other research traditions do not focus solely on generalisable knowledge, but also on the use of knowledge, or the interface of knowledge and action. Global health discussions have highlighted the importance of multi-disciplinarity, collaboration, real-world settings, problems of scale and sustainability, and the bi-directional links between practice and evidence,⁵ which motivates the use of terms such as “delivery science”¹¹ and “programme science”.¹²

Although the terms “science” and “research” are often used interchangeably, research is critical part of science, and involves the use of scientific methods to gather and analyse data to answer questions. Yet the term “research” can also be controversial to some organisations, and has practical consequences. For example, some Universities may consider activities to be research only when the work is intended for publication (or more broadly to produce generalisable knowledge), or when there is a specific sponsor for the activity. This may distinguish formal research from problem-solving activities, even when they use the same research methods. Similarly, some funded projects are categorized as quality improvement or public health practice rather than more traditional human subjects research. This may result in different types of ethical review of the protocols, depending on how the activity is classified.

Conducting research is also problematic for agencies that do not have a research mandate; in global health, this could include GAVI, UNICEF, The Global Fund, and many public health agencies. Because they often need robust information about their programmes and are often expected to use robust monitoring and evaluation, they classify their activities as non-research activities, sometimes as monitoring and evaluation, learning, or occasionally as operations research. They also use different funding mechanisms for these activities. We propose that all these activities may be considered implementation research when robust scientific methods are used to answer questions related to implementation. This still means there is a need to carefully ask relevant questions and apply appropriate theories and methods to the problem.

Although we do not advocate for a single theory among the many theoretical frameworks in the field, there are some particularly useful meta-frameworks that bridge theories and help to identify more specific theories and methods that can fit a particular question or context. These include the Consolidated Framework for Implementation Research,¹³ the National (US) Implementation Research Network’s Active Implementation Frameworks (Usable interventions, Implementation stages, Implementation drivers, Implementation teams, and Improvement cycles),¹⁴ a synthesis of frameworks on implementation processes,¹⁵ and an analysis of models according to a socioecological framework to help identify and select relevant frameworks.¹⁶ There are also many helpful handbooks, including WHO’s introductory *Implementation Research Guide*,¹⁷ and the STaRI statement on how to report implementation research.¹⁸

In global health, much of the effort has been placed on building bridges: across knowledge producers, consumers, and beneficiaries; policy-makers, funders, programme implementers, and analysts; and across traditions of research, monitoring and evaluation.⁵ Learning from formally designed research projects, adapting robust research methods for local problem-solving and monitoring, and approaches to systematize tacit knowledge and experience are all used to “make more informed decisions and produce consistent results on the ground”.¹⁹ Ultimately implementation research is intended to improve people’s health through more informed policies,

strengthened service delivery, empowered communities, more capable programme implementers and health providers, and more informed policy-makers.

Methods to synthesise learning on implementation research

Multiple case studies of implementation research projects in differing LMIC contexts were selected and analysed within a framework of core characteristics of implementation research.

The framework and selection of case studies in this paper was informed by a set of five structured and consultative international meetings held between 2012 and 2016 (see panel 4) bringing together researchers, donors and policy-makers to identify problems and opportunities related to implementation research, build consensus in describing the field, showcase useful examples and develop priorities for action.

The case studies included here were purposively selected through a process of inclusive debate enabled by these meetings (Panel 4) to illustrate common characteristics of implementation research (Table 2) and to show its relevance in a range of geographical and political contexts, implementation topics and questions, scale of implementation (from continent wide to national to local), disciplines and methodologies and types of impact. Impact types include: i) on people’s health; ii) on policy design and implementation; iii) improving health management and service delivery and iv) supporting and empowering communities and beneficiaries.

Table 2: The defining characteristics of implementation research applied in global health

Context – specific	Contextualisation of an intervention in implementation research, hence the detail of context is made explicit, alongside level of analysis and action e.g. community, district, national. Attention is paid to the differences in need for, and benefit from interventions depending on gender or other social strata.
Purpose - relevant and agenda setting	Identify and address challenges related to any implementation decisions or processes at any level including: identifying and addressing current health problems; agenda-setting; priority-setting; commitment-building at all levels;
Methods fit for purpose	Research design responsive to an implementation problem or question, typically a range of data sources and methods are used

	as appropriate for the implementation questions, decision context and community or patient characteristics being sensitive to gender and other social stratifiers.
Demand driven	Research questions are framed or based on needs identified by implementers, intended beneficiaries, and/or policy-makers and research consumers in the health system
Multi-stakeholder and multidisciplinary	Democratization of research: Implementers, policy makers and researchers (and often also communities, including the most marginalised) to co-produce the research, co-create solutions, and use the results together drawing on multiple disciplines (e.g. management, psychology, sociology, education, epidemiology, anthropology, engineering, political science, and economics). Importance of leadership or partnership of national scientists
Real world	Not usually under controlled trial conditions (but can be part of pragmatic trials with process and context assessment running alongside), and usually working within the reality of implementing organizations, communities, and financing systems, and within the context of health systems that are changing and adaptive.
Real time	Implementation research is designed to provide evidence or solutions through short feedback loops that can be used for real time improvements and/or course-correction in implementation and/or periodic reflection, dynamic, non-linear, iterative, and evolving process.
Focuses on processes as well as outcomes/impact	Implementation research is focused on processes and engage implementers to and documents how interventions are implemented and delivered to assess acceptability, fidelity, adoption, scale up and impact. Tacit knowledge is used and acknowledged.

Sources: Authors. Informed by expert review process and adapted from Peters *et al*¹⁷; Cape Town statement, 2014⁵

Panel 4: Meetings on Implementation Research that informed the case studies

The approach involved the identification of multiple case studies of implementation research projects in differing LMIC contexts, analysing these within a framework of core characteristics of implementation research adapted from the literature.^{5,17} The selection of case studies in this paper has been informed by a set of structured and consultative international meetings which aimed to bring together different stakeholders with an interest in implementation research in LMICs to identify problems and opportunities related to implementation research, build consensus in describing the field, showcase useful examples, and develop priorities for action. This series of meetings include: Developing and finalising the Guide “Implementation Research in Health: A Practical Guide” (Geneva, 2012)¹⁷; consultations on the priorities for statement on IRDS (Washington, April 2014 & Accra, July 2014); launch of the “Statement on Advancing Implementation Research and Delivery Science” at the Health Systems Global Conference (Cape Town, October 2014); and two paper writing workshops (Washington, November, 2015 and Montreux April, 2016). The statement in Cape Town⁵ also involved a web statement that different stakeholders (e.g. health managers, donors, researchers) and their institutions signed up to, with actions to take forward the field.

We have structured the case studies against this classification of impact in order to showcase a range of implementation research examples at different levels of the health system (Table 3).

Table 3: Applying the defining characteristics of implementation research to the case studies

CASE	CONTEXT-SPECIFIC	PURPOSE - RELEVANT AND AGENDA SETTING	METHODS FIT FOR PURPOSE	DEMAND DRIVEN	MULTI-STAKEHOLDER AND MULTIDISCIPLINARY	REAL WORLD	REAL TIME	FOCUSES ON PROCESSES AS WELL AS OUTCOMES/IMPACT
IMPLEMENTATION RESEARCH THAT HAS POSITIVE HEALTH IMPACT								
SMALL POX ERADICATION	Nigeria, working specifically with affected villages within the context of a nationwide strategy	Addressed the challenge of small pox outbreak when there was not enough vaccine to use the standard national mass vaccination strategy	“Field research” involving “ring-fenced” immunization and active surveillance in communities where new cases occurred.	Health providers identified the problem	Co-creation with implementers and researchers tightly linked, and dependent on and supported by community participation in surveillance	Working with affected Nigerian communities and with the health system	Implementation occurred alongside and in response to the small pox outbreak	Contributed and built the processes for an effective eradication strategy despite resource constraints; similar strategies adopted later in the Ebola response
NEONATAL MORTALITY DUE TO BACTERIAL INFECTION	Urban and peri-urban, and rural settings in Bangladesh, Pakistan, DR Congo, Kenya, Nigeria	Systematic process from validation through introduction of new approach to increase access and ensure safety of lifesaving antibiotic treatment for sepsis	Range of methods adjusted over time including clinical assessments of impact of two days of injectable antibiotics and 7 days of oral antibiotics and quality improvement	The IR process responds to need for alternative approaches to address bacterial infection, that are acceptable to communities	Implementers, policy makers, and researchers in ongoing dialogue on evolution to co-creation of solutions in later stage	A locally developed service package was tested using usual management arrangement, followed by further adaptation in real world conditions	Initially no, but later stage effort increasingly so	Assessment and sharing of learning across contexts to inform country level and global uptake; Bangladesh has adopted WHO guidelines and ongoing iterative process of assessment to inform scale up
IMPLEMENTATION RESEARCH THAT INFORMS POLICY DESIGN AND IMPLEMENTATION								
GHANA-COMMUNITY	Ghana, nationwide	Identified the importance of	The original research	In response to policy	Policy makers, program	Working within	Ongoing research to	Demonstrates the process and

CASE	CONTEXT-SPECIFIC	PURPOSE - RELEVANT AND AGENDA SETTING	METHODS FIT FOR PURPOSE	DEMAND DRIVEN	MULTI-STAKEHOLDER AND MULTIDISCIPLINARY	REAL WORLD	REAL TIME	FOCUSES ON PROCESSES AS WELL AS OUTCOMES/IMPACT
BASED HEALTH SERVICES	process to promote scaling up approaches	supporting, sustaining the scaling up of community based health services	showed the intervention works and how to go about it. However there was no research to support how to scale up in context.	maker concern over how to effectively implement community based health services and address the failures of preceding VHW programs	implementers and politicians went through an interactive and engaging process to set the agenda and follow the progress of the research and translate knowledge into national policy and program	programme realities through an ongoing iterative process	inform processes of scale up in real time	impact of scaling up throughout the country through experimentation, multiple validations, and adaptation.
AFGHANISTAN-BALANCED SCORE CARD	Afghanistan, nation wide approach with pilots in different districts	Responding to the need to provide and assess the provision of basic package of health services across the country	Serial health facility surveys, cluster randomized trial, and process evaluation	Linked to both government priorities and to both government and NGO interventions	Involved government, NGOs and researchers	Working within the realities of different districts in this fragile and conflict affected state	Developing, implementing and assessing basic package of health services in real time	Documented process of developing balanced score card; impact including being part of the evidence base for dropping user fees
MULTI-SECTORAL NUTRITION APPROACHES TO REDUCE STUNTING	Working within national processes and collaborations in Ethiopia, Uganda, Burkina	Addressed the need for joined up approaches between actors and sectors to make impact on nutrition across different	Engaged, embedded action research/developmental evaluation of national policy implementation. Method deliberately chosen to	Actively responding to the need for more joined up approaches identified in county and globally	Researchers, policy makers and practitioners from different sectors interacting in formal and informal venues to address immediate and longer-term system needs	Led by implementers with support from researchers from project lead team	IR driving the promotion of multisectoral approaches for joined up action on malnutrition & stunting	Addressed numerous bottlenecks in real-time and identified three critical investments that appear necessary in the long run, to build and sustain effective MSN

CASE	CONTEXT-SPECIFIC	PURPOSE - RELEVANT AND AGENDA SETTING	METHODS FIT FOR PURPOSE	DEMAND DRIVEN	MULTI-STAKEHOLDER AND MULTIDISCIPLINARY	REAL WORLD	REAL TIME	FOCUSES ON PROCESSES AS WELL AS OUTCOMES/IMPACT
	Faso and Mali	country contexts	support commitment building and co-creation of solutions					systems to reduce stunting
IMPLEMENTATION RESEARCH THAT IMPROVES THE MANAGEMENT OF PROGRAMS AND ENHANCES SERVICE DELIVERY								
DISTRICT HEALTH SYSTEMS UNDER CONSTANT AND CHANGING CHALLENGE	South Africa, Tanzania, Ghana, Uganda and Nepal	All the projects and processes supported the strengthening and building of quality and more responsive health systems at the district level	Action research and processes of co-learning between researchers and implementers to support co-creation of solutions	All IR processes responded to the expressed need for health systems strengthening at the district, where health systems are arguably realized	Partnerships between district health management teams, managers, health facility management committee and researchers, in some cases including sectors beyond health. Policy-makers involved throughout	Working within the resource constraints at district level	In real time - in Nepal the IR approach facilitated an immediate research response following the earthquake, a halt to implementation of the management system and a refocus on how best to support health workers responding to the crisis.	Demonstrated across different contexts and projects that strengthening approaches can enable impact and action even in remote and challenging contexts. The partnerships required for change are documented.
RESPECT FOR MATERNITY CARE	Kenya, Tanzania and global level dialogue	Responding to a problem that has too often ignored in the health system in LMIC and industrialized countries	Problem scoping followed by identification of multi-level intervention	Responsive to unaddressed problem	Dialogue and evolving partnerships to address complex multi-dimensional problem	Working in program realities with co-learning & implementation of policy makers,	Ongoing with service delivery	Documentation and development of tools for introduction and scale up for countries as well as other settings

CASE	CONTEXT-SPECIFIC	PURPOSE - RELEVANT AND AGENDA SETTING	METHODS FIT FOR PURPOSE	DEMAND DRIVEN	MULTI-STAKEHOLDER AND MULTIDISCIPLINARY	REAL WORLD	REAL TIME	FOCUSES ON PROCESSES AS WELL AS OUTCOMES/IMPACT
ICCM	Sub-Saharan Africa	Delivery of primary care service access barriers for child health in resource constraint areas	Multi-method observational and interventions studies to document and address delivery challenges	Focus on barriers to provision of essential services	Dialogue and engagement	researchers, and implementers Working in program realities	In real time in a number of settings	Extensive documentation for country specific and cross-country learning
IMPLEMENTATION RESEARCH EMPOWERING COMMUNITIES AND BENEFICIARIES								
ENSURING HIV AND AIDS TARGET INTERVENTIONS MEET THE NEEDS OF SEX WORKERS IN INDIA	India – Andhra Pradesh and Karnataka	Developing targeted interventions to respond to the sexual and reproductive health needs of an isolated and stigmatized group	Qualitative process evaluation of systematic use of a broad range of programme data	Focus on developing context specific strategies for groups identified as high risk	Involved NACP, NGOs, researchers and sex workers	Approach took place in an iterative manner	Development of targeted interventions in real time to respond to needs of sex workers	Ongoing iterative process of change – both processes and impact on HIV prevalence documented
ONCHOCERCIASIS	Districts level in Cameroon, in areas where co-endemicity with loiasis means new	Tested a new approach to addressing the spread and impact of onchocerciasis where traditional	Implementation approach to test out alternative implementation strategy (in partnership with	Responding to the need to identify the possibility of new treatments particularly in areas where	Brought together researchers and programme managers, and communities (through CDDs selected through community	Working within the realities of the control programmes and	Implementation and qualitative assessments concurrently with the testing of the new alternative approach.	Processes documented (including community choice) and high adherence leading to reduction in

CASE	CONTEXT-SPECIFIC	PURPOSE - RELEVANT AND AGENDA SETTING	METHODS FIT FOR PURPOSE	DEMAND DRIVEN	MULTI-STAKEHOLDER AND MULTIDISCIPLINARY	REAL WORLD	REAL TIME	FOCUSES ON PROCESSES AS WELL AS OUTCOMES/IMPACT
	approaches are required	approaches need adapting (due to co-endemicity with loiasis and severe adverse events).	community structures to support adherence over 10 weeks) with embedded qualitative research & community assessments	loiasis highly endemic	processes) and deployed different disciplines. Developing trusting relationships.	in partnership with community resources (community based drug distributors)		prevalence and infection rate, enhanced well-being and policy change

Implementation research that impacts people's health

Smallpox eradication. The smallpox campaign remains the only successfully completed global health eradication campaign to date. One of the most dramatic and effective uses of implementation research involved testing a new implementation strategy for smallpox eradication using real-time data. The purposeful application of different research approaches was critical to the smallpox campaign. This included research on different ways to deliver vaccines, such as the bifurcated needle invented in 1965 that enabled quick and efficient immunization of large numbers of people. But when it became apparent that there was a critical shortage of vaccines to be able to pursue the long-standing strategy against smallpox – national mass vaccination – “field research” (as it was known in the Smallpox Programme) was needed to test a novel implementation strategy. The new approach involved a surveillance containment or “ring vaccination”, whereby response teams rapidly moved into areas where there were newly identified cases and quickly vaccinated everyone in the affected villages to build rings of resistance around smallpox cases. Implementation research tracked the number of new smallpox cases over time, demonstrating how the new ring strategy led to an immediate decline in the transmission of cases in Nigeria over one high transmission season and then throughout the year. This led to the successful adoption of the ring strategy across West Africa and then around the world.²⁰ More recently, the ring strategy was adapted in an innovative way to test the effectiveness of a new Ebola vaccine during the recent Ebola epidemic in Guinea.²¹

Neonatal Survival. A more recent case involved the testing of locally developed packages of services to improve newborn survival on a large scale in several low-income countries. This case offers a lesson in how implementation research done in “real world” conditions using locally available resources can change practices on a large scale and demonstrate the lives saved. Sepsis or severe bacterial infection is a leading cause of neonatal death. Severe bacterial infection has a rapid onset and is difficult to definitively diagnose. Until recently the WHO

recommendation was limited to hospitalization and treatment with injectable antibiotics for 10-14 days. This is not feasible for many families in Africa and Asia.^{22,23} While hospitalization remains the WHO standard of care, a coordinated set of studies in Africa, Bangladesh and Pakistan established a new evidence base of implementation strategies for outpatient management, where necessary, which have been included in new WHO guidance.^{23,24} The simplest of these regimens involves two days of injectable antibiotics and 7 days of oral antibiotics with follow up. Rather than studying these new strategies in better funded settings or under conditions where research teams could control the quality of care, the studies were designed from the outset to address the realities of severely constrained resources, including limited qualified doctors and nurses and unreliable infrastructure, and were tested concurrently in five countries and across health system contexts.^{25,26} In Bangladesh, the government adopted the new WHO guidance as a result of their studies demonstrating how to achieve a 20% reduction in neonatal mortality. Following the principles of implementation research in global health, the government of Bangladesh is currently working with funding agencies, implementation groups and research partners to evaluate the broader effects of the adoption of the new guidelines, including evaluating the feasibility and safety of the new WHO guidelines in three different regions with different health systems, contexts and technical support. Reviews every three months will allow the refinement of the implementation process and planning for the national scale up.

Implementation research that informs policy

Ghana: The Community Health and Planning Services (CHPS) is the lowest level at which public health services are delivered in Ghana. CHPS started as a family planning research project and then transformed into an initiative aimed at locating primary care services in communities, and involving them in the decision-making process. The CHPS experience brings to the fore the practicality of scaling up a successful pilot throughout the country, and what it takes to put evidence into action through research, experimentation, multiple validations, and adaptation.

Between 1994 and 2000, country stakeholders went through an interactive and engaging process to pilot, experiment, replicate and scale up a programme that mobilized local volunteers, resources and cultural institutions to support community based primary care.²⁷ The original CHPS model was piloted through deploying nurses to the community and engaging local leaders, resulting in reductions in child mortality by half, maternal mortality by 40% and fertility by nearly a birth in only five years, compared to areas relying on existing services alone.²⁸ The key implementation research lessons to inform scale up were: the need to place nurses in home districts but not home villages; adapt to each district context; mobilize local resources; develop a shared project vision; conduct “exchanges” where staff can observe the model working in another setting; pilot the approach locally and expand based on lessons learned. Since 2000, the country has continued to gradually scale up the implementation of CHPS with both successes and challenges. A recent review by Krumholz et al (2015)²⁹ shows that the original scope of CHPS has been expanded which has increased access to health care; although some implementers are concerned that the original emphasis on community involvement does not have the same prominence as in the original study.

Afghanistan. The case of the development and use of a national Balanced Scorecard (BSC) on basic services in Afghanistan demonstrates how implementation research can be used to

immediately influence policy, as well as the limitations and potential consequences of the close links of research and policy. The BSC in Afghanistan is part of a monitoring system set up through multi-stakeholder engagement to regularly assess the delivery of a basic package of health services across the country. The BSC was used as a tool for regular re-planning of activities, reallocation of resources, and problem-solving,³⁰ and also provided a platform to test government and NGO policy innovations, such as contracting and health financing innovations.³¹ A cluster-randomized trial using the BSC was conducted to test different user fee options, and within days of the study being completed, the results were quoted by the Ministry of Public Health (MOPH) as a basis for dropping user fees at primary care facilities due to their negative effects on access, while failing to improve quality or raise significant funding.³² This was a policy the government had wanted to change and the research provided them with confidence to do so. More recently, when the same data collection system and revised scorecards were used to evaluate a pay-for-performance scheme that was shown to be ineffective,³³ the MOPH expanded the program anyway with World Bank support, and has not paid the evaluators for the work. The experience demonstrates that close collaboration between policy-makers and researchers can result in research that directly leads to policy change, particularly when the results are consistent with government ambitions. But there are also risks to researchers when they work closely with government and the results do not support government expectations about their policies.

Nutrition Systems. Implementation research has been used effectively to build and sustain multi-sectoral nutrition systems (MSN) across Ethiopia, Uganda, Burkina Faso and Mali by identifying critical investments required in these systems. Malnutrition is a major contributor to the global burden of disease in low-income countries, with more than 2 billion people affected by micronutrient malnutrition and 161 million children suffering from chronic undernutrition.²⁹ Establishing mutual understanding of the evidence of highly efficacious and cost-effective interventions by policy makers, researchers, and program managers,³⁴ have been the foundation

for an increase in nutrition on global and national agendas.³⁵⁻³⁹ These communities also coalesced in the creation of Scaling Up Nutrition (SUN) promoting a multisectoral approach involving delivery of direct interventions and policy reforms in key sectors (e.g., health, agriculture and education), which aligns inputs from government, donors, NGOs and others, consistent with the evidence synthesized in a recent Lancet series.⁴⁰ However, a recent evaluation of SUN reported that implementation at country level faces many challenges, including an “implementation disconnect”.⁴¹ Actors and institutions at national and sub-national levels function as a complex adaptive system, but their implementation logic is based on bureaucratic-rational assumptions which ignores this complexity. Consequently, the various actors still have divergent mandates, incentives and accountabilities, the nascent, formal coordination structures lack the authority and capacity to coordinate, and the globally-prescribed monitoring and evaluation systems lack the contextually-relevant, nuanced and timely information needed during the system-building phase as implementation challenges are surfacing.

Recognizing this disconnect, an implementation research effort was undertaken in four SUN countries to provide real-time and customized information to country stakeholders to better understand implementation challenges based on key principle of strengthening strategic capacity, learning and adapting management, and sharing documented learning. The research identified three critical investments necessary to build and sustain effective MSN systems: 1) strengthening human resources in the MSN coordinating unit; (2) creating an implementation team to cascade learning and implementation throughout the country; and 3) ensuring that accurate information on critical bottlenecks is conveyed and acted upon swiftly by high level decision makers across the sectors.⁴²

Implementation research to improve health management and service delivery

District Health Systems Strengthening. A growing body of implementation research demonstrates the use of participatory research processes to support learning and district health systems strengthening. In the cases described below, the participatory action learning strategies have been assessed using a range of qualitative, participatory and quantitative methods, and have shown promising results, identifying the likely pathways of effect.

The PERFORM (Improving Health Workforce Performance) project has involved partnerships between researchers and District Health Management Teams (DHMTs) in decentralised contexts (Ghana, Tanzania and Uganda). Working in three districts in each country, a management strengthening intervention was implemented to identify workforce performance challenges and feasible “bundles of interventions” to address them.⁴³ The project uses a systems approach where people involved in the health system use data to identify and address workforce problems, within the context of other health systems components that are also constraining the DHMTs. Examples of bundles of interventions include linking human resources strategies (e.g. attendance monitoring and appraisal) with strategies addressing wider health systems problems, such as by building competence and ensuring medical supplies are available.⁴³ This management strengthening intervention is being scaled-up across these three African countries, with implementation research guiding this process. The Expandnet approach to scale-up^{44,45} is being used, which focuses on key principles: systems thinking – the interrelationships between the different stakeholders and the wider environment; sustainability - institutionalising the intervention into policies, guidelines and budgets; enhancing scalability through ongoing monitoring so that implementers are able to adapt the intervention and learn and improve scalability; and respect for human rights, equity and gender.

In the Ghana PERFORM sites, positive changes in service delivery and workforce performance indicators at district level include improvements in vaccination and drop-out rates and

improvements in quality of HIV clinic services. Research was used to build management capacity in problem analysis and inform the design of integrated strategies for improving workforce performance and health systems. This resulted in strengthened supportive supervision, more regular feedback meetings, and improved documentation at the district and sub-district levels.⁴⁷ There has also been an increase in initiative and risk-taking culture, teamwork and collaboration and empowerment.⁴³

In Nepal an implementation research project used similar participatory processes as PERFORM to enhance health worker performance in three different districts and assessed the processes, effectiveness and feasibility to scale up.⁴⁶ The key components of the intervention included orientating health workers and health facility operation and management committee to the performance management package, setting benchmarks for key service delivery indicators at facility level, group monitoring and assessment for staff, individual appraisal, supportive supervision and feedback, development of outcome focused job aids for health workers, and community assessment. The findings showed improved functionality of health service delivery with increased motivation level of health workers, which contributed to a reduction of health workers' absenteeism in a number of health facilities. Group monitoring and supportive supervision was considered one of the components that helped improve health workers' performance. This was linked to improvements in the quality of health services and has potentially contributed to improved health outcomes especially in maternal and child health.⁴⁸

The District Innovation and Action Learning for Health Systems Development (DIAHLS) project in Mitchell Plain, South Africa, aims to strengthen leadership and governance within the district health system to support primary health care improvement and strengthen policy implementation. The approach has involved intervening in the routine processes of decision-making – the governance 'glue' of health systems.⁴⁹ Here, the learning is *negotiated & constructed* among

practitioners and researchers⁵⁰ to co-produce knowledge about how complex systems function and can be strengthened, and to support further action. The DIAHLS approach has included cycles of action learning working with providers at different levels and including relationship building, mentoring and coaching, reflection and writing, and implemented at both individual and team levels.

In Mitchell Plain Sub-district there have been impressive gains. For example, antenatal clients booked before 20 weeks gestational age improved from 114 clients booked in 2011 to 1452 clients in 2014. The HIV positivity rates in infants have been significantly reduced (PMTCT positivity rate declined from 1.8% (28 clients positive in cohort of 1570 PMTCT clients) in 2011 to 0.6% (9 clients positive in a cohort of 1564 PMTCT clients).⁵¹ Local system actors agree that the gains in managerial confidence, new managerial styles, positive attitudes and greater pro-activeness in identifying and tackling service challenges, at both facility and mid-level managerial levels, together with improved relationships across system levels and structures, has sustained and enhanced performance.^{49,52} There have also been spin offs – taking new ways of managing into new arenas, leading, for example, to innovative work addressing gender issues in a range of sectors that won local awards.

The learning from these different projects show that implementation research used for district strengthening can inform action and produce better results even in remote and challenging district contexts, with no additional financial resources. The impact on improved performance in delivering services is fostered where there is continuity and commitment of leadership, where there is a systems approach that identifies and addresses unintended consequences, engages key stakeholders and functions across the health system to catalyse wider change. Ultimately building trusting partnerships between researchers, health workers, managers and policy makers that facilitate the co-production of knowledge and action is critical. Trusting relationships with key

stakeholders (including the Ministry of Health) in Nepal, ensured collaborative dialogue when the 2014 earthquake caused significant damage to one of the implementation research districts (Rasuwa). It was agreed that the originally planned management interventions could no longer be implemented in Rasuwa, but that the team should undertake quick qualitative assessments to describe changes in service delivery and working environments after the earthquake and develop recommendations for policy makers to reinforce coping strategies and supportive systems. The findings highlighted the resilience of health workers in providing services, the need for additional psycho-social support, compassionate leave and recognition.⁵³

Respectful Maternity Care. Disrespect, abuse, and neglect of women is a barrier to facility-based birth as well as a violation of the human rights of pregnant and post-partum women.⁵⁴ In Kenya and Tanzania, research studies have documented the prevalence of and factors associated with abuse.⁵⁵ Research in Kenya involved a multi-level intervention initiated by a partnership of researchers, Ministry of Health officials, and other implementation agencies with multiple components, including draft legislation and guidelines and training for facility-based supportive counselling for health providers.⁵⁶ Through close work with stakeholders, packages of interventions were developed and tested to reduce abuse. The study documented a reduction in overall disrespect and abuse from 20% to 13%, despite the introduction of a national policy of free maternity care (presumably leading to higher utilisation) and nurses' strikes.⁵⁷ Based upon these results, the government of Kenya is beginning a national scale up the strategy. Stimulated by the early findings of this and a companion study in Tanzania, WHO commissioned a review and released a policy statement²⁴ and has embarked on a multi-country study to measure global prevalence. Concurrent to these efforts as well as these initial implementation research studies the White Ribbon Alliance has engaged in policy dialogue at country and global level, bringing this topic into the global and country level dialogues as well as stimulating further research efforts.

Integrated Community Case Management. From 2008 – 2013 in the African region there has been strong investment across 36 countries to assess the impact of Integrated Community Case Management (iCCM), a delivery system using community health workers (CHWs) to deliver treatment for pneumonia, malaria and diarrhea to children closer to communities. The findings of these studies, led by a variety of implementers were mixed, often showing no mortality impact.⁵⁸ Implementation research grounded in local contexts was needed to better understand different practices and outcomes in different contexts, and provide overall learning on how to best to adapt the implementation iCCM. Following in-depth consultation, recommendations were developed to focus research on a range of implementation issues^{59,60} including those highlighted in Table 4.

Table 4: Examples of Implementation Research in iCCM against pre-defined priority areas from 2008-2016.

	Training and Supervision	Supplies	Quality of Services	Deployment	Utilization
Cross-cutting findings	Training and supervision schedule, length and approaches varied, there is some evidence that consistent on site supervision improves quality of CHW performance.	Well supported, often parallel, systems ensure limited stockouts but when this is not the case stockouts are common	CHWs and drug shop attendees are capable of providing high quality diagnosis, treatment and referrals but only when well supported (i.e. trained, supervised and provided supplies and job aids).	CHWs may not be being deployed where most needed (e.g. close to public health facilities or private providers)	Generally these services have been underutilized and there may be preference for traditional, private or health facilities over iCCM but social mobilization can increase demand
Example of context specific findings	Supportive supervision (clinical mentoring) visits were effective in improving the consistency of iCCM skills in Health Extension workers in Ethiopia.	A mobile health (mHealth) technology – cStock, for reporting on community stock data in Malawi was feasible and acceptable and resulted in lower stockouts	In Zambia, CHWs providing iCCM appropriately classified malaria and/or pneumonia 94-100% of the time and provided correct treatment in 94-100% of episodes seen.	In Sudan mapping using GPS showed that over three-quarters of CHWs were deployed within a five kilometer radius of a health facility or another CHW, contrary to program planning and design.	In Niger and Mozambique demand increased for iCCM services, following the implementation of comprehensive social mobilization efforts.
Implications	Additional research is needed on the optimal training and supervision approaches and better integration into	Improve logistics of supply chain for overall health system including community distribution	Most well supported programs were implemented by NGOs, sustaining support by MOHs in struggling health care systems is unlikely unless it is correlated with overall	Increased research with geospatial analysis of CHWs and health facilities is needed	Increase research on understanding uptake of health care services and increase social mobilization and demand generation

	Training and Supervision	Supplies	Quality of Services	Deployment	Utilization
	existing health supervision and training systems		improvements in the health care system.		and test their impact.
References	49,50,61	52,54,57-60,62-64	49,54,56-60,62,63,65	49,66,67	68-71

* This is based on a review of the gray literature, reports from implementers on training and supervision.

During this time period there have been large increases in supportive policies for iCCM and increased implementation in the Africa region.⁶⁰ Delineating the specific impact of these implementation research studies on iCCM implementation in Africa is difficult, as iCCM policy development and implementation is influenced by the prevailing conditions of the health system in each country, their history of primary health care, the role of community health workers, and available funding and local champions and leaders.^{62,65} However, there is evidence from studies in three countries that policymakers greatly valued local implementation research and international research evidence was used to identify locally relevant policy options.⁶⁴ In addition, WHO and UNICEF functioned as knowledge brokers, bringing these implementation research findings from other countries through academic publications, statements, guidance documents, and meetings to the attention of local policymakers.⁶³

Implementation research to empower communities and beneficiaries

People at risk for HIV and discrimination. The government of India developed the National AIDS Control Program (NACP), which involves the implementation of targeted interventions (TIs) to reduce HIV for key populations, including female sex workers (FSW). A qualitative process evaluation was undertaken in two states: Andhra Pradesh and Karnataka, to assess the ways in which TIs are appropriately adapted to FSWs needs and the changing contextual and programmatic factors.⁷² Establishing outreach activities for FSWs, many of whom were illiterate, was challenging as they are stigmatized, face extreme discrimination – including a history of violence at the hands of police and family members – and were not organized into support groups or associations. The outreach strategy required several refinements, including the hiring of peer educators of different ages, the creation of the drop-in centers, the introduction of pictorial materials, and the design and re-design of interventions acceptable to them. Similarly, the condom promotion and distribution strategy and clinical service delivery models evolved. Several

models were implemented, adapted, and ultimately differentiated according to the needs of the clients. The most important component of the TIs was the gradual inclusion and integration of FSWs in the provision of services that were more responsive to their needs. The TIs started with needs assessments to a better understand the community of FSWs, revealing how addressing threats of violence and harassment are more important than HIV prevention. The regular involvement of the peer educators facilitated community-led interventions, eliciting interest in forming community-based organizations and generating greater community participation. This contributed to a social movement recognizing the rights of sex workers and their social entitlements.

The TIs benefited from a broad variety of implementation research, using multiple data sources inform implementation changes. The program used three major sources of data: periodic surveys and assessments; annual sentinel surveillance; and routine program data. The results were regularly triangulated to ensure their validity before decision-making and strategy refinement. A key lesson, however, is for managers to recognize that data will always have limitations, and they and that they needed to make “decisions based on the best available data rather than wait for the next sample or a more refined analysis”.⁶⁶ Using a quasi-experimental design that varied the level of intervention intensity, statistically significant declines in HIV prevalence among young pregnant women was observed between 2007 and 2011 in the districts with the highest intensity of targeted interventions without similar changes in lower intensity districts, suggesting they played a role in bringing about the decline.⁶⁷

Community directed treatment for onchocerciasis. Community directed treatment with Ivermectin (CDTI) is a core activity in the control of onchocerciasis in Africa. The strategy relies on active community participation in the process of ivermectin delivery: the community decides how, when and by whom the ivermectin should be delivered.^{73,74} Several studies have

demonstrated that Ivermectin alone cannot eliminate onchocerciasis, as it is active only on microfilariae, and its use is contraindicated in areas where *Loa loa* is highly endemic because individuals with high microfilarial loads of *L. loa* are at risk of serious adverse events.^{68,75,76} Recently, antibiotics targeting endosymbiotic bacteria (*Wolbachia*) of *Onchocerca volvulus* have been demonstrated to be a promising alternative tool for onchocerciasis control and elimination, particularly in areas of co-endemicity with loiasis, and has the added benefit of also killing adult worms.^{69,77} The implementation research process aimed to test the feasibility of a long course of antibiotic treatment (6 weeks). In the intervention arm of the clinical trial a rigorous process of community engagement was undertaken. First the team met with the community leaders to explain the process. Communities were then supported to select their own representatives who serve as community drug distributors (CDD). The CDDs were trained through an ongoing practical adult learning approach on the importance of adherence through the process of directly observed treatment. They were also supported in record keeping and strategies to ensure consistent supply of drugs through a process of health systems strengthening.

In a CDTI study in Cameroon, the intervention arm demonstrated very strong adherence rates (98%), showing that it is feasible and acceptable to deliver a complex intervention over a sustained period at the community level. Health impact assessments were conducted four years later that demonstrated a 10% reduction in prevalence of the disease and a significant reduction in the number of parasites in people's skin, while qualitative assessments at community level revealed a strong sense of enhanced wellbeing. The awareness of onchocerciasis and its socio-economic impacts on the population was a motivating factor for community adherence to treatment. As a result of the research, there has been policy changes in the programmes that have been adopted across Africa. Doxycycline is now used as an alternative to ivermectin in the control of onchocerciasis in areas highly endemic for *L. loa*.

Limitations of implementation research – a matter of balance

As with any research endeavor, there are questions about the quality of research that are applicable to the methods chosen, which are every bit as relevant to those used in implementation research. But the trade-offs between the pursuit of rigorous methodology and the timeliness and utility of the research is a major consideration in implementation research. As a simple example, policy-makers often do not require a level of confidence of $p < 0.05$ to make a decision, and may balk at expanding a sample size or the duration of a study simply to be able to do so. Another trade-off affecting implementation research is whether to identify and conduct research through processes embedded in a health organization being studied as engaged partners and actors in the policy and program process actors, or to work externally, where it is more possible to speak “truth to power” and provide a more objective view.

Another issue is that implementation research is often focused on answering a particular problem in a particular setting, limiting the generalizability or ability to learn in places other than where the study was conducted. Being explicit about the application of theory⁷⁸ and using recently developed StaRI reporting guidelines on implementation research should help to improve this.¹⁸

Another common tension is between the need to study and maintain the fidelity (implementation according to its design) of a particular intervention compared to the need to be able to adapt the intervention and learn lessons in the course of implementation. Adaptations to the intervention often happen as it is being scaled up or as conditions change. Implementation research can provide valuable information to guide these adaptations so that they “fit” the different contexts and needs, demonstrating the importance of implementation research from the outset of the scale up of complex interventions. There is increasing recognition of the need to not only test the effectiveness of standardized interventions, but to use implementation research to support the evolution of interventions to fit the organizational and ecological contexts within which they are

used. This approach recognizes that such adaptation can improve the outcomes of an intervention, rather than lead to an inevitable ‘voltage drop’ in effectiveness.⁷⁹ Both approaches can be appropriate, but it is important that key stakeholders (e.g. researchers, authorizing and implementing agencies) are in agreement at the outset, or at least on how long they want to pursue a particular approach. One way of dealing with this in pragmatic trials is to have a design phase where the feasibility of different implementation arrangements or components are tested and agreed, and then fixed for the duration of the trial.⁸⁰

Other tensions arise when balancing stakeholder interests and incentives within implementation research. Researchers need to spend time getting to know policy and practice organizations, as well as give up some level of control over their research. This requires skills and time that they may not have, in part due to the challenges of costing such time and meeting deadlines in conventional research funding proposals. Ceding control in this way requires a greater tolerance for uncertainty, but the payoff is frequently better engagement, a more immediate impact of the research and sustained engagement. However, if universities do not value research impact in their recognition and promotion criteria, this may be a risky endeavor, especially for junior academics. For implementing agencies and policy-makers, implementation research provides opportunities to improve their programs and services, but may also shine a light on their work, with real consequences if performance is poor. Despite these organizational tensions, improvements in accountability are likely to benefit patients and populations served by health systems.

Conclusion

The case studies demonstrate the wide range of implementation research processes in terms of scale, topic, methods and range of impacts in global health. The impacts from implementation research do not always fit neatly into the categories we have used to describe them. The same research can affect health outcomes while also informing policy, improve health management and service delivery, and/or empower communities and beneficiaries. Many of the case studies illustrate how implementation research can be used to improve health service delivery within specific contexts, and discuss the processes that can inform scale up and efforts in other settings. Some of the case studies focus on vertical or disease specific interventions (e.g. smallpox, HIV, or onchocerciasis), and others on broader health systems strengthening (e.g. Afghanistan balanced scorecard and the district level cases). In the case of disease specific interventions, it is the implementation focus that brings in the need to acknowledge and address the broader health systems factors that can either enable or inhibit effective action, and raises other areas for critical consideration, such as community ownership and adaptation to community needs.

Context is critical to the implementation research endeavour, and the case studies make context explicit. Many of the case studies include implementation research processes across different county contexts and programmatic objectives. There are strategic opportunities to learn lessons across diverse contexts. The case study examples of national nutrition systems, iCCM, and strengthening health systems at district level illustrate a cumulative and growing body of knowledge about developing the health system's organisational capacity across multiple contexts and issues. Implementation research allows one to document processes to ensure that the depth and detail of what has been done is made explicit, so that adaptation to other contexts can be considered. Earlier work in this area has emphasized the importance of context and local and ongoing adaptation. For example, a systematic review of 150 strategies to strengthen health services in LMICs highlighted significantly higher implementation outcomes when there was

flexibility and modification through stakeholder feedback, constraints reduction plans, initial and continuous adaptation of the strategy to the local context, broad-based support of stakeholders, and coordination and community organization.⁷⁰

Implementation research is about the “how to” of implementation - testing feasibility, adoption, and acceptance; and addressing quality, equity, efficiency, scale, sustainability and ensuring coverage to all, even the marginalised, with the ultimate goal of strengthening health systems to improve health outcomes. These endeavours involve a range of research methods, shaped according to the questions addressed and further iterative processes linking research, reflection and action. These processes play important roles in helping policy change to be realised, sustained, and have an impact.

The case studies also demonstrate how implementation research involves partnerships across the research and implementation cycles with co-production and concurrent use of knowledge. Dissemination alone is not sufficient to support real change. The core characteristics of implementation research, as shown in Table 2, include the nurturing of trusting partnerships to conduct real world, real-time research that addresses relevant implementation challenges. The case studies illustrate the importance of context and how health systems operate as complex adaptive systems⁷¹ and are constantly changing and shaped by the activities of a diverse set of actors who have different types of incentives to engage or not in implementation research. They illustrate approaches to complex issues in health systems strengthening, and how different stakeholders can learn from the work. Local leadership to support ownership, flexibility and responsiveness of research to the realities and challenges posed by changing, complex and adaptive health systems is important. Fragility and disaster bring into sharp focus the importance of trusting relationships and approaches that are both embedded and iterative in order to address the needs and realities of changing contexts.

The implementation research and delivery science statement released at the Cape Town Global Symposium on Health Systems Research is a call to action to the Global Health Community (including academia, implementers, national and global health institutions and donors) to take up the challenge of strengthening implementation through productive partnerships between policy makers, implementers and researchers.⁵ Advancing implementation research will require overcoming some challenges including the misalignment of incentives in some academic institutions which discourages young academics from creating a career in this area and sharing experiences through networks and publications. The growing effort to produce guidelines for publishing implementation research reveals the limitation of current approaches and recognizes the importance of reporting studies in sufficient detail to permit replication or adaptation.⁶⁷ This highlights the need for further dialogue between journals and authors on how to report the implementation process and learning from implementation research and the broader field of Health Policy and Systems research. Implementation research, as outlined in this paper, presents an opportunity to bridge the knowing-doing gap for the ultimate shared health impact that we researchers, policy-makers, program implementers, and communities seek to achieve.

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