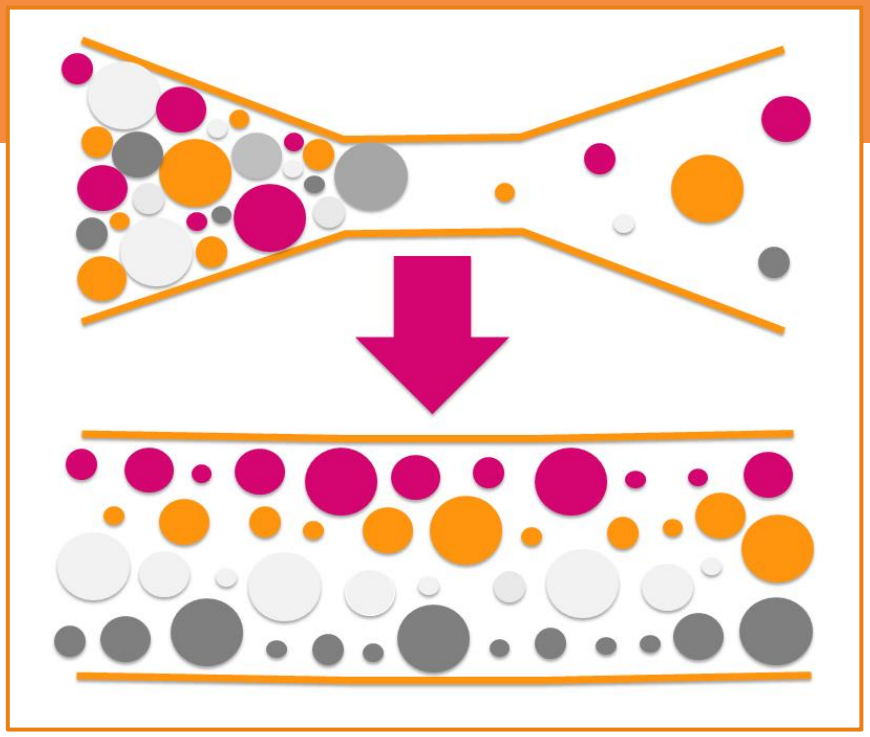
The Implementation Science System Guide

From Bottlenecks to Impact

January 2022



THE SOCIETY
FOR IMPLEMENTATION
SCIENCE IN NUTRITION

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LIST OF ACRONYMS AND ABBREVIATIONS

3ie	International Initiative for Impact Evaluation
AAR	After Action Review
ANC	Antenatal Care
BAR	Before Action Review
BNA	Bottleneck Assessment
BMGF	Bill & Melinda Gates Foundation
BSI	Bottleneck and Solution Inventory
CIR	Contextual Implementation Research
CKE	Contextual Knowledge and Experience
FES	Focused Ethnographic Study
GKE	Global Knowledge and Experience
IFAS	Iron and Folic Acid Supplementation
IR	Implementation Research
IRB	Institutional Review Board
IS	Implementation Science
ISI	Implementation Science Initiative
ISN	Implementation Science in Nutrition
ISS	Implementation Science System
KB	Knowledge Brokering
PAG	Program Assessment Guide
PI	Principal Investigator
PIP	Program Impact Pathway
SISN	Society for Implementation Science in Nutrition

ABOUT THE GUIDE

Implementation science (IS) is a systematic approach to address implementation bottlenecks in order to strengthen programmatic coverage, quality and impact.

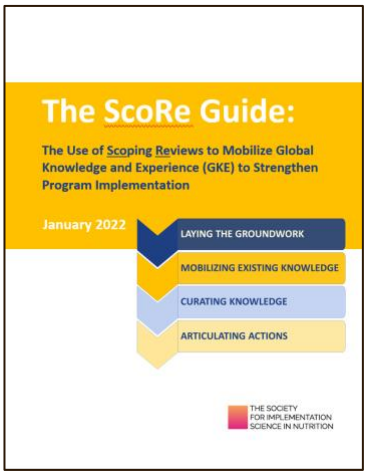
The **Society for Implementation Science in Nutrition** (SISN) was formed in 2016 to promote and support the application of implementation science in nutrition (ISN). In 2018, SISN partnered with the International Initiative for Impact Evaluation (3ie) and teams in Kenya and Uganda to operationalize its integrative ISN framework[1] and gain experience in building national capacity for IS. This collaboration led to the development of an operational model for an **Implementation Science System (ISS)** to assist implementers and decision-makers in other settings to apply ISN in their programs.

The **ISS Guide** presented here provides guidance on how to apply implementation science in nutrition (ISN) using the operational model for ISS. It also provides guidance on knowledge brokering, which is also an essential feature of an ISS. The guide is intended for implementers who wish to use IS to improve the implementation and impact of their programs. The ISS Guide was developed based on experience gained from the implementation science initiative (ISI) that took place in 2018-2020 in Kenya and Uganda. ISI was a learning initiative in which IS was centered as a way to improve the implementation of iron and folic acid supplementation (IFAS) programs in the two countries. It was the first attempt to operationalize the ISN framework.

In this ISS Guide, the various steps of the ISS Operational Model are presented along with specific guidance notes that refer to the different parts of the approach and facilitate its application. A few examples and learnings from Kenya and Uganda are inserted throughout the ISS guide to illustrate specific aspects or challenges of the work. Additional details concerning the integrated ISN framework are available in a companion journal article in Current Developments in Nutrition[2].

This guide is part of a living toolkit

The ISS Operational Model described in this guide was developed over a 3-year period in the two participating countries. It draws upon existing knowledge about IS from the literature, experience gained during ISI, validation with country actors and a theory-based developmental evaluation embedded within ISI. This guide is part of a living toolkit that is intended to evolve and be strengthened with additional experiences, tacit knowledge, and views as other researchers and practitioners apply the ISS Operational Model to other programs and contexts. The present guide comes with two companion guides to assist in the planning and implementation of a bottleneck assessment workshop (Program Assessment Guide) and a literature review (ScoRe Guide).



This ISS Guide contains five parts that are presented in detail in the color-coded sections that follow:

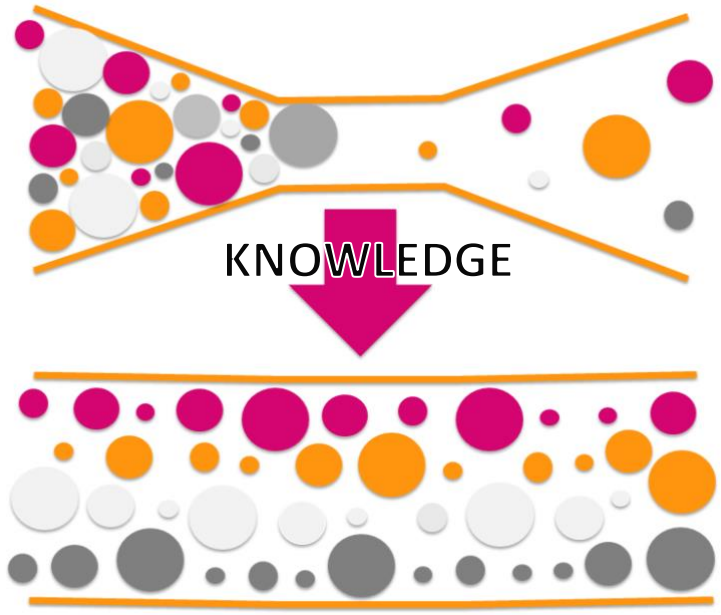
	1) Bottleneck Assessment
	2) Bottleneck and Solution Inventory
	3) Literature Review
	4) Implementation Research
	5) Knowledge Brokering

Box 1: Implementation bottlenecks

When taking a systems perspective, a **bottleneck** is a constraint in the flow of operations (upper panel) or activities that prevent or impair a program from achieving its outcomes.

We cannot fix bottleneck until we find it. Once we find it, using various forms of **knowledge** can help us address it.

Finding a bottleneck is an opportunity to **improve the implementation** and the system (lower panel).



Please note in the following sections:

- we refer to projects, programs and platforms simply as programs.
- we also use the term IS initiative to designate any effort in-country that seeks to apply an ISS Operational Model to improve program implementation.
- we use ISI to refer specifically to the initiative in Kenya and Uganda.

INTRODUCTION

Implementation challenge

There is an unprecedented commitment to nutrition and the implementation of policies and efficacious interventions to reach national and global targets. However, large gaps exist between those targets and actual achievements due to implementation bottlenecks that compromise coverage, quality and impact at-scale. Implementation Science (IS) is of great value to address the implementation challenge; it is a systematic approach that can help address and remove implementation bottlenecks in order re-establish the flow of operations (Box 1). It facilitates going from bottlenecks to impact. The IS in Nutrition (ISN) framework emphasizes there are three forms of knowledge that can assist in that process: Contextual Knowledge and Experience (CKE), Global Knowledge and Experience (GKE) and Contextual Implementation Research (CIR). The work in Kenya and Uganda revealed the importance of taking a systems approach to mobilizing knowledge from these sources (Box 2).

Box 2: The Implementation Science Initiative (ISI) in Kenya and Uganda

ISI was carried out in Uganda and Kenya, as part of the collaboration between SISN and the International Initiative for Impact Evaluation (3ie), thanks to a grant from BMGF.

The goal of ISI was to strengthen IFAS programs during implementation through applying guiding principles. To lead the process in country, an implementing agency was selected. A core team was created, including policymakers, researchers and implementers.

Operational Model for an IS System (ISS)

Applying ISN can be achieved through an operational model for ISS, illustrated in Figure 1, and further explained in Table 1 (next page). Knowledge brokers (KB) play a vital role in linking knowledge to action[3], as depicted in the figure.

Applying the ISS Operational Model requires to carefully consider which of the three forms of knowledge is needed, in a given situation, mindful that they differ in terms of timeliness, practicality and the resources and capacities required. This is highlighted in the following guiding principles developed during ISI:

1) Mobilize existing knowledge, frameworks and tools to address some of the bottlenecks whenever possible (drawing from GKE and CKE)
2) When research (CIR) is needed, use methods with the level of rigor, practicality and timeliness appropriate to the decision context
3) Collaboratively identify implementation research (IR) topics based on priority implementation challenges and bottlenecks
4) Facilitate formal and informal interaction, knowledge exchange and collaboration between researchers and program/policy actors in an ongoing manner (through knowledge brokering) in order to foster common understandings, effective working relationships and appropriate interpretation and application of IS/IR findings.

Figure 1: Operational Model for an Implementation Science System (ISS)

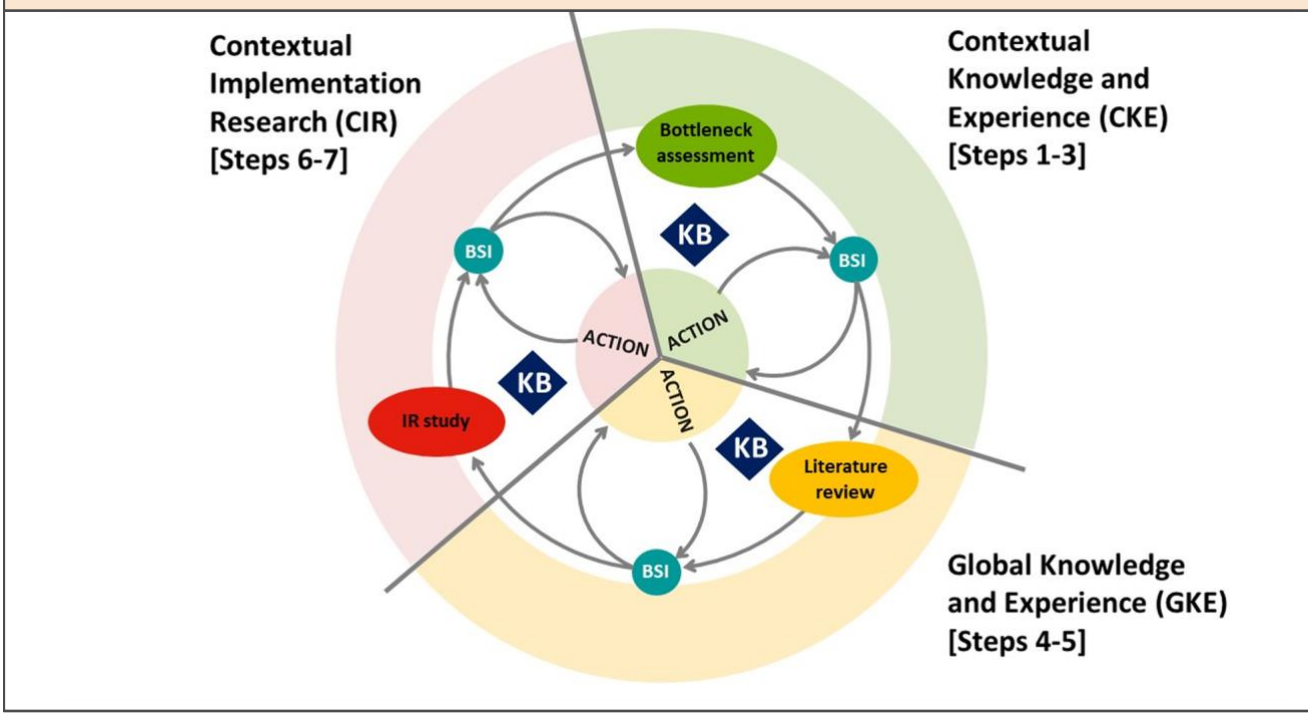


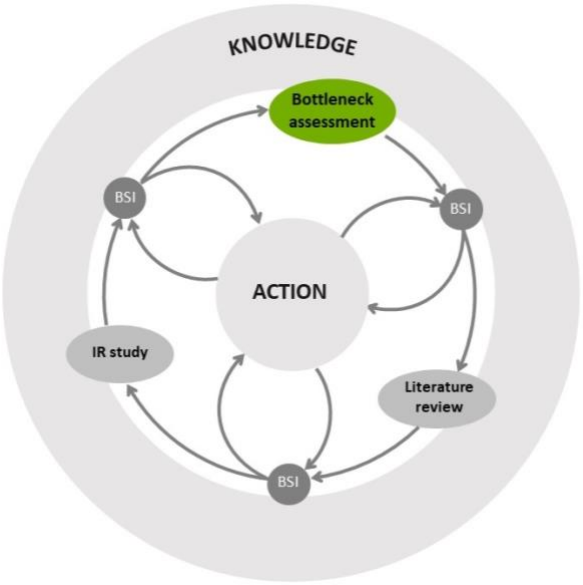
Table 1: Steps of the ISS operational model and their associated guidance notes

Step	Description	Associated guidance note
1. **Bottleneck assessment (BNA)**	- Assessment done in a program to identify bottlenecks at various levels in the systems and potential solutions - Prioritization done at the end of the BNA to reach agreement on next steps	- BNA
2. **Bottleneck and solution inventory (BSI)**	- Living document updated over time that gathers all the bottlenecks identified, related factors, potential solutions, actions carried out and next steps to be taken	- BSI (BAR and Action exercise parts)
3. **Action and BSI**	- Actions that can already be carried out - Documentation of efforts to apply the solutions, including additional complications or bottlenecks encountered	- BSI (AAR exercise part)
4. **Literature review and BSI**	- Search, examination and curation of existing knowledge to start taking action on the bottlenecks identified and prioritized - Filling in of the BSI with this knowledge	- Literature review - BSI (BAR and Action exercise parts)
5. **Action and BSI**	- Actions that can already be carried out - Documentation of efforts to apply the solutions, including additional complications or bottlenecks encountered	- BSI (AAR exercise part)
6. **Implementation Research (IR) study and BSI**	- Undertaking of IR studies to fill gaps of knowledge	- IR - BSI (BAR and Action exercise parts)

	- Filling in of the BSI with this new knowledge generated	
7. Action and BSI	- Actions that can already be carried out - Documentation of efforts to apply the solutions, including additional complications or bottlenecks encountered	- BSI (AAR exercise part)

BOTTLENECK ASSESSMENT

OBJECTIVES
➢ Understand what a bottleneck assessment (BNA) is, and its utility ➢ Understand how to do a BNA through a workshop



What is a Bottleneck Assessment (BNA)?

A Bottleneck Assessment allows key stakeholders to identify current challenges, also known as bottlenecks, and to begin to discuss prioritization and strategies to address them. When the ISS Operational Model is applied for the first time, the main objective of the initial BNA is to provide the foundation for developing a Bottleneck and Solution Inventory (BSI).

How to do a BNA?

There is no standard approach to conducting a BNA; choose the type of approach that is most effective for identifying bottlenecks. Examples of approaches include highly structured surveys linked to administrative data at different levels of a delivery system[4,5], rapid assessments within a smaller number of units within the system[6], key informant interviews and participatory workshops[7]. Workshops are particularly insightful because this type of approach:

a) is systematic and participatory

b) involves diverse stakeholders.

While it is not the unique approach, a participatory workshop is attractive because it helps every stakeholder to hear the perspective of others and better understand the system as a whole and how the different parts connect to each other. It also allows for reaching a consensus on bottlenecks in the system, and which ones to prioritize for action.

Objectives of a BNA workshop

- Identify bottlenecks affecting the implementation of the program of interest
- Generate possible solutions to address bottlenecks
- Identify bottlenecks that could already be addressed quickly
- Prioritize the remaining bottlenecks
- Provide the information needed to create a Bottleneck and Solution Inventory (BSI)

Recommended Steps to do a BNA workshop

Planning Logistics

1. Choose a date and time for the venue
2. Develop a diverse list of stakeholders and send invitation letters

Planning Content

The preparation for the BNA can take place through a participatory approach

1. Organize a planning meeting that defines the objectives of the event
2. Identify approaches, instruments, and facilitators
3. Consider different tools that could be used to carry out a systematic analysis of bottlenecks within a system or to prioritize the bottlenecks, for example:
    a. Adapt the Program Assessment Guide (PAG)[8,9] to facilitate the meeting and map out the systems
    b. Create criteria for a ranking system exercise, to help prioritize bottlenecks during BNA (see Box 3)
4. Create a facilitator's guide and agenda for the event
5. Gather preliminary information about potential bottlenecks

Follow-Up

1. Prepare an evaluation form to gauge audience understanding
2. Create a report based on the BNA event
3. Organize meetings to complete the assessment process and validate, or elaborate, the bottlenecks identified
4. Disseminate the results.

Box 3. Prioritization of the bottlenecks

The **prioritization** of the bottlenecks can be done through an iterative process. To help prioritization, it is useful to think about the following aspects or criteria:

- the importance of addressing a bottleneck (e.g. 'stockout' is at the beginning of the results chain so it should have an impact on everything else, but perhaps 'stockout' is very rare);
- the existing windows of opportunity to begin addressing a bottleneck;
- the type of bottleneck and the actions required to address it (minor vs. major changes, etc.) and the feasibility of the solutions considered (funding, capacity, political will, etc.). For some of these bottlenecks, obvious and/or easily achievable solutions can be tried out more or less quickly. For others, a pilot study may be required to test a solution and this may require additional funding;
- the potential impact of possible solutions on the resolution of the bottleneck (direct vs. indirect), and the timing of the solutions (rapid vs. long-term);
- the expected sustainability of the potential solutions;
- the potential unintended consequences of the potential solutions.

Conclusion

The BNA allows for specific challenges and strategies to be identified, while including knowledge from a variety of stakeholders. Since BNAs are flexible in structure, they are widely applicable to different projects and can be implemented by various country teams.

Case study: BNA

In ISI, the country teams of Kenya and Uganda decided to carry out the BNA in the form of a two-day participatory workshop. Both country teams used the Program Assessment Guide (PAG) as the guiding approach. The implementing teams adapted the PAG to their needs and created a facilitator guide and an agenda for the workshop. In Uganda, 18 participants participated in the BNA workshop; in Kenya, it reached a total of 39 participants. In both countries, the facilitation of the workshop was shared among members of the core team: the project coordinators, researchers and some government representatives. In Uganda, a pairwise ranking of the bottlenecks and of potential solutions took place during the BNA workshop. This helped to prioritize three bottlenecks:

i) inadequate provision of IFAS-related health education to the mothers

ii) weak drug quantification process at health facility resulting in unnecessary stockouts

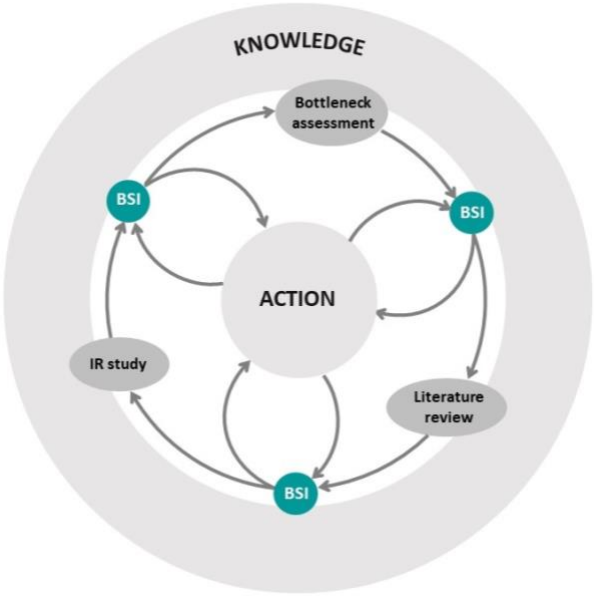
iii) low male involvement.

In the same country, the results of the workshop were presented during the monthly Nutrition technical working group meeting from the Ministry of Health.

BOTTLENECK AND SOLUTION INVENTORY

OBJECTIVES

- Understand what a bottleneck and solution inventory (BSI) is and its importance
- Understand how to create and populate a BSI



What is a bottleneck and solution inventory (BSI)?

The first activity to begin assessing the system is the BNA, through which bottlenecks at various levels are identified and prioritized. The bottlenecks and the work to address them need to be thoroughly monitored in a bottleneck and solution inventory (BSI), which takes a systems perspective and helps ensure that the bottlenecks at various levels are considered throughout the implementation period.

Objectives of a BSI

The BSI documents:

i) the bottlenecks that are preventing the program from achieving its objectives
ii) the factors that are creating those bottlenecks
iii) the efforts that have been made to address them
iv) the experiences and outcomes from those efforts, and
v) the next steps.

The BSI can be considered detailed progress tracking tool.

How to create and populate a BSI?

Before creating a BSI, you can reflect on the following questions to help you determine the best medium for the BSI:

- Who would have access to the BSI?
- Who would collect and update the information for the BSI?
- What would be the level of description for the bottlenecks that would be entered into the BSI?
- How would data be analyzed and used and who would use the BSI to address issues?

In this guidance note, an exercise is presented to help you understand how to fill in the BSI. While the main framework for the BSI can be derived from this exercise, there is flexibility to adapt to your context.

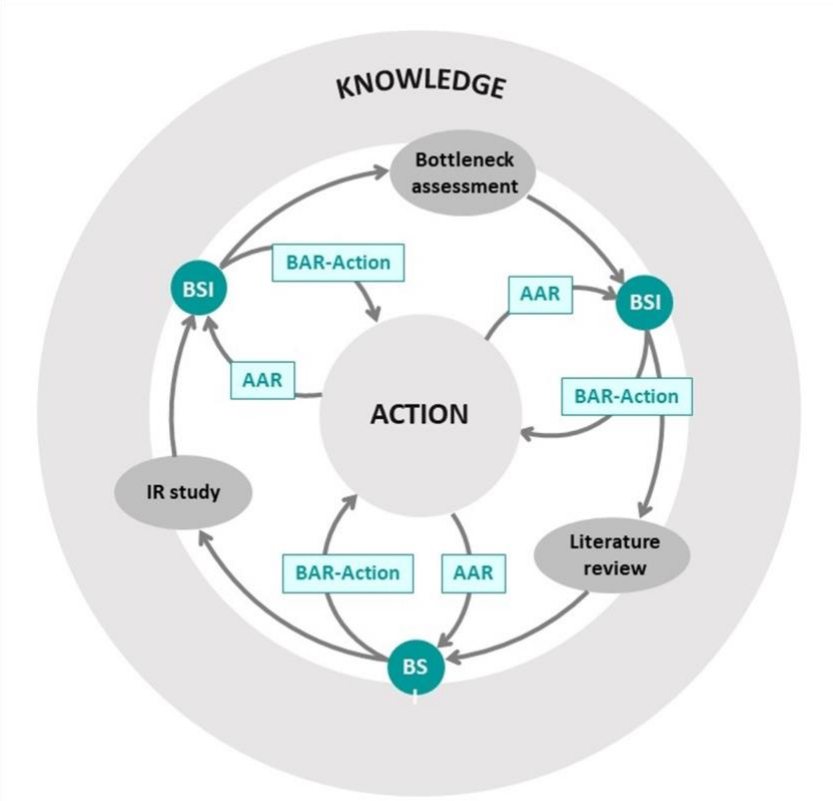
ABOUT THIS EXERCISE	THIS EXERCISE WILL HELP YOU
• Requires limited time to be used (about 30 minutes for each step) • Is simple • Is applicable to many situations and in many contexts	• Begin populating the bottleneck and solution inventory and articulating solutions that will then be tested • Document the process and actions to allow for deeper reflection • Turns activities and events into opportunities to test and refine thinking

This exercise is divided in three parts:

- **Before Action Review (BAR):** this part involves asking questions to better understand the bottlenecks and make underlying assumptions more explicit in order to test them.
- **Action:** this part involves designing the actions that will take place and carrying them out.
- **After Action Review (AAR):** this part involves reflecting after the actions have taken place in order to generate learnings and envision the way forward[10].

As depicted below (Figure 2), the first two parts of this exercise will be used before taking action. The third part will help you to fill in the BSI once you have tried to apply a solution.

Figure 2: How does the exercise help you to populate the BSI?



Conclusion

The creation and utilization of a BSI is essential to ensure that actions are taken and there is a mechanism by which we can learn from reflecting on challenges in the process and track progress.

Case study: BSI

As there was no previous experience with a BSI, it needed to be created from scratch. Initially, Uganda considered using an existing web platform, but this entailed several technological and conceptual challenges. Instead, a simpler and practical tool was developed based on Excel spreadsheets. Discussions about the BSI also raised concerns about the potential sensitivity of some documenting bottlenecks so explicitly and the negative perception or blame that could arise.

Indeed, bottlenecks are problems, barriers or constraints in the system and can be perceived negatively or as blaming when connected to the person responsible for addressing the bottleneck. To minimize sensitivities, it was suggested to refer to the tool as a “bottleneck and solution inventory” instead of as a "bottleneck inventory."

Before Action Review – BAR		
	QUESTIONS	**ANSWERS**
1	**What is the bottleneck?**	
2	**Why is it important to address this bottleneck? Why do we prioritize it?**	
3	**Who is engaged?**	
4	**Which levels of the program or system are engaged?**	
5	**Who should we contact to verify these assumptions?**	
6	**Goal - What is our intended result?**	
7	**What challenges might we encounter?**	
8	**What have we learned from similar situations?**	
9	**What will make us successful this time?**	
10	**When will we do the AAR?**	

What are the solutions proposed?

What needs to happen to do that? What products or activities do we need to develop?

Who will be responsible to create it? To advocate for it?

Where will we try it?

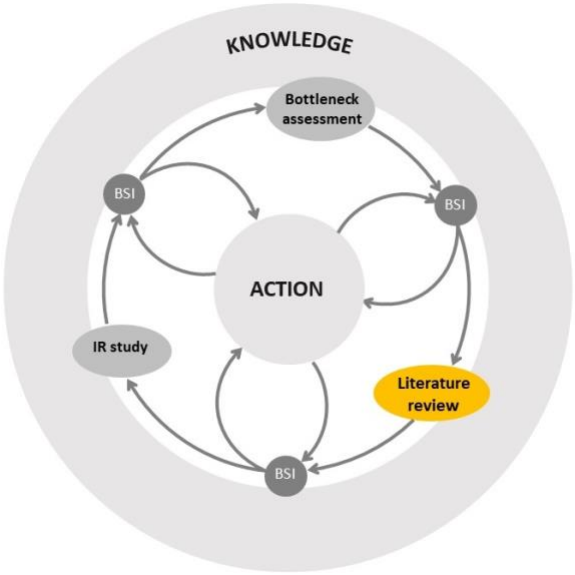
When? Are there windows of opportunity? What timelines are expected?

ACTION

After Action Review – AAR		
	QUESTIONS	**ANSWERS**
1	**Who is the most important to get feedback from?**	
2	**What are the results so far? Are we late?**	
3	**What are the reasons for these results?**	
4	**What are/were the challenges? Were those challenges expected?**	
5	**What have we learned? What will be sustained or improved?**	
6	**What were the enabling or inhibiting factors?**	
7	**Were there missed opportunities?**	
8	**When will we do the next BAR?**	

LITERATURE REVIEW

OBJECTIVES
➢ Understand the added value of a literature review as part of the ISS Operational Model
➢ Understand what type of knowledge is involved
➢ Understand how to do a literature review in the context of the ISS Operational Model

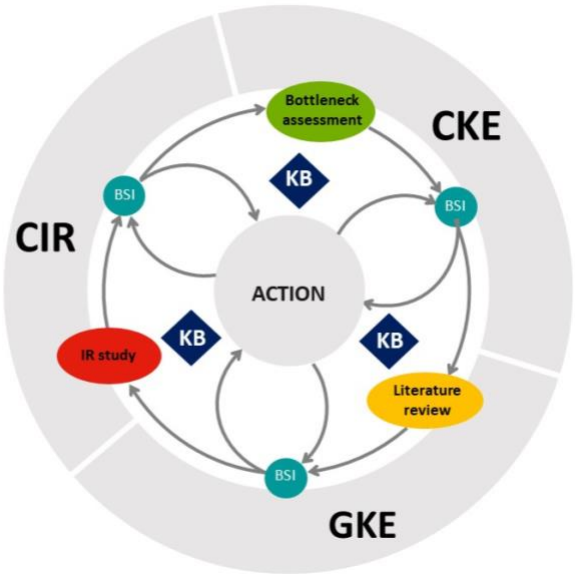


Why doing a literature review as part of the ISS Operational Model?

- The identification and prioritization of bottlenecks provides direction on areas that are in need of further examination.
- The integrated framework for ISN underlies that first existing knowledge needs to be used before undertaking new IR studies. This is not easily done as existing knowledge is not always readily accessible and usable, which explains a critical gap in knowledge utilization.
- This literature review allows you to tap into existing knowledge and make it usable in order to address the prioritized bottlenecks in a timely manner.
- The literature review will lead you to: 1) take immediate action, and/or 2) the development of IR studies that will later lead to action.

What knowledge to look for?

There is a wide range of decisions and processes involved in program implementation and diverse forms of knowledge need to inform them. Three forms of implementation knowledge are identified in SISN framework and can be used to inform practice:



1. ***Contextual Knowledge and Experience (CKE)*** refers to the often-tacit knowledge and experience of planners, implementers, and others who possess intimate knowledge of contextual features that can have profound implications on the performance and prospects for a policy, program, intervention, or innovation.
2. ***Global Knowledge and Experience (GKE)*** refers to knowledge that is often packaged into

frameworks, tools, and guidelines but is typically underutilized because it is widely dispersed, and planners and implementers typically do not have the time, means, or incentive to locate, adapt, and apply it. GKE also includes the often-tacit knowledge and experience of practitioners who have confronted similar implementation challenges in other settings and have often found practical solutions.

3. ***Contextual Implementation Research (CIR)*** refers to various forms of practical, timely, empirical inquiries and assessments in a specific country or programmatic context to identify or clarify the weaknesses, strengths, and bottlenecks in various domains and phases, and to adapt interventions to local contexts during the planning phase.

While the BNA provides a mechanism to tap into contextual and experience knowledge (CKE), the literature review helps to ensure that global knowledge and experience (GKE) are used to address implementation bottlenecks. It refers to published or unpublished findings, frameworks, tools and guidelines from IR in other countries and implementation experience in other countries.

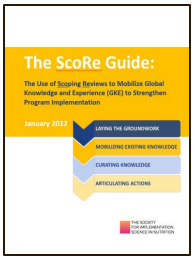
How to do a literature review in the context of an IS initiative?

There is a variety of types of reviews from which to choose when doing a literature review. However, undertaking a literature review in the context of ISN requires using a type of review that allows for limiting the scope and breadth to something manageable and to have results accessible to stakeholders in a timely manner. While comprehensive systematic reviews of the literature are not always possible or desirable, it is still possible to use systematic approaches that will be more cost-effective and lead to the gathering of meaningful insights.

Box 4: Potential literature review methods

- Integrative review
- Mixed methods review
- Introductory review
- Mapping review (or descriptive review)
- Narrative review
- Rapid review
- Realist review
- Scoping review

In the context of ISN, the process of undertaking a literature review is tied to the engagement of key actors in a change process to make sure that the knowledge retrieved can lead to specific actions—that the knowledge becomes actionable. This needs to happen in a timely manner so the literature review can inform the decision-making of implementers. The choice between literature review methods is driven by the purpose of the review as well as the time and resources available. It may also be necessary to adapt a chosen method to further fit the method to the particular context, purpose and resource constraints.



The Scoping review methodology appears particularly relevant and an adaptation of this type of review was used in Kenya and Uganda as part of the Implementation Science Initiative (ISI). The experience led to the development of a guide to assist users in adapting and applying a scoping review in the context of ISN: **The ScoRe Guide**. It proposes a staged approach to guide the search and review of scientific and grey literature to strengthen the utilization of existing knowledge in a timely manner.

In brief, to carry out this literature review, you will need:

- To create a team who can shape the objectives and desired products from a literature review, and make sense of the data;
- To undertake the literature search per se, adapting the search strategy to the time and resources available;
- To curate the knowledge to make it usable;
- To tie the findings to action by using the BSI and identifying appropriate programmatic changes based on the findings.

Conclusion

Within the ISS Operational Model, the literature review is an effort to see if existing global knowledge and experience might be adapted and used to address some of the bottlenecks. It also may help the design of IR studies to better understand certain bottlenecks or explore the feasibility of various solutions.

Case study: Literature review

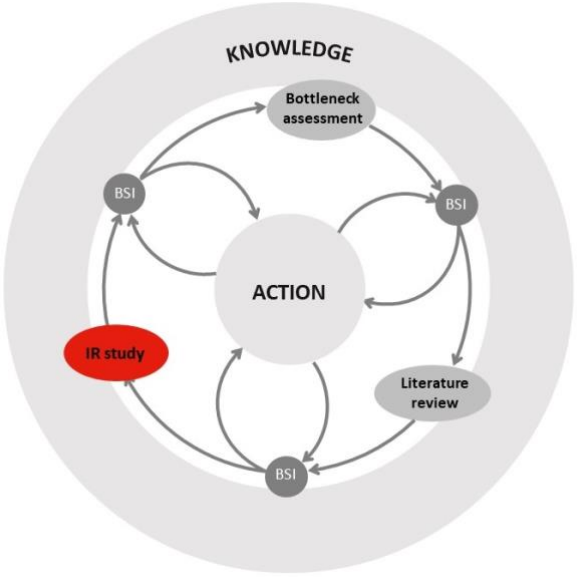
In ISI, at first, and because it was a learning initiative, the efforts of the country teams were particularly concentrated towards the undertaking of IR studies. It is not until the COVID-19 pandemic forced them to pause that the process of literature review could take place and that the countries fully understood its added value.

The Kenya and Uganda teams had decided to use the focused ethnographic study (FES) approach for one of their IR studies, to help them investigate the barriers to antenatal (ANC) attendance and the use of iron and folic acid supplementation (IFAS), including early disclosure of pregnancy, and male engagement. An FES facilitates the investigation of cultural and behavioral patterns from the perspective of users/community members. The first step in an FES is to develop an interview guide tailored to the topic at hand and a literature review can assist in that process. The work began with the creation of a group of researchers and implementers from various organizations. Three subgroups were formed to work on three specific bottleneck-related topics: ANC attendance and IFAS adherence; male involvement; and pregnancy disclosure. The team created a Program Impact Pathway (PIP) to help them classify the various factors that would be retrieved. The work continued with the search for literature and the coding of the papers. A conceptual framework was then developed to better understand how these factors relate to each other and the findings were summarized. This literature review allowed the two countries to create and/or adapt interview guides to the context of ANC attendance and IFAS adherence. Importantly, it also led to the development of recommendations for immediate actions and guided actions for the next steps.

IMPLEMENTATION RESEARCH

OBJECTIVES

- Understand the many purposes and methods of implementation research (IR)
- Understand the many phases and activities in planning and conducting IR
- Cautions regarding IR



Purpose of Implementation Research (IR)?

The purpose of IR is to generate knowledge and inform decisions related to the implementation of a policy, program or intervention. For instance, there may be a need to understand stakeholder perceptions, bottlenecks at community, clinic or household levels, or the feasibility and acceptability of certain solutions or to monitor, guide or evaluate various solutions.

Methods of IR

IR is an umbrella term for a wide range of methods, the choice of which depends upon the specific purpose, in a given situation. Common forms of IR are formative research, opinion leader research, stakeholder analysis, rapid assessment, operation research, process evaluation, analysis of national survey data or other large-scale surveys to assess coverage of services or interventions, among others. Some forms of research, such as randomized, controlled trials, cohort studies and impact evaluations would not be designed specifically as part of IR, but the data from such studies might well be useful in secondary analyses to answer specific implementation questions. For instance, data from an impact evaluation might be used to understand impact pathways, identify barriers or enablers for accessing services or assess factors related to service quality.

Phases and activities in IR

The planning and implementation of IR studies can be very resource intensive and, as such, should be undertaken only when there is a clear need (agreed-upon by implementers) that cannot be addressed in other ways. The precise tasks may vary depending on the purpose and methods chosen, but Table 2 provides a checklist to help in the process.

Table 2: Checklist for carrying out IR

PHASE AND ACTIVITIES	In process	Done
Development of the IR proposal		
Engage members of the core team representing different areas (researchers, policymakers and implementers) to become the research team - in a collaborative process		
Formulate the research questions in an iterative manner with the team		
Review selected literatures to explore the knowledge around the bottlenecks identified and prioritized		
Select the appropriate research design		
Plan capacity-building training on the methods for the research team, as needed		
Share research protocol with relevant actors and groups to gather comments		
IR submission and approval		
Select the ethics committee to submit the proposal, allowing for several months before beginning the study		
Submit research protocol to Institutional Review Board (IRB)		
Address comments and resubmit whenever needed		
Once approved, submit the research protocol to the national instance whenever needed		
Data collection preparation		
Determine where and with whom the data collection will take place (e.g. identification of specific health facilities or mapping of pregnant mothers, plan for recruitment)		
Training data collectors		
Pilot-test the data collection tools		
Consider booster training or mechanisms to ensure collecting quality data (e.g. role-playing exercise)		
Develop a data collection plan		
Data collection and analysis		
Plan for a baseline data collection, and additional time period as needed according to the research design		
Discuss data analysis with the research team early on		
Provide supervision and onsite mentorship of the research assistants to ensure quality data collection		
Oversee the data cleaning process		
After the first data collection phase, draw lessons to be applied to future data collection		
Produce a comprehensive report to present the analysis		
Dissemination of findings and implications		
Articulate practical implications of research findings		
Disseminate findings and implications to diverse audiences		
Package findings for relevant audiences to ensure findings are used		
Consider using different communication mediums		

Conclusion

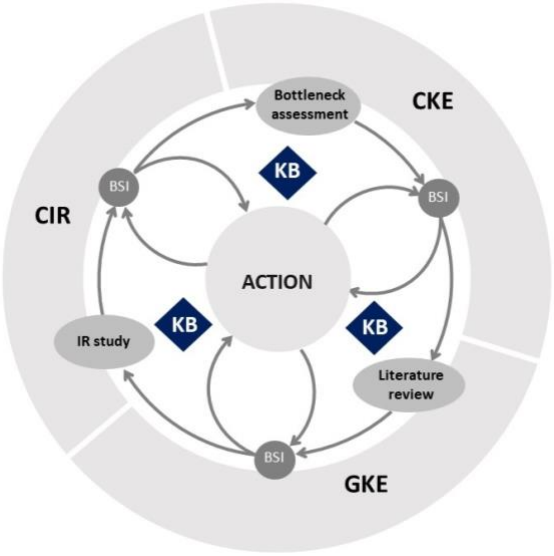
IR is one of three forms of knowledge that can help identify, understand and address implementation bottlenecks. It is especially time and resource-intensive and, as such, should be using methods that are timely, practical and appropriate to meet the needs of implementers.

Case study: IR

During ISI, the work carried out for IR has taken place in several phases. In both countries, the bottlenecks identified and prioritized guided the development of the research questions. Considering that the initial IR studies proposed focused on the service delivery system and on the supply chain system, both countries decided to add an additional study, using the FES approach, that could cover the user system to have a better picture of the whole situation around IFAS. In total, the development of the proposal and approval process took about 9 months in Uganda and 12 months in Kenya. The work continued with several activities to prepare the data collection: identification of the specific health facilities, training of data collectors, pilot-testing of data collection tools, and the development of a data collection plan.

In both countries, the COVID-19 pandemic put the process of data collection on hold for some time. While it resumed after a few months in Uganda, unfortunately the Kenya team could not proceed to the data collection and the IR studies were not completed. In Uganda, the data collection was initiated mid-2019 for the baseline and, after analysis, additional data collection took place in October 2019. The end line data were collected in August 2020, after restrictions due to the COVID-19 pandemic had been lifted. Comprehensive reports were produced to present the analysis in February 2020 and October 2020, and several presentations have been organized to share the findings with various stakeholders.

KNOWLEDGE BROKERING



OBJECTIVES

- Understand the roles, tasks and activities carried out by knowledge brokers in the context of ISN
- Examine the complementarity of having knowledge brokers and a knowledge brokering team

What are the characteristics of knowledge brokers?

In the context of ISN, there is a need to have someone who assumes the leadership for applying the ISS Operational Model to address program bottlenecks in a specific program in a timely and resource-efficient manner. This work fits into the function of a knowledge broker, which has been a core component in ISI. Knowledge brokers are individuals who are specifically tasked with facilitating the access, interpretation, adaptation and utilization of knowledge. Knowledge brokers are key for applying the ISS Operational Model and they can rely on the support of a knowledge brokering team. The box shown highlights the mains qualities and skills of knowledge brokers.

A major conclusion from the literature on knowledge brokering is that finding an individual who possess all the qualities necessary to perform knowledge brokering activities appears daunting and unlikely. This has led to the suggestion that knowledge brokers should be undertaken by collectives or teams rather than a single individual. Thus, one innovation in the ISI is to include knowledge brokering as a core component of the work and a second innovation is to use a team rather than individual approach of knowledge broker.

Knowledge brokers and knowledge brokering team

In ISI, the initial vision was that there would be a knowledge brokering team to carry out the various activities required for applying IS. The experience in Kenya and Uganda showed that the project coordinator was key to leading the core team and facilitating the application of IS in country. While several members of the core team were acting as the knowledge brokering team, the project coordinator played the lead role because this person was engaged in most if not all activities in the table. Thus, to use the ISS operational model, there seems to be a need for a knowledge broker who can carry out specific tasks that are illustrated in Table 3. Considering this set of activities, there is a need to ensure sufficient time for the project coordinator to carry out the additional work that may be required for applying IS and that involve knowledge brokering activities.

Box 5: Qualities and skills of knowledge brokers

- Respect (seniority, reputation, authority)
- Credibility (research, topic/content, government)
- Accessibility, responsiveness and flexibility for knowledge brokering roles and activities
- Reliability
- Self-confidence
- Motivational skills (enthusiastic and creative)
- Interpersonal skills and team builder
- Oral and written communication skills
- Tact, diplomatic and mediator
- Tireless commitment and determination
- Problem-solving skills
- Networking skills and an existing network
- Change management skills

Table 3: Knowledge brokering activities in the context of the ISS Operational Model

Steps of the ISS Operational Model	Knowledge brokering activities

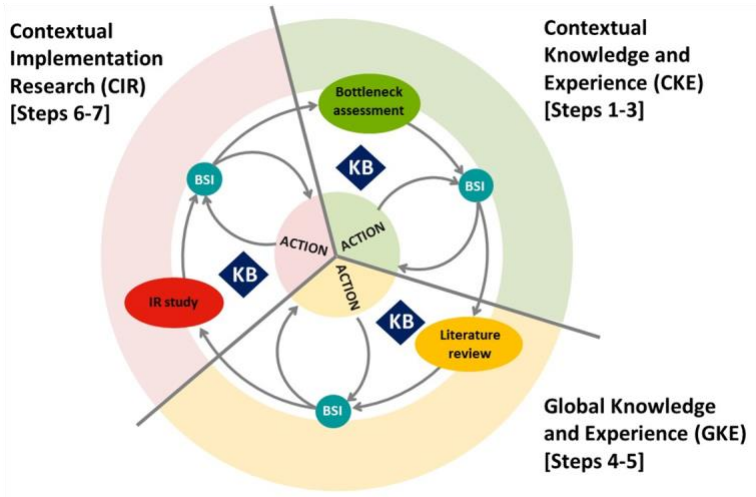
1. Bottleneck assessment (BNA)	- connect and maintain relationships among stakeholders - gather actors from different levels - gather preliminary data (assess local context) - facilitate the BNA workshop - build capacity around IS/IR - generate buy-in among actors - facilitate discussions - help the actors to prioritize the bottlenecks to be addressed - summarize the findings of the BNA - share and validate the findings of the BNA
2. Bottleneck and solution inventory (BSI)	- compile the findings of the BNA in the BSI - support actors to use the knowledge (BAR and action parts) - assess and address barriers to using the knowledge (BAR)
3. Action and BSI	- monitor, promote and support knowledge use (AAR) - evaluate the outcomes of using the knowledge (AAR) - compile the findings in the BSI
4. Literature review and BSI	- connect and maintain relationships among stakeholders - coordinate interactions between stakeholders - build capacity around literature review - retrieve, organize and share existing knowledge - compile the findings of the literature review in the BSI - help the actors to prioritize the next actions - support actors to use the knowledge (BAR and action parts) - assess barriers to using the knowledge (BAR)
5. Action and BSI	- monitor, promote and support knowledge use (AAR) - evaluate the outcomes of using the knowledge (AAR) - compile the findings in the BSI
6. Implementation Research (IR) study and BSI	- connect and maintain relationships among stakeholders - facilitate negotiations and decisions about IR purposes and topics - support actors to use the knowledge for IR (tailoring of the research questions, strengthening of a data collection tool, development of an intervention, adaptation of a research method, etc.) - build capacity around IR activities (data collection, research method, etc.) - assess and address future barriers to using the knowledge (BAR)
7. Action and BSI	- monitor, promote and support knowledge use (AAR) - evaluate the outcomes of using the knowledge (AAR) - compile the findings in the BSI

FINAL THOUGHTS AND CAVEATS

The ISS Operational Model of the ISN framework described in this guide emphasizes that there are three forms of knowledge that can assist in addressing implementation bottlenecks, and that the decisions about which forms to use in a given situation should take into account timeliness, practicality and the needs of decision makers.

These seemingly simple suggestions proved to be more difficult in practice during the work in Kenya and Uganda. In these settings there was a tendency to move immediately from the BNA workshop to the design of IR studies. This led the country team to invest most of its attention and resources on the intensive IR planning process (that gave rise to Table 2), such that efforts were not made to address some of the 'quick-win' bottlenecks that could have been addressed with existing contextual knowledge and experience (CKE) or global knowledge and experience (GKE). It is this experience that led us to formalize the ISS Operational Model shown in Figure 1 and reproduced below and to emphasize the potential value, timeliness and practicality of these other forms of knowledge.

Operational Model for an Implementation Science System (ISS)



That said, there are two caveats regarding a sequential model as depicted in Figure 1 and here.

First, in ISI the bottleneck assessment began with a PAG workshop that focused on bottlenecks in the delivery system. A PAG workshop is a powerful tool for that purpose but participants in such a workshop typically do not have detailed and context-specific knowledge regarding bottlenecks at household and community levels. As such, some type of IR at household and community levels would be needed early in the process. The Focused Ethnographic Study (FES) methodology was selected in ISI for that purpose.

Second, the PAG workshops provided a comprehensive view of the bottlenecks in the delivery system but, in some cases, there is a desire to focus on specific bottlenecks that are already well-known to implementers. In such cases, the process might begin with a literature search to identify potential solutions based on global knowledge and experience (GKE). Alternatively, if a particular solution has already been identified, it might begin with some form of IR to assess the feasibility of such a solution in the local context.

Finally, these caveats and cautions underscore the need for a careful and systematic process to identify when and for what purpose IR is needed, as well as the most practical and appropriate methods to be used. Knowledge brokers can play an important role in designing and facilitating a collaborative decision process among implementers and researchers, to ensure that the IR is relevant, pragmatic and timely in relation to the needs of implementers. Overall, the knowledge brokering activities illustrated in Table 3 are often invisible processes, but that are critical to apply ISN, which explain the central role of KB in the ISS operational model.

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