HSS Evaluation Collaborative

Principles for applying a systems approach to evaluations of health systems strengthening interventions: A practice brief

July 2022

Atif Adam, Ligia Paina, and Eric Sarriot

Contents

Introduction

The complexities arising from health systems have motivated calls for the application of systems thinking to both health systems strengthening (HSS) and the evaluation of HSS interventions. Health systems have layered histories – with diverse stakeholders and structures changing and amalgamating over time. Understanding and evaluating HSS needs to incorporate contexts and boundaries (e.g., Who is the evaluation for and what is the scope?). Recognizing that health systems actors (e.g., practitioners, policy stakeholders, and funders) often lack a common terminology for health systems, HSS, and systems thinking (Kwamie et al., 2021), we have adapted insights from Peters (2014), Reynolds (2011), and Williams (2006) to frame systems thinking as a process in order to better understand inter-relationships, to engage with multiple perspectives, and to define and reflect on boundary choices (Peters, 2014; Williams & Imam, 2006). Practical ways to use systems thinking, complexity thinking, and systems science in the evaluation of HSS interventions are currently missing.

The evaluation of HSS interventions (briefly summarized in Box 1) provides a vital learning opportunity on how HSS works and on whether it supports learning, adaptation, and developing people-centered health systems in a sustainable and equitable manner. HSS efforts often tend to focus on a pertinent and targeted health system need, usually in response to a health system signal (e.g., the prevalence of HIV going up, or a loss in the follow-up of HIV patients increasing). Similarly, HSS intervention packages are often designed to respond to the needs of specific disease programs or within only one of the health system building blocks. Investments in HSS are often scrutinized because their impacts are difficult to trace beyond disease or building block siloes. The fragmentation and difficulty of demonstrating quick and attributable wins complicates HSS evaluation, and leads to missed opportunities. The cross-cutting benefits of HSS interventions, beyond a single disease, are not immediately captured or assessed over the course of the intervention (Chee et al., 2013). Positive and negative spillovers or unintended effects are often defined outside the scope of an evaluation of a specific intervention. Positive spillovers are often unaccounted for because they are not recognized as being linked to the intervention (i.e., they may appear in a different area or after a long time), and this limits our understanding of the complete scope of the intervention's outcomes in the context. Finally, the relative complexity increases as different ripples of an intervention pass through different layers of a health system, and similar interventions can carry higher degrees of complexity, depending on the context. For example, introducing a new model for supportive supervision of community health workers will be simpler to evaluate in a system that

Box 1. What are HSS interventions?

WHO has broadly defined HSS as "any array of initiatives that improves one or more of the functions of the health system and that leads to better health through improvements in access, coverage, quality, or efficiency" (World Health Organization, 2019). More recently, Witter et al. proposed criteria for assessing what is HSS (Witter et al., 2019; Witter et al., 2021). These criteria include the intervention being as follows: (1) cross-cutting benefits beyond a single disease; (2) addressing identified policy and organizational constraints or strengthening relationships between building blocks; (3) producing a long-term systemic impact beyond the life of the activity; and (4) tailored to country-specific constraints and opportunities, with clearly defined roles for country institutions (Witter et al., 2021). Part of HSS interventions being tailored to a particular context also includes devising support to health systems that are under-resourced or under severe stress due to conflict or other emergency situations.

already has a culture of supervision, quality improvement, and learning, especially if it focuses on a narrow range of interventions.

Many HSS researchers and practitioners have proposed using systems thinking, complexity thinking, and systems science to appreciate health systems as complex, adaptive systems and to overcome the aforementioned challenges. However, systems thinking, and systems practices are not yet commonly used in HSS evaluations. Their operationalization lags due to a lack of consensus about the value that they add to HSS and HSS evaluations and to definitions (i.e., of health systems, systems thinking, and HSS interventions). While there are calls for HSS evaluation to be agile and responsive to complex interventions, this has not yet become common practice. Funders of HSS evaluations might be hesitant to invest funding in non-traditional evaluation practices. Practitioners of HSS evaluations might lack a reference to a common set of principles or guidelines for how to do so, they may also be unsure which principles to prioritize and of how to document them.

This brief presents some of the core principles stemming from systems theories that could help in the design and implementation of HSS evaluations. By grounding these principles in systems theories and by drawing out related implications for HSS evaluations, the intent of this brief is to reassure funders and HSS evaluation specialists of the potential that an intentional application of systems perspectives can have. It is an early attempt to help HSS evaluation stakeholders find robust theoretical grounding for their evaluation practice, to enrich the collective wisdom of evaluation practitioners.

In the first part of this brief, we focus on understanding some of the main characteristics of health system structures and behaviors. In the second part, we reflect on the principles that underlie common systems behaviors and that HSS evaluation can help to bring out. In the third part, we conclude with a summary of key messages and of the opportunities to build on the current work.

Part 1: Understanding health systems structure and behaviors

Health systems express systemic characteristics of different types, as follows:

- [Part of] health systems are purposive systems, which are created by societies with generally recognizable public (or private) service delivery. Through this lens, they are often hierarchical, representing organizations of different levels and sectors, which are tasked with missions described in policies, laws, agreements, and contracts (among others).
- Health systems can be mechanical through structures (primary, secondary, and tertiary), differentiated rooms (including operating rooms), ambulances, warehouses, trucks, and refrigerators (among others). These all require some interconnections.
- Health systems can also be biological, notably as clients, patients, providers, managers, viruses, bacteria, and toxins. These all circulate and create their own systemic behaviors, as recently demonstrated by efforts to put barriers in the interrelations of COVID-19, airways, and hands.
- Finally, health systems are purposeful, with institutions and individuals bringing professional (and personal) agendas to their interactions.

Only the first two of these four types of systems naturally produce order (good or bad) and some predictability. Biological and social systems, however, provide a great number of imponderables, which are often described through the language of complex adaptive systems. We may emphasize one or

another framing of health systems (notably the latter), but we must be aware that different systemic lenses can be used to describe a health system.

Health care organizations and health systems can function as simple or complicated units, depending on the scale and scope of the impact. It is difficult to completely predict the nature of these systems but there are important innate properties that are relevant to how we can view these systems structures. We begin by illustrating some characteristics. Health systems are open systems, comprised of multiple, interconnected (connected at multiple points or levels) and interdependent (reliant on one another) components, and have boundaries of operations and influence (see Box 2). In this section, we discuss the implications of these three characteristics for HSS evaluations and learning.

Box 2. System characteristics explained

Systems are commonly defined as "a regularly interacting or interdependent group of items forming a unified whole" (Merriam-Webster, 2022). They consist of elements, interconnections, and a purpose (Meadows, 2018) that, in health systems, are comprised of observable elements (such as, health workers, financial resources, health facilities, policies, and services delivered) working together toward the mission of enhancing population health and well-being (World Health Organization, 2007). Therefore, health systems can be defined as follows:

- **Open social systems** that are characterized by exchanges and a free flow of information or resources among system levels and components and between the system and the environment and are systems that adapt in response to these exchanges (including both people [agents] and processes/procedures [structures].
- **Interconnected structures that operate for a common purpose,** for example, mechanical structures (e.g., a building, a laboratory, or a telecommunication system) and human structures (e.g., trained cadres dedicated to specific roles and departments divided by roles and hierarchy). These structures also have **interdependent elements** (e.g., patient flow, politics, staffing allocations, and resource availability), which give rise to a system's collective behaviors, and its interactions and relationships with its environment (Bar-Yam, 2002).
- They have **boundaries** that are defined based on a population of interest (e.g., maternal and child health and oncology centers), spatial features, or even on time (e.g., COVID-19 vaccine mandates). Understanding the interdependence between different structures, actors, and elements is important when aiming to solve health systems' problems. Interventions introduced in one area of the system can have important and not always predictable effects in other parts of the system (Bar-Yam, 2002).

HSS evaluators should dedicate time to building program theories or similar reflection approaches. This should be done to anticipate and identify signals of both the desired and undesired effects of interdependencies by ensuring that the evaluation looks beyond the intervention itself. Evaluations of HSS interventions must, therefore, understand both the structure of the health system, the actors who are engaged, the power dynamics that draw them together, and the leverage points that the interventions imply (Meadows, 1999). They should purposefully avoid mimicking closed systems, which operate based on standardized structures and which frame HSS within the building blocks of individual diseases. Furthermore, they should not assume that health system actors are acting as rational agents and, therefore, insufficiently engage with

The evaluation of HSS interventions must consider the nature and process of change in the structures, behaviors, and purposes that interventions stimulate.

the political and power dynamics that underlie the priority setting and funding allocations. Agents might act rationally within their own logic, institutional incentives, norms, values, and power dynamics; however, not understanding or accounting for such interdependencies risks a failure to properly understand the context of system actions and behaviors. Furthermore, understanding how information and communication exchanges are networked within and between health system components is critical to assess the flexibility of a health system and its ability to change. Box 3 provides an example of how interconnectedness and interdependence might work in an HSS intervention.

Box 3. Reflecting on interconnectedness and interdependence when implementing community scorecards (CSCs).

Community and facility scorecards are social accountability mechanisms that can be used to hold duty bearers or service providers to account for services that are provided (Fox, 2015). They are used to facilitate a multi-step process of collective problem solving. Community members and service providers engage in discussions around priority service delivery areas, with service users providing feedback to service providers, based on recent experiences. Action plans are derived from this feedback to support the systematic improvement of service quality. The implementation of CSCs intends to change the relationships between service providers and community members, both by changing norms around how the two groups interact and solve problems, and by changing the production and exchange of information used in decision making.

The interdependence between communities and their health systems, and among the system components should be considered when evaluating such an intervention. On one hand, this intervention aims to improve the quality of care in a participatory fashion. CSCs are intended to shift the mindset with which health care services are approached and the power structure between patients and providers, as well as the culture of feedback and learning in the health system. On the other hand, CSCs might improve one part of the system but stimulate negative spill-over effects in others. For example, improving maternity services for women through the CSCs, might draw attention and resources away from diabetes or hypertension services.

Though there is always a balance between focus and comprehensiveness in evaluations, any specific evaluation effort necessarily brings some narrowing of scope by drawing boundaries around the problem, the outcomes of interest, and where and over what period they are evaluated. Systems thinking, complexity thinking, and systems science support a process to identify the main boundaries and to be explicit about the consequences of the choices made. Recognizing that boundaries are often defined by the dominant or most powerful perspective, key elements of critically examining boundaries center around the following questions, from Hummelbrunner (2011):

- Motivation: Who benefits and in what way?
- Control: Who does (and does not) have what resources?
- Knowledge: What expertise are honored or ignored?
- Legitimacy: What makes this the right thing to do – and who decides that?

These questions should be asked about HSS intervention design but are also helpful when designing and carrying out HSS evaluations.

Determining boundaries is important, not only for defining the health system or sub-systems affected, but also for defining the HSS intervention and the anticipated system change. However, the boundaries of the intervention and the boundaries of the potential effects are not the same. In Box 4, we propose a brief reflection on the boundaries related to the CSC example, introduced above.

Evaluations of HSS interventions should critique boundary decisions, including those about time horizons that are drawn around HSS interventions and around their evaluation (Hummelbrunner, 2011)

Box 4. Reflecting on boundaries for the implementation of CSCs

In CSCs, a discussion of boundaries begins at the design stage and should be revisited throughout the implementation and evaluation, as boundaries might change over time. For example, a community needs to be defined conceptually, and practically (i.e., geographically). The CSC intervention mechanisms would be regarded in the context of the accountability ecosystem. The intervention might need to create new health system structures and expand the health system boundaries (e.g., by bringing in new community-based or civil society organizations) or they may strengthen existing mechanisms and expand their scope (e.g., facility-based committees). The facility catchment area, in conjunction with community boundaries, often determine the geographic reach of a particular intervention. However, as these change over time, so would the involvement of actors and the activation of structures.

Some HSS interventions change over time and health systems are also constantly changing. Some of the system activities might stimulate quick, observable changes (e.g., a CSC reveals that the maternity beds are in disrepair, and the health facility is able to advocate for additional funding to repair or purchase new beds within the next quarter), while others stimulate observable change and transformation only over time (e.g., a CSC process is institutionalized and influences the yearly health system budgeting and planning process), while others might be neither observable nor quick (e.g., norms around providers seeking and accepting feedback from the community and not feeling under attack or scrutiny).

A pitfall of HSS evaluations is that they most often define a time horizon framed around single interventions, rather than around the timing of broader system change. This is the case due to resource constraints, funder timeframes, and the fact that most HSS programs last between three and five years at a time. This prevents evaluators from asking about the right effects but at the wrong time, or from aggregating variables at the wrong time.

In summary, the system characteristics and implications for HSS evaluations are presented in Table 1, below.

Table 1. Part 1: synthesis

System characteristics	Implications for HSS evaluations
Systems are open, interconnected, interdependent, and have temporal and geographic boundaries	▪ HSS evaluations must consider the nature and process of change in the structures, behaviors, and purposes that interventions stimulate. ▪ HSS evaluations should critique boundary decisions, including those around time horizons that are drawn around HSS interventions and their evaluation.

	○ The boundaries of the intervention and the boundaries of the potential effects are not the same. ○ HSS evaluations should define the time horizon around the timing of broader system change, beyond single interventions. ○ Boundary decisions are not all under the control of HSS evaluators. Funding for HSS and HSS evaluations often set time boundaries for HSS that are not relative to the desired system change, but relative to the resources and time available.

Part 2. Bridging Systems Principles to HSS Practice

Although this brief does not capture all the nuances of the field of systems science, it proposes three principles that have been drawn from systems theories to anchor the discussion on HSS evaluations.

1. Systems have complex structures with 'organized chaos'.
2. Systems can have unexpected outcomes and behaviors.
3. Complexity in organizations increases with recognizable parameters[1], leading to regularities in stresses and dysfunctions across organizational systems.

In this section we discuss the implications of each of the systems principles for HSS evaluations and learning.

Principle 1: systems have complex structures with 'organized chaos'

While health systems can appear completely unpredictable, within them are surprising patterns that might lead to some deeper revelations with appropriate evaluator mechanisms.

Chaos Theory and **Complexity Theory** look at the idea that every action has an effect, and that has its own effect, and so on. This cycle does not have to be a linear series of events and most of the time they are non-linear in nature (Murphy, 1996).

Box 5. The four features of chaos theory are as follows:

a) *Butterfly effect*: Actions can have consequences on parts of a system that appear unconnected. For example, a new health workforce policy will empower new health agents to carry out some tasks, but may miss the displacement of other agents from less, to more motivating tasks.

b) *Unpredictability*: The impacts of the actions are not deterministic. Outcomes in all systems consistently show variability and "chaotic behavior".

c) *Feedback*: Actions have an impact on the actors. Traditional exposure and outcome models fail to capture the impact of the outcomes on exposures. Feedback processes are closely tied to changing system behaviors over time (Murphy, 1996).

Hummelbrunner proposes that for interventions in the complex domain, "monitoring can be used to identify changes from initial conditions and capture emerging patterns, paying attention to even incremental changes" (Hummelbrunner, 2011). Developmental evaluation is an approach to facilitate systemic approaches in evaluation.

[1] For example, the number of 'agents' in the system, the diversity of the 'type' of agents, and their interconnections.

HSS evaluations should pay sufficient attention to how an intervention changes and is adapted as it percolates through a system, and the features of the context in which all this unfolds. HSS evaluations might find that HSS interventions are stable, with little adaptation when they reinforce existing norms and practices (e.g., training existing health cadres to improve the implementation of maternal and child services). However, HSS evaluations should be flexible to capture HSS interventions that are not stable – where learning and variability are to be expected (e.g., introducing a new health worker cadre) – and where such diversity can vary across the different scales in a health system (e.g., national, sub-national, facility, and community levels). The learning and variability, and, therefore, the unpredictability is more intense at times – linking back to the importance of understanding the time and geographic horizons of the intervention and its adaptation over time. Similarly, it can vary across health system sub-components – for example, when individual organizations act as complex adaptive systems. HSS evaluations can monitor and identify opportunities for learning and can fine-tune the evidence needed for more tailored investments in HSS by country governments and donors, alike. Therefore, the evaluation of the HSS intervention cannot and should not be dissociated from the learning by the actors of the health system itself. An increased measure of subjectivity is, therefore, injected when stakeholders consider evidence to assess the following question: "is our health system moving in the best possible direction for the future?" (World Health Organization, 2021).

The use of Chaos Theory and understanding the fractal nature of systems to inform HSS evaluations can help to better understand how and why health systems structures, policies, and practices are in place.

Principle 2: systems can have unexpected outcomes and behaviors

Box 6. Features that lead to emergence

While emergence itself can be hard to predict, there are some principles that allow us to look for and anticipate such behavior within a system. They are as follows:

a) **Condition of Emergence:** Emergence will not occur in static systems that are not under active influence. A key condition (Goldstein, 1999), or a critical state, has to exist prior to the occurrence of emergence.
b) **Emergent behavior is inversely proportional to control within a system:** The more tightly the component systems are coupled, the less likely it is that the global emergent behavior will prevail. For emergent behaviors to arise, system units and elements wholly operating under rules and goals should allow a fair degree of autonomous decision making.
c) **Emergent behavior is non-linear and self-organized:** Emergent behaviors are closely tied to the properties of chaos behavior (e.g., the butterfly effect, unpredictability, and feedback) and to the connectivity patterns between system units (e.g., openness, interrelationship, and interdependence) (Walleczek, 2006).
d) **Emergence exhibits a 'bottom-up approach'** (rather than a 'top-down' approach): This is where individual system units could have pervasive effects on global behavior (Johnson, 2000).

Principle 3: Complexity in organizations increases with recognizable parameters, leading to regularities in stresses and dysfunctions across organizational systems.

HSS evaluations across levels need to not only look at the hierarchy of health systems (e.g., policies, resources, programs, management, and operations) but also at the viability of organizational functions, level by level.

Understanding health systems from the most micro to the most macro levels is a journey through this expanding complexity. This includes understanding the organizations that constitute the system and their management. Organizational or institutional complexity creates unavoidable demands and stresses that lead to functional and dysfunctional behaviors in the health system. This manifests itself in a poor quality of services, or an inability to implement annual workplans.

The Viable System Model (VSM) is a system science approach to assessing and evaluating organizational structures (Beer, 1984). Its purpose is to explain "how organizations can continuously adapt to changing environments by harnessing the principles of complexity and variety management" (Lowe et al., 2020). It identifies the capabilities of an organization to remain viable and to adapt despite the turbulent operating conditions that many health service organizations face in the present. The shock of the COVID-19 pandemic is one of these turbulences. The closing of rural hospitals due to demographic shifts and urbanization is another. The VSM process can guide HSS evaluations through three distinct processes, which contain the following sub-processes or steps, as described by Lowe et al.: (1) defining the system in focus; (2) identifying and assessing the sub-systems within the system in focus; and (3) identifying and assessing the interactions within the system in focus (Lowe et al., 2020). The VSM assessment is designed as a self-evaluation, carried out by practitioners who are responsible for delivering the intervention, calling attention to the importance of strong monitoring, evaluation, and learning features being built into HSS and to embedded evaluation approaches. A self-evaluation means that there is a risk of subjectivity – but this can be overcome by having a team-based approach to the assessment, and by obtaining a commitment to repeat the assessment and to track changes over time.

The system principles and associated implications for HSS evaluations are synthesized in Table 2, below.

Table 2. Part 2: synthesis

Systems principles	HSS Evaluation Implications
Systems demonstrate 'organized chaos' behavior and emergent trends	▪ HSS program theories should look beyond the intervention itself to anticipate and identify signals of both the desired and undesired effects of interdependencies, which arise from implementing HSS. ▪ Evaluations should recognize and monitor the process of adaptation and interaction, recognizing that there are always areas in the system that are not fixed, and that the extent of turbulence within the system cannot be specified. ▪ HSS evaluators should mind initial assumptions that may balloon into major effects when systems overlap, interact, and coevolve, creating unintended consequences. ▪ HSS intervention cannot and should not be dissociated from the learning by the actors of the health system itself.
System models can scale and grow organically	▪ HSS interventions adapt over time, and their evaluations must be flexible and adaptive to capture how the intervention is defined: o Emergent behaviors can support innovation and growth in health systems but can also be undesirable. o Geographic boundaries are porous and system-wide actions and are often difficult to contain. ▪ The evaluation of HSS interventions must consider the nature and process of change in the structures, behaviors, and purposes that interventions stimulate. ▪ It is important for health evaluators to consider workflow and pipelines to associate the key antecedent conditions to the present status throughout several contingent, chronologically ordered steps.
Complexity in organizations increases with recognizable parameters, leading to regularities in stresses and dysfunctions across organizational systems	▪ **HSS evaluations across levels need to not only look at the hierarchy of health systems (e.g., policies, resources, programs, management, and operations) but also at the viability of organizational functions, level by level.** ▪ Health system stakeholders can determine whether and how health system organizations stabilize or reach equilibrium after encountering shocks within the bounds of constraints (e.g., resources, time, and actors), while continually pursuing viability and sustainability. VSMs can also help health system stakeholders to monitor organizational adaptations and learning over time.

Part 3: key messages and future directions

We conclude with a synthesis of the implications for the HSS evaluation mentioned thus far and with a reflection on the limitations of this current brief. We have separated these for two audiences – the funders and the implementers of HSS evaluations. We made this distinction to recognize that the incentives, knowledge needs, and the level of interest varies among the two groups.

We make the following suggestions for funders who commission HSS evaluations:

- Encourage implementers of HSS to develop program theories that reflect on how they expect change and how fast they anticipate it to happen.
- Ensure sufficient time and resources are allocated to HSS evaluation teams to conduct analyses of health system structures, the actors who are engaged, and the power dynamics that draw them together, as well as to question the program theories developed by implementers – first, at the design stage of HSS interventions and, second, at the evaluation stage.
- Support agile and flexible evaluation designs and evaluation periods, which allow for the evaluation to adjust to changes on the ground and to capture positive and negative externalities. Support embedded, developmental evaluation, and realistic evaluation designs that can capture the changes to a health system in close to real time and to be able to learn from pilot and implementation efforts.
- Differentiate evaluation questions about the performance of specific services in a health system, for example, questions about strengthening the multiple units that form a system. This differentiation has implications for time, the participation and ownership of stakeholders, and for a combination of methods.
- Differentiate evaluations of the immediate performance of an intervention on a limited-scale intervention, from the requirements of systems-transformative efforts, affecting multiple, diverse, interconnected elements of a system. This is often observed with scale, but not exclusively – it could also be a matter of looking at different services within the same service structure or a single district or looking at interactions between community levels and in-facility providers. It can also depend on the generation of new interconnections (as caused by social accountability interventions, or the integration of operational or support functions).
- Support and advocate for candid and reflexive evaluations, which grapple with whether the HSS interventions were too focused (i.e., they ignored the surrounding system elements), or too broad (and, thus, were not able to cause meaningful change).

Although the upfront time investment might be greater, having HSS evaluations inform HSS intervention designs in real-time could save funders' resources in the medium to long term, by ensuring that constant learning helps to refine HSS activities.

In turn, we make the following suggestions for HSS evaluation teams:

- Document and report on how the intervention and the health system's context changes over time. To judge whether we have strengthened a health system, we also need to consider how the changes brought about by our interventions in elements of the health system (including the people who operate these elements under the interventions) affect other people and structures in the health system.

- Use a program theory, not only to define the original evaluation questions and to document initial assumptions, but also to monitor how they change over time. They should also use them to reflect on and hypothesize about positive and negative externalities.
- Build in feedback between HSS evaluation and HSS interventions, especially when a high degree of adaptation is expected in the HSS intervention implementation. Evaluation needs to provide on-going, real-time and rapid feedback for implementers, and this would ideally be conducted prospectively, not only retrospectively.
- Ensure that process measures and outcomes related to system change are receiving adequate attention, in addition to the outcomes of the intervention itself. HSS interventions are often channels for broader system change. HSS evaluation tries to ask what is likely to happen next, beyond the immediate intervention effects.
- Ensure that learning from the process of implementation in an embedded and action-oriented way is part of the evaluation.
- Where appropriate, work with health system organizations to set up regular assessments, with feedback loops from findings to practice, for learning about and understanding adaptation.
- As the complexity and the scale of institutional change increases, value the experience of practitioners and managers, but also become familiar with and be able to explore how parameters for the viability (strength) of systems are respected.
- Ensure that the evaluation approach and methods match the nature of the situation.

Ensure that the evaluation teams are ready and confident to apply a systems lens to their HSS evaluations. Because of the need for multi-method and multidisciplinary perspectives, HSS evaluations need to have special considerations for evaluation capacity. Funders who commission evaluations and evaluators themselves need to map the system under study, not simply to understand its geographical and institutional anchoring, but also to question the relative complexity of the environment that an intervention will affect. While complexity is hard to assess, relative complexity can be appreciated as a scale, the details of an intervention, and as the plurality of stakeholders increases.

Future directions

We feel optimistic about the opportunity that these principles bring to evaluation and propose a long-term commitment to refining evaluation practice. This brief cannot be comprehensive at this time due to the limited time for reflection and consultation; therefore we intend it to be a living document and a starting point for stimulating further discussion. As an overview, this brief also has boundaries of use. They are as follows:

1. It aims to help guide HSS planners, helping them to understand the systems language commonly used in reports, manuscripts, and briefings.
2. From a practice-based research perspective, this brief aims to help think through knowledge gaps that exist between ‘systems in reality’ and ‘systems under evaluation’.
    a. In reality, the structure of health systems is complex. This complexity has theoretical grounding and is also found in other systems around us.
    b. In reality, health systems are impacted by various influences at different levels, and these have to be understood and examined during evaluation exercises.
    c. In reality, health systems are a lot more interconnected than anticipated; interventions within one part of the system can impact another (seemingly unconnected) part of the system.

3. We are not focusing on application aspects of systems thinking, complexity thinking, or systems science, as related to HSS planning or evaluations. This is not an implementation guide on systems methodologies and tools and their utilization; however, we recognize that this is an important area that researchers and practitioners continue to grapple with.
4. From an HSS evaluation perspective we do not go into details on well-functioning information systems and high-quality data (important in tackling issues pertinent to complexity).
5. Out-of-scope of this brief are examples and models for building the involvement and support of health system stakeholders.

We hope that the broader community will continue to contribute to this initial discussion and grow it over time, especially for the sake of more effectively documenting how decisions are made for framing and evaluating HSS interventions, but also for the collective learning and partnership between practitioners, policymakers, and HSS evaluators. This exercise is merely a first step, carried out rapidly, obtaining valuable inputs from rapid consultations. We hope that this first step suggests a way forward and that an attempt to link best practice in HSS evaluations to robust multidisciplinary theory and first principles about how the social and institutional world of health systems work will be of value. Future iterations of the content in this brief could distinguish between the messages to the funders of HSS evaluations and those to the implementers of HSS evaluations.

Annex 1. References

Akmal, A., Podgorodnichenko, N., Foote, J., Greatbanks, R., Stokes, T., & Gauld, R. (2021). Why is Quality Improvement so Challenging? A Viable Systems Model Perspective to Understand the Frustrations of Healthcare Quality Improvement Managers. *Health policy (Amsterdam, Netherlands)*, *125*(5), 658–664. https://doi.org/10.1016/j.healthpol.2021.03.015

Bar-Yam, Y. (2002). General Features of Complex Systems. Knowledge Management, Organizational Intelligence and Learning, and Complexity- Vol. I

Beer, S. (1984). The Viable System Model: Its Provenance, Development, Methodology and Pathology. *The Journal of the Operational Research Society*, *35*(1), 7–25. https://doi.org/10.2307/258192731.

Canavesio, M. & Martinez, E. (2005). A fractal model for enterprise networking in the specialty chemical industry using projects. *Proceeding of Second Mercosur Congress Chemical Engineering and Fourth Mercosur Congress on Process System Engineering*.

Canavesio, M.M., & Martinez, E. (2007). Enterprise modeling of a project-oriented fractal company for SMEs networking. *Computers in Industry*, *58*(8–9), 794–813.

Chee, G., Pielemeier, N., Lion, A., & Connor, C. (2013). Why differentiating between health system support and health system strengthening is needed. *The International journal of health planning and management*, *28*(1), 85–94. https://doi.org/10.1002/hpm.2122

Deng, X., Peng, J., & Huang, H. (2009). Research on the fractal company modeling based on competence. *16th International Conference on Industrial Engineering and Engineering Management*, IEEE, 2136–2140. doi: 10.1109/ICIEEM.2009.5344226.

Flood, R.L. & Jackson, M.C. (1991). Total systems intervention: A practical face to critical systems thinking. *Systems practice, 4*(3), 197–213.

Fox, J.A. (2015). Social Accountability: What Does the Evidence Really Say? *World Development*, *72*, 346–361. https://doi.org/10.1016/j.worlddev.2015.03.011

Goldstein, J. (1999). Emergence as a Construct: History and Issues. *Emergence: Complexity & Organisation*, *1*(1), 49–72. DOI:10.1207/s15327000em0101_4

Hummelbrunner, R. (2011). Systems thinking and evaluation. *Evaluation*, *17*(4), 395–403. https://doi.org/10.1177/1356389011421935

Johnson, S. (2000). *Emergence: The connected lives of ants, brains, cities, and software*. Simon and Schuster.

Kwamie, A., Ha, S., & Ghaffar, A. (2021). Applied systems thinking: unlocking theory, evidence and practice for health policy and systems research. *Health policy and planning*, *36*(10), 1715–1717. https://doi.org/10.1093/heapol/czab062

Lowe, D., Espinosa, A., & Yearworth, M. (2020). Constitutive rules for guiding the use of the viable system model: Reflections on practice. *European Journal of Operational Research*, 287(3), 1014–1035.

Meadows, D.H. (1999). *Leverage Points: Places to Intervene in a System*. The Sustainability Institute: Hartland, VT.

Mandelbrot, B. (2014). *The fractalist: Memoir of a scientific maverick*. Vintage.

Meadows, D.H., (2008). Part one: System Structure and Behavior, in *Thinking in Systems: a primer*, D. Wright, (Ed). Chelsea Green Publishing Company: White River Junction, VT.

Merriam-Webster. (n.d). Semantics: System. Retrieved on 3 January, 2022, from: https://www.merriam-webster.com/dictionary/system

Mugurusi, G. & De Boer, L. (2014). Conceptualising the production offshoring organisation using the viable systems model (VSM). *Strategic Outsourcing: An International Journal*, 7(3), 275–298 DOI:10.1108/SO-10-2014-0026

Murphy, P. (1996) Chaos theory as a model for managing issues and crises. *Public Relations Review*, 22(2), p. 95–113.

Peters D. H. (2014). The application of systems thinking in health: why use systems thinking? *Health research policy and systems*, *12*, 51. https://doi.org/10.1186/1478-4505-12-51

Reynolds, M. (2011). Critical thinking and systems thinking: towards a critical literacy for systems thinking in practice. In: Horvath, Christopher P., and Forte, James M. eds. *Critical Thinking.* New York, USA: Nova Science Publishers, pp. 37–68.

Sarriot, E. G., Winch, P. J., Ryan, L. J., Edison, J., Bowie, J., Swedberg, E., & Welch, R. (2004). Qualitative research to make practical sense of sustainability in primary health care projects implemented by non-governmental organizations. *The International journal of health planning and management*, *19*(1), 3–22. https://doi.org/10.1002/hpm.743

Sarriot, E., & Kouletio, M. (2015). Community health systems as complex adaptive systems: ontology and praxis lessons from an urban health experience with demonstrated sustainability. *Systemic Practice and Action Research*, *28*(3), 255–272. https://doi.org/10.1007/s11213-014-9329-9

Sarriot, E., Sacks, E., & Larson, A. (2016). Self-organization and emergence in global health. Insights from practice, blind spots and possible contributions from complexity science. *International Journal of Design & Nature and Ecodynamics*, *11*(4), 644–653 DOI:10.2495/DNE-V11-N4-644-653

Tharumarajah, A., Wells, A.J., & Nemes, L. (1998). Comparison of emerging manufacturing concepts. *SMC'98 Conference Proceedings. 1998 IEEE International Conference on Systems, Man, and Cybernetics (Cat. No.98CH36218), 1*, 325-331 vol.1.

Walleczek, J. (Ed) (2006). *Self-Organized Biological Dynamics and Nonlinear Control: Toward Understanding Complexity, Chaos and Emergent Function in Living Systems*, Cambridge University Press. DOI:10.1017/CBO9780511535338.012

Warnecke, H. (1993). *The Fractal Company: a Revolution in Corporate Culture*, Springer-Verlag, Heidelberg, New York.

Williams, B., & Iman, I. (Eds.). (2006). *Systems Concepts in Evaluation: An Expert Anthology.* Point Reyes, CA: EdgePress.

Witter, S., Palmer, N., Balabanova, D., Mounier-Jack, S., Martineau, T., Klicpera, A.,Jensen, C., Pugliese-Garcia, M., Gilson, L. (2019). Health system strengthening—Reflections on its meaning, assessment, and our state of knowledge. *The International Journal of Health Planning and Management*, *34*(4): e1980–e1989. https://doi.org/10.1002/hpm.2882

Witter, S., Palmer, N., Balabanova, D., Mounier-Jack, S., Martineau, T., Klicpera, A.,Jensen, C., Pugliese-Garcia, M., & Gilson, L. (2021). *Evidence review of what works for health systems strengthening, where and when?* The ReBUILD and ReSYST research consortia for FDCO. https://www.rebuildconsortium.com/resources/evidence-review-of-what-works-for-health-systems-strengthening-where-and-when/

World Health Organization. (2019). *Health Systems Strengthening Glossary*. [cited 2019]; Available from: https://www.who.int/healthsystems/hss_glossary/en/index5.html.

World Health Organization. (2007). Everybody's business: strengthening health systems to improve health outcomes, in *WHO's framework for action*. https://www.who.int/publications/i/item/everybody-s-business----strengthening-health-systems-to-improve-health-outcomes

World Health Organization team. (2021). *Learning health systems: pathways to progress: flagship report of the Alliance for Health Policy and Systems Research*. Sheikh, K., & Abimbola, S. (Eds). Geneva, Switzerland. https://apo.who.int/publications/i/item/learning-health-systems-pathways-to-progress

itad

Itad.com @ItadLtd

Itad is a global organisation. Our strategy, monitoring, evaluation and learning services work to make international development more effective. We generate evidence on important issues – from malnutrition to migration – to support our partners to make informed decisions and improve lives.