



Health system strengthening interventions: Making the case for impact evaluation

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Investing in health system strengthening interventions for which the impact is unknown requires concomitant investments in impact evaluation to understand what works, given the immense consequences of failed health systems on morbidity and mortality worldwide.

For drugs and medical technologies, the standard of efficacy is the randomized controlled trial. The strongest evidence is required prior to technology use – even in the case of cosmetic drugs. In contrast, health systems interventions are frequently implemented based on theoretical grounds of potential effectiveness rather than actual evidence. In low-income settings, enormous numbers of lives are lost because of continued long-standing weaknesses in health systems that impede performance and absorption capacity, and prevent sustained gains in coverage and health outcomes.¹ Investing in large-scale health system strengthening interventions requires concomitant investments in impact evaluation to understand what works, given the immense consequences of failed health systems on morbidity and mortality worldwide.

Generating knowledge about the kinds of programs that are really effective in strengthening health systems, however, has proven difficult for a number of reasons. There are few incentives to conduct research and evaluation among governments, bi- and multi-lateral donors, and aid agencies; in many contexts political and financial obstacles exist, and technical capacity required to design rigorous evaluations and analyze the data to demonstrate impact is weak.

This paper focuses on impact evaluation, defined as an evaluation of change caused by an intervention. This is distinct from formative and process evaluations, which aim to provide feedback for improving program performance and implementation (Box 1). This brief:-

- Discusses health systems strengthening interventions, and illustrates the gap in knowledge about what works;
- Explains why routine management data about programme performance may be insufficient to evaluate impact;
- Discusses best practices to improve the quality and strength of impact evaluations;
- Provides suggestions for developing country governments and the donor community in promoting impact evaluation and evidence-based health system strengthening. ■

BOX 1

What do you mean by ... ?

Evaluation – The systematic assessment of the value, merit, significance, quality, or state of affairs of an intervention, product, person, policy, proposal, or plan.

Formative Evaluation – An evaluation that takes place while an intervention is ongoing and that provides feedback for improvement.

Process Evaluation – An evaluation of the activities and events that occur as an intervention is delivered.

Impact Evaluation – An evaluation of changes (positive or negative, intended or not) caused by an intervention.

Prospective evaluation – An evaluation that is planned in advance or at the same time the intervention is being planned.

Ex-post evaluation – An evaluation that is conducted after an intervention has been implemented or completed.

Sources: Adapted by authors from Conner Snibe, A. "Drowning in Data," Stanford Social Innovation Review Fall 2006: 39-45. Baker J, Evaluating the Impact of Development Projects on Poverty, The World Bank 2000; European Environmental Protection Agency glossary.

The evidence gap for health system strengthening interventions: an example of in-service training

In this brief, health systems strengthening interventions are defined as those that address barriers and constraints at different levels of the health system with the overall goal of improving health outcomes. Box 2 presents several commonly reported health system barriers at different levels of the health system. At the central level, a common barrier is low priority for health as measured by low levels of public spending as a proportion of GDP. Within central Ministries of Health, inadequate health worker salaries or constraints linked to inflexible administrative

structures can prevent the retention and motivation of qualified staff. Among regional or local health management, resource barriers such as irregular cash flow or shortages of qualified staff weaken the performance of the health system. At the facility level, health workers might not know clinical guidelines or simply fail to put them into practice because of incentives within the organizational or financing system. Households might not routinely seek preventive care because they do not see its value or low quality services prevent them from seeking care. They might also utilize informal practitioners that do not adhere to minimum standards because of convenience, privacy, or perceived high quality. All of these health system issues can be seen across different settings in both developed and developing countries.

The last column of Box 2 lists possible interventions, some of which have been implemented to address these health system barriers. We examine in detail the evidence for one of these interventions: in-service training for health workers. Enormous amounts of resources have been dedicated to training programs to improve different aspects of health provider practice, update skills, introduce new pharmaceuticals or clinical protocols, or improve reporting and management. This is done in recognition that simply disseminating information and guidelines has little effect on health provider behavior.² A very small proportion of these trainings are formally evaluated, however – because it is generally assumed that training is effective. But what does the evidence show?

An overview of systematic reviews included four papers that assessed the evidence on training health workers, including in low and middle income settings.³ The four papers included 30 studies based on strong evidence as indicated by their design (randomized controlled trials, pre-post evaluations with control groups, or interrupted time series).^{4 5 6 7} The authors concluded that the results for training interventions were mixed. The successful interventions included multi-method training approaches and problem-focused groups. Among the remaining that had low or little impact included the traditional didactic, single-session, and large group trainings. The effects of the same intervention varied by setting; for example, interactive workshops demonstrated no significant effect in one setting compared with large changes in another setting.

Interventions: the case for impact evaluation

BOX 2

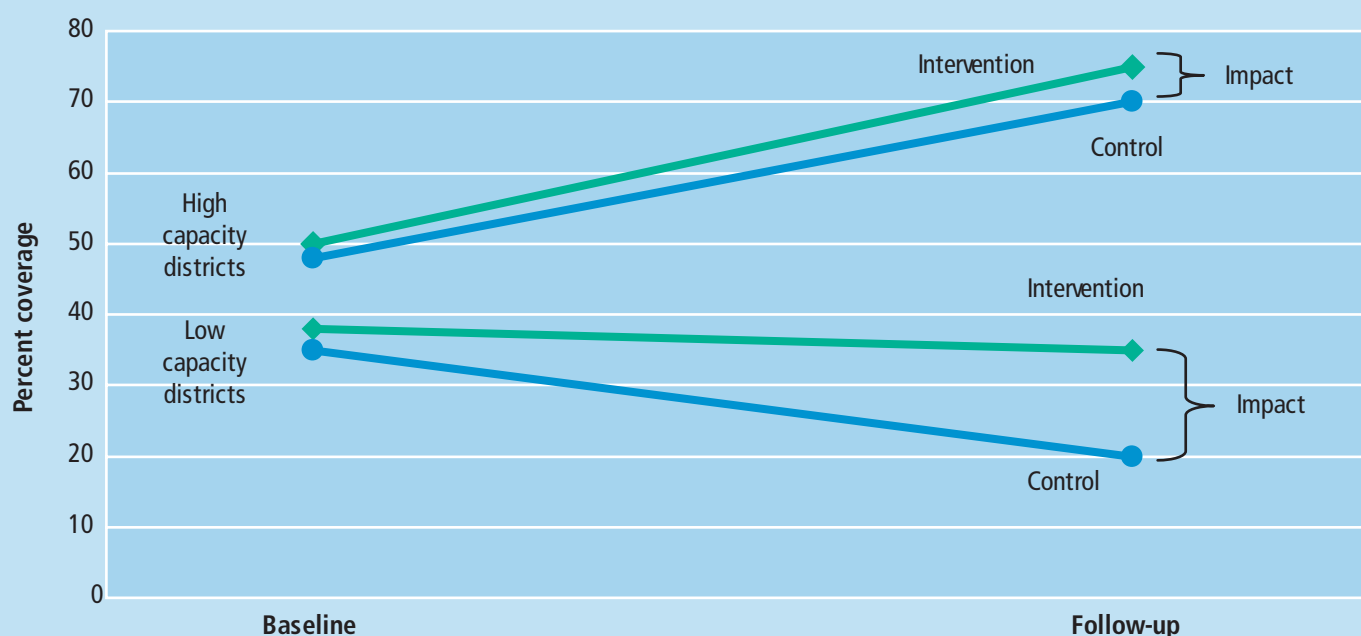
Level and types of health system barriers and possible interventions

Level of barrier	Common types of barriers	Possible information, organizational, or financial intervention
Central government	Low priority to health in development	Information: cost-effectiveness studies
Central ministry of health	Low salaries for health workers	Organizational: administrative reform
Health management	Irregular budget release Qualified staffing shortages	Organizational/financing: Improved financial management, contracting out private providers Organizational: incentives to retain health workers, service integration to make better use of available health workers
Health facility	Health workers do not know protocols Health workers know protocols but do not carry them out	Organizational: in-service training Financial: health provider incentives Organizational: strengthened supervision
Household	Low demand for preventive health care High utilization of informal practitioners that do not adhere to minimum standards of care Low quality prevents seeking care	Financial: conditional cash transfers Information: quality reporting Organizational: accreditation

Sources: Some information adapted from Hanson, K., K. Ranson, V. Oliveira-Cruz, and A. Mills. 2003. "Expanding Access to Health Interventions: A Framework for Understanding the Constraints to Scaling Up." *Journal of International Development* 15 (1): 1–14; and also Barber S.L. «The importance of quality of care in developing countries, its measurement, and selected quality improvement programs and policies," Working paper.

BOX 3

Comparing performance and impact for a hypothetical intervention placed in regions with high and low capacity



So what does this tell us? *First*, using training as an example, the systematic reviews identified relatively few studies that evaluated impact. To varying degrees, evidence gaps can be identified for the other interventions listed in Box 2.⁸ This suggests that important gaps in information exist about the impact of commonly implemented interventions, such as training, that are widely assumed to be effective. *Second*, the magnitude of the impact on health worker performance and knowledge was not consistently high and a substantial number of the studies in the review reported little or no improvements from training when study designs with control groups were used. Given the substantial investment made in in-service training, this implies that existing evidence about different training approaches may not be effectively communicated or used in funding and implementation decisions. *Third*, training health workers can help address deficiencies in knowledge or skills; however, broader health systems factors determine motivation and performance, which, in turn, affects whether clinical protocols are delivered correctly. ■

Why don't routine data allow for evaluation of program impact?

Two very broad types of research questions are those about performance and those about impact.⁹ Questions about performance focus on the intervention itself, its provision, utilization, and coverage. This type of question can usually be answered by administrative data, and informs project managers about decisions to improve availability, acceptability, and coverage of a given intervention. Questions about impact assume that performance is optimal, typically utilize primary data collection methods such as household surveys, and inform project managers, policy-makers, and funders about whether to continue or change a project.

Conducting formal high-quality impact evaluations can be complex and costly. Therefore, many managers or funding organizations simply ask health staff to report performance outcomes that are routinely collected in health information systems, such as coverage or utilization. Whereas routine data can be an important means to monitor performance over time,

the problem arises when such outcomes are confused with impact – or the change attributable to a specific program. This is particularly important in health because health resources are quite often selectively allocated – that is, interventions are targeted to regions or populations for specific reasons, such as high health needs or weak capacity.

Suppose that a health system strengthening intervention was implemented in a region where capacity was low – for example, an area of civil conflict, a remote region that cannot retain qualified staff, or a rural area with transportation and communication problems (see Box 3).¹⁰ As illustrated at the bottom of the



graph, coverage for the intervention group in the low capacity region declined by 3 percentage points. But was the intervention a failure? To determine impact, we compare the coverage in the intervention region with coverage in another region with low capacity – one that faced the same constraints but no intervention was implemented. In the control region during the same period, coverage declined by 15 percentage points. Therefore, despite the decline in coverage in both intervention and control areas, the impact of the intervention is positive.

Health programs are also selectively allocated to areas where capacity for implementation is high – perhaps because health managers want certain programs to succeed or be implemented quickly. This situation is illustrated at the top of the same graph.

While coverage in the intervention region increased by 25 percentage points, coverage in the control region also increased (by 22 percentage points) – even without the intervention. In this example, the more successful program (with the largest impact) was in the region with low capacity. Despite having a decline in coverage, the impact was greater (12 percentage points) in the low capacity region relative to the high capacity one (3 percentage points).

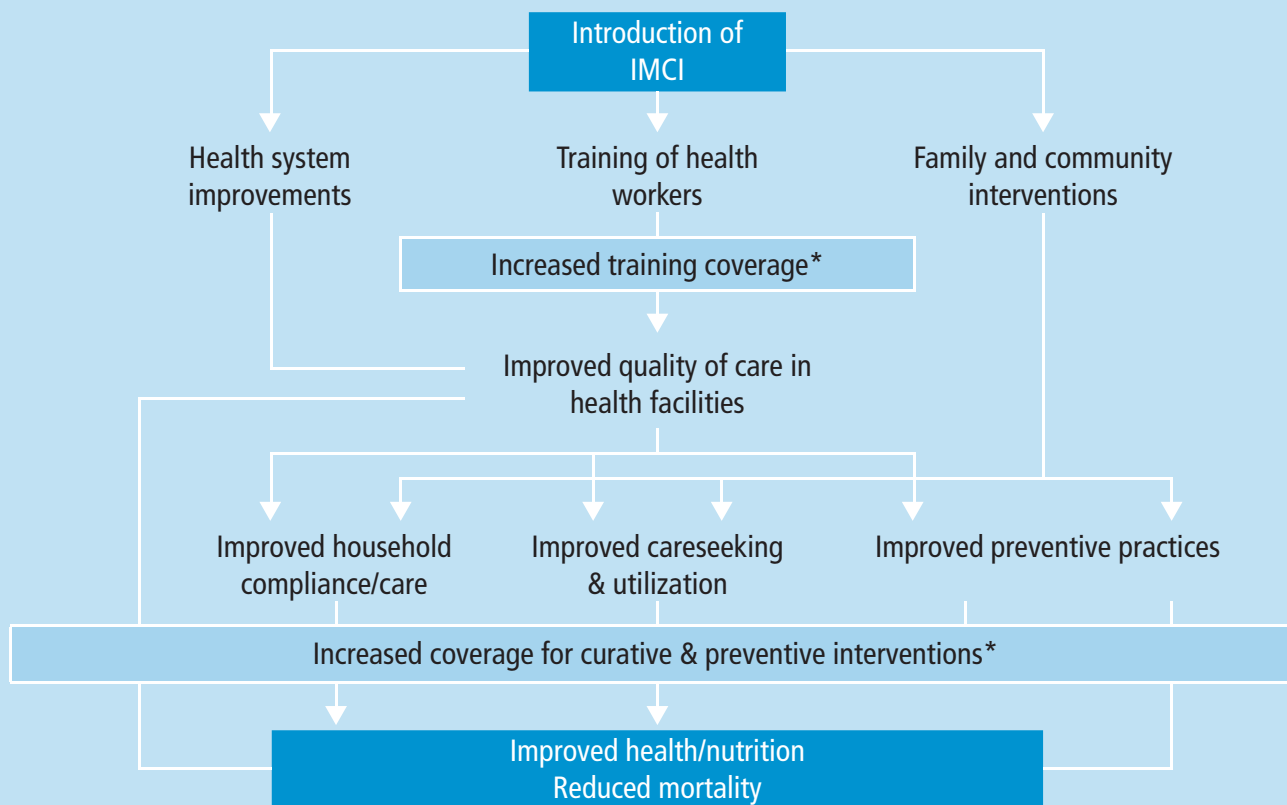
This example illustrates several points. *First*, evaluating interventions based on performance outcomes alone could lead to the wrong conclusions because such outcomes can be influenced by a range of factors – including social and economic change, civil unrest, or basic transportation and communication that influence intervention effectiveness as well as health-seeking behaviors. *Second*, using performance outcomes to make decisions about allocating resources could result in funding the wrong programs. This could translate to funding ineffective programs implemented in areas where positive change would have happened anyway – or not funding effective programs that have been implemented in difficult areas because their actual impact was never measured. *Third*, fear of reporting negative outcomes can also provide perverse incentives in deciding where programs will be allocated. If program managers know that their funding will be reduced if negative outcomes are reported, they have an incentive to implement programs in areas with high capacity or good transportation and communication – where they are certain that the program will succeed. This implies that innovative programs might not reach poor or marginalized populations – or those groups that have the most to gain from health system strengthening. ■

Best practices for impact evaluation

Several factors can improve the quality and outcome of impact evaluations for health systems strengthening interventions:

Mapping out the causal pathways, outcomes, and modifying factors. Even among basic health interventions, the causal pathways from an activity, drug, or technology to a health outcome can be very complex – for health system interventions such as decentralization or community based health insurance, causal pathways can be extremely complicated. It is particularly

Impact model mapping out the causal pathways from the IMCI intervention to improved health outcomes



* Added later as a result of MCE-IMCI findings.

Bryce J, Victora CG, Habicht JP, Black RE, Scherpbier RW; MCE-IMCI Technical Advisors. Programmatic pathways to child survival: results of a multi-country evaluation of Integrated Management of Childhood Illness. *Health Policy Plan*. 2005 Dec;20 Suppl 1:i5-i17. http://heapol.oxfordjournals.org/cgi/content/abstract/20/suppl_1/i5

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important, therefore, to map out a logical sequence between health system interventions and outcomes, to identify the most important structural constraints in the health system in addition to individual behavioral factors that modify these relationships.

The multi-country evaluation of the Integrated Management of Childhood Illness (IMCI) training intervention provides an example of an impact model (Box 4). The figure starts with the training intervention and leads to an increased number of trained health workers. From this point, the path to improved health requires that health system improvements, such as increased availability of drugs and supplies, lead to improved technical quality. In order to have an impact on health, households need to utilize the improved services and comply with

medical care received – this can be promoted through family and community interventions. This combination of interventions should lead to increased coverage of curative and preventive services and hence improved health outcomes.

However in practice it was found that in many countries the planned family and community interventions were slow to materialize, and much greater efforts to strengthen weak health systems were needed. As a consequence of the failure to meet the expectations regarding health system improvement and community interventions, much of the anticipated impact of IMCI failed to materialize.

Selecting the appropriate evaluation design

- **Non-experimental designs** may use existing program or secondary data, or collect supplementary data. They provide the weakest evidence of impact because non-experimental designs do not control for external influences on health outcomes, such as secular trends, national level interventions, other interventions occurring simultaneously, or general health service availability and quality.
- **Quasi-experimental designs** with external controls aim to answer the question as to whether the project had a beneficial effect on participating individuals, communities or providers compared with those who did not participate. The strength of this design depends on the extent to which it is possible to match the intervention and control groups on key factors that can influence the outcome of interest. In practice, it is extremely difficult to identify all possible factors that might influence outcomes in order to successfully match groups. Hence such designs require collecting data on possible confounding factors and possibly also more dependent variables to ensure consistency in findings — activities that require larger sample sizes and supplementary data collection efforts. Non-experimental and quasi-experimental designs also require more sophisticated analytical techniques to accurately evaluate impact.
- **Experimental designs** with randomized assignment of clusters that participate in the project is a third kind of evaluation design. The randomization presents a simple way to control for external factors that influence behaviors and health outcomes and the only design that can assign cause-and-effect conclusions. Randomized assignment implies that the evaluation must be considered in the development of the intervention itself; prior to program implementation. Eligible communities or providers have to be listed and randomized to determine who participates first. Randomization, however, not only represents a method for determining program impact with a high degree of confidence but it also presents a “fair” way to expand a large program.

Bryce J, Victora CG, Habicht JP, Black RE, Scherpbier RW; MCE-IMCI Technical Advisors. Programmatic pathways to child survival: results of a multi-country evaluation of Integrated Management of Childhood Illness. *Health Policy Plan.* 2005 Dec;20 Suppl 1:i5-i17. http://heapol.oxfordjournals.org/cgi/content/abstract/20/suppl_1/i5

Very practically, mapping out an intervention helps implementers and funders agree on a conceptual theory about the intervention — or how it is supposed to work. In the IMCI example, the mapping allowed for a clear picture of the expected outcomes and the pathways — and helped to identify why the intervention did not have a health impact. Mapping also helps to identify whether an impact evaluation is worthwhile, where variations in implementation might occur, and estimate the amount of time needed for change. In the case that the program had not been implemented sufficiently to improve the quality of medical care, for example, a full-scale evaluation of its impact on health would not be necessary.

Planning ahead: thinking about evaluation prospectively.

The manner in which a program is implemented will affect the design of its evaluation. Prospective evaluations are designed at the onset — at the same time that the intervention itself is being designed and implemented. Ex-post evaluations, on the other hand, are implemented at the completion of a project. Generally, it is more difficult to conduct a good quality impact evaluation ex-post, after an intervention has already been implemented.¹¹

An evaluation designed at the onset of a project has the best opportunity to reduce threats to validity — or the strength of the conclusions and inferences. When designing impact evaluations prospectively, it is possible to consider the operational aspects of

an intervention that affect the quality of the evaluation and the strength of its conclusions. These include targeting mechanisms (who is included and excluded in the intervention), whether the intervention is randomized to beneficiaries, and socioeconomic characteristics of beneficiaries that allow the findings to be generalized to other populations within country or across a number of different countries. Prospective impact evaluations can also be done in cooperation with program implementers, which increases the likelihood that results will be used in policy-making.

Matching the complexity of the design with the information needed to make decisions. There are different kinds of evaluation designs. The design of the evaluation depends on many factors, including data requirements, money, and time. Ultimately, however, the choice and complexity of an evaluation must be matched with the information needs and level of inference required to make decisions (see Box 5).¹⁰

Ensuring objectivity and independence. In the developing world, it is not uncommon that evaluations are conducted by institutes and individuals who have been involved in the design, implementation, or funding of a given intervention. This is probably related to a lack of human resources, limited numbers of domestic research institutes, and the need to involve people with in-depth knowledge of a given context. The results of even the most rigorous evaluation, however, may be questioned where evaluators are not perceived as objective and independent. Ways to address this problem include identifying and declaring conflicts of interest for evaluators, strengthening capacity for evaluation in more research institutes, and creating an external technical review process. ■

The “way forward”: strengthening impact evaluation to inform health system strengthening

Factors operating in the institutional and political environment can present obstacles to conducting evaluations and utilizing the findings of impact evaluations in allocating resources. Impact evaluations may not be in the political interests of government or donors, particularly where data is infrequently used for decision-making and fund allocation. They also take time – perhaps more time than is available in a typical planning cycle.

In addition, individuals who promote or carry out an intervention might do so because they are convinced of its effectiveness – and see no need for evaluation. Among donors as well as health managers, many are confident that they already know what is effective –based on their own personal experiences or professional training – despite few actual evaluations of health system interventions.

At a programmatic level, health managers are under pressure to demonstrate positive outcomes – which may result in placing programs where they know they will succeed. People with a financial or work-related interest in seeing that a program continues may resist evaluation for fear that it may reveal problems.



Evaluation may require publicizing information, and this could lead to political problems in some instances. Among health managers who want evaluation, some may face criticism for spending programmatic resources to conduct evaluations – and taking money away from implementation. Several concrete activities can be pursued to address these types of constraints, and promote evidence-based health systems strengthening interventions:

- **Look on evaluation as an investment** – in settings with limited resources, investing in evaluation needs to be justified – similar to an intervention. However, the cost of an

Impact evaluation of Mexico's conditional cash transfer program

The large-scale Mexican conditional cash transfer program, Progresa, was designed in 1997 during the Zedillo administration as a part of a poverty reduction agenda. The program's sustainability was a concern. In the past, it was common for each new administration in Mexico to establish its own social programs. Thus, the possibility of a change of administration in 2000 suggested that Progresa could be cut in a short period of time. To ensure the program's survival through political changes, it needed to demonstrate positive impact. What followed was a rigorous randomized controlled effectiveness evaluation of a large-scale social welfare program that set in motion important changes in the design of social policy in Mexico. The evidence of Progresa's positive impact on health, education, and nutrition was strong and contributed to the new administration's decision to expand rather than curtail the program. Moreover, after the external evaluation was released to the public, the Mexican Congress issued a law requiring social programs to carry out external evaluations of their impacts every year, preferably by external evaluators.

A number of other Latin American countries, including Colombia, Jamaica, Honduras, and Argentina, quickly followed suit – not only with conditional cash transfer programs like Progresa, but also the model of external evaluation. Given that such evaluations are public goods, the evaluations in many cases were financed by multilateral institutions

evaluation needs to be weighed against the potential gains achieved by modifying and improving programs, terminating programs that are poorly functioning, and preventing the implementation of large-scale programs for which the effectiveness is unknown.

- **Build evaluation into planning and resource allocation systems** – following the rigorous evaluation of the Mexican conditional cash transfer program, the Mexican congress mandated in 1999 external evaluations of all social programs. This mandate set in motion important changes to the design of social policy in Mexico from being driven by individual and political interests to being driven by data and evidence (See Box 6). Furthermore, substantial financial resources were dedicated to back the mandate, and the evaluation results were used in decisions about resource allocations. This provided incentives for program managers to design innovative but conceptually sound programs, which would be subject to an effectiveness evaluation to determine whether they merited expansion. The law and funding effectively built evaluation into the management, planning, and resource allocation processes for large-scale social welfare programs – and provided incentives for innovation and effectiveness.

Evaluation became an opportunity for learning or benefit, rather than a threat or judgment.

- **Secure global investment in evaluation as a public good** – the information gained from evaluation is a global public good because it informs policies and programs that can benefit populations that did not directly participate – both within the country of origin and in other countries facing similar constraints. The 2004 Mexico Ministerial Summit on Health Research urged higher spending on research and capacity building for research, amounting to at least 2 percent of a country's national health expenditures, and at least 5 percent of development aid agency project and program aid for the health sector.¹¹ Although global targets are debatable, higher levels of domestic and particularly international funding are justified given that evaluations can produce knowledge as a public good applicable across different settings. Recent efforts have been made at the global level to promote action across a number of agencies in establishing stronger common evaluation standards for public health programs.¹² Without enhanced global action to support evaluation it is likely that countries will continue to under-invest in impact evaluations.

■ Develop domestic capacity for evaluation research

— strengthening capacity to conduct evaluations in low- and middle-income settings requires money, technical expertise, time, and data. Technical capacity could be strengthened through ongoing exchange of technical materials and experiences through organizations such as the Alliance HPSR, stronger collaborations between research institutes, and open competitive calls for proposals with transparent technical review. While impact evaluation has global public good characteristics and needs to be conducted to high standards, the involvement and leadership of local researchers is critical in order for the study design to reflect local conditions, and for findings to be trusted and acted upon in-country.

■ Involve local decision makers in evaluation design and planning

— decision-maker involvement in the design of an evaluation can increase understanding of the rationale for study designs such as randomization, as well as the “believability” of the study’s findings among people who have the resources to put those findings into practice. Independence in evaluation is not sacrificed by ongoing engagement and communication with policy-makers — rather such engagement should increase the likelihood that the decisions will be used. In Mexico, decision-makers participated from the onset in the evaluation of the conditional cash transfer program, given that it was implemented alongside the program itself.

■ Implement what works while also testing innovations

— sometimes programs in international development are based on fads rather than evidence of impact. Some evidence exists however, and groups such as the Alliance HPSR are synthesizing existing evidence about the types of health system strengthening interventions that work, and under what conditions. International agencies such as WHO and the World Bank also play an important role in disseminating information about what really works in terms of health systems strengthening interventions as well as the limitations of the existing work. Efforts to strengthen health systems cannot be put on hold, until an appropriate evidence based is developed, but for innovative health systems strengthening interventions it is particularly important that evaluation is supported and evaluation might be made a program condition for external support to such interventions. ■

Conclusions

This brief presents the case for impact evaluations of health systems strengthening interventions to promote informed policies and investments. The knowledge base about the kinds of programs that are effective in strengthening health systems remains disturbingly weak and many lives are lost or scarred because of continued long-standing weaknesses in health systems in poor countries. While evidence will only ever be one among many factors affecting policy and decision making, much more can and should be done to strengthen the health systems evidence base.

Existing data collection systems rarely provide accurate information about programme impact and which strategies for health system strengthening should be expanded or ceased. It is important for program managers, decision-makers, and funders to think about impact evaluation prospectively while planning interventions, and choose an evaluation design that is matched to information needs and the required level of inference. Building evaluation into management and resource allocation systems, and increasing capacity for evaluation could promote evidence-informed health systems strengthening interventions over the long term. ■



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- 12 Center for Global Development. See http://www.cgdev.org/section/initiatives/_active/evalgap

The Alliance for Health Policy and Systems Research is an international collaboration, based within WHO, Geneva, aiming to promote the generation and use of health policy and systems research as a means to improve the health systems of developing countries. Specifically, the Alliance aims to:

- stimulate the generation and synthesis of policy-relevant health systems knowledge, encompassing evidence, tools and methods;
- promote the dissemination and use of health policy and systems knowledge to improve the performance of health systems;
- facilitate the development of capacity for the generation, dissemination and use of health policy and systems research knowledge among researchers, policy-makers and other stakeholders.

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