Implementation Science
Understanding and addressing complexity in public health programs

Many current challenges in maternal health are complex. For example, designing and implementing a functional emergency referral system might require creating effective communication channels among facilities, improving knowledge among health workers, establishing reliable transportation systems, ensuring healthcare staff do not request "informal fees" from patients, and changing deeply embedded community preferences about where to give birth. A comprehensive referral system would therefore need to be multi-faceted, and be designed to function in the context of a complex health system.

Randomized controlled trials and other quasi-experimental methods generate critically important evidence about many innovations, such as which drugs or intervention to use when a woman is referred for obstructed labor. However, these methods cannot provide all of the necessary information to implement comprehensive public health interventions in real-life settings. Implementation science can help to fill this gap.

Implementation science is the close study of implementation. It involves studying the process of introducing, institutionalizing, and sustaining policies, programs, and activities in complex settings. By their very nature, experimental methods fail to answer questions that may be decisive in shaping implementation. Experimental methods seek to control the context in which interventions are tried. However, when interventions are implemented, local political, social, programmatic, and cultural variables, such as the supply chain and the social class of providers and patients can be significant. In the domain of public health programming, experimental methods look for a correlation between an intervention and an outcome of interest; implementation science attempts to explain that link and deeply examine the execution process of an intervention.

The field of implementation science — which is still relatively new to the field of public health — offers multiple approaches to building the more detailed and specific (while still generalizable) evidence base needed to answer critical questions about how to promote equitable access to maternal healthcare. Implementation science can assess fidelity (e.g. was the program carried out as intended?), elucidate causal mechanisms, and identify contextual factors that may explain variation in outcomes. Contextual factors relevant to implementation can be specific to a public health project or more general, encompassing issues

Complex Adaptive Systems

Health systems are complex adaptive systems. Among other attributes, this means that relationships among components can be non-linear. As a result, interventions do not always have the intended effect.

such as health providers' attitudes, health system resources, public health activities carried out by other actors and programs, and national political changes. By addressing implementation fidelity, causality, and context, implementation science seeks to answer questions that can inform scale-up and sustainability.

AMDD'S Contribution to Implementation Science

Columbia University's Averting Maternal Death and Disability (AMDD) Program is committed to promoting equity and universal coverage. Achieving meaningful progress in these areas requires acknowledging and understanding deep, systemic problems that can undercut the best-laid programs and policies. For example, when the system for assigning healthcare posts and granting transfers to health workers and administrators is inconsistent or non-transparent, clinics can be left without key staff, which in turn foments apathy among workers and distrust among patients. Other examples of problems that might benefit from implementation science are the high, out-of-pocket costs that even the poorest must pay to access "free" services, or the disrespect and abuse directed at poor women while delivering their babies. Such dynamics ultimately shape the fate of evidence-based clinical interventions and globally-endorsed "best practices." To understand those dynamics, AMDD has undertaken a series of implementation research projects to extract broadly applicable implementation lessons.

Realist Evaluation

Within the field of implementation science, AMDD uses realist evaluation as a tool to understand what works, for whom, in what setting, and why. Realist evaluation uses the basic logic of "theory-driven inquiry" that is often used in the social sciences. Realist evaluation is premised on the insight that programs, which are efforts to introduce interventions

into a service delivery system, ultimately require individual actors—whether mothers, health providers, program managers, or government administrators—to make conscious decisions to change their behavior. A realist evaluation approach therefore begins by identifying the explicit or implicit theory of change that underlies each intervention. Recognizing that individual behavior is always embedded in a larger context, realist evaluations then use qualitative methods to test and refine these program theories by exploring the complex interaction among context, mechanisms, and outcomes. The evaluations offer lessons about how particular conditions interact with program mechanisms to generate outcomes.

AMDD has utilized the realist evaluation approach to understand the maternal, newborn and child health "Manoshi" program, which is operated by the international nongovernmental organization, BRAC, in urban slums of Bangladesh. The evaluation revealed several core elements that accounted for Manoshi's success in urban Bangladesh. One of these elements was BRAC's intentional creation of "linking social capital," or "norms of respect and networks of trusting relationships" between people with different levels of power in society.

BRAC recognized that for women in rural Bangladesh, childbirth was traditionally managed by pregnant women and their close networks of female family and friends, based in their village homes. But young women who had left the village for crowded slums were detached from these traditional networks, without the money (or sometimes the desire) to return to their villages to give birth. Moreover, in the context of the urban slum, women faced a new set of challenges that they were ill-equipped to overcome. When pregnant women tried to access public health services, they were diverted by brokers trying to push them to use private facilities, and/or asked to pay for care that should be free.

In response, BRAC's program activities – including community health workers, birthing centers, and a mobile-phone enabled referral network – created linking social capital for pregnant women. BRAC provided support to slum dwellers so they could access, with reduced exploitation, the resources of the city (including sophisticated health care) that otherwise lay beyond their reach. Beyond the direct impact on maternal health, Manoshi helped the slum dwellers to realize their aspirations of creating "new lives" in the city, to benefit from the resources of urban Bangladesh, and to improve the health and wellbeing of themselves and their families. Implementation science shed light on which project activities were essential, how BRAC created social capital that was responsive to the context, and how this capital spurred behavior change among health providers and pregnant women.

In another realist evaluation, AMDD worked in partnership with the BRAC School of Public Health and the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) to conduct a review of UNICEF's three major rural maternal and newborn health programs in Bangladesh. The research identified key program drivers and bottlenecks, as well as overarching lessons for implementation.

Among the overarching lessons, AMDD and partners found that "implementation support" and "implementation assessment" are indispensable and often ignored health system functions. Implementation support ensures health practitioners and administrators have access to knowledgeable support teams to help make the needed shifts in individual and organizational structures within the healthcare setting. Implementation assessment is the continual process of generating and analyzing data from the field that can feed into policymaking and implementation processes. It also involves helping decision-makers and managers understand ongoing efforts to introduce change in the system, to problem-solve at the local level, and to ensure that the system ultimately delivers as intended. Variation in implementation support and assessment, in conjunction with contextual differences across rural Bangladesh, explained some of the variation in program outcomes. In this case, the multiplicity of activity-specific findings were synthesized to generate broader lessons about implementation.

AMDD's experience in implementation science, including the realist evaluations of BRAC and UNICEF programs, has shown that even when a health program is designed and implemented to focus only on biological health outcomes, its actual functioning in the lives of its stakeholders (clients, providers, and policymakers) is always a far more complex affair. Implementation science can capture some of this complexity, providing insights to be harnessed for improving the program researched, scaling up, and addressing similar maternal health challenges in different settings.

Notes

[1]Moore, G. et al. (2013). Process evaluation in complex public health intervention studies: the need for guidance. Journal of Epidemiology and Community Health.

[2]Pawson, R. and Tilley, N. Realistic Evaluation. London: Sage, 2006.

[3]Szreter, S. and Woolcock, M. (2004). Health by association? Social capital, social theory, and the political economy of public health. International Journal of Epidemiology. 33(4):650-667.