

Integrated health system strengthening can generate rapid population impacts that can be replicated: lessons from Rwanda to Madagascar

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At the turn of the century, the Millennium Development Goals (MDGs) set targets to dramatically improve human welfare by 2015. These ambitious aims included reducing extreme poverty by 50%, under-5 mortality by 66% and maternal mortality by 75%, and were accompanied by international support. Now, most African countries have international funding and policy commitments to treat HIV, tuberculosis (TB) and malaria, provide contraceptives to women, vaccines for children, and implement WHO-recommended treatment guidelines for maternal and child health, supported by front-line community health workers (CHWs).

Why then, if the treatments are known, affordable at scale and supported by standard policies, did only a few countries achieve their health-related MDGs and what does that mean for the prospects of the Sustainable Development Goals? One answer is that even simple technologies require complex delivery systems—a value chain of staff, stuff, systems and space—to align at the point of care and serve each individual patient. The recognition of this challenge has led to a growing movement towards health system strengthening (HSS) based on WHO's six building blocks—personnel, supplies, finance, leadership, services and information systems.

Those who see the global health challenge primarily through the lens of scale—including policymakers, international stakeholders and social ventures—point out that the HSS building blocks do not actually guide implementers, as they consist of many dimensions that are difficult to prescribe.¹ The result is an enduring tendency for the international community to invest in uncoordinated vertical efforts, often undermined by challenges with integration into local health systems that are unable to adequately support them.^{2,3} Such

vertical approaches can be easily measured through process indicators (such as quantity of services delivered), but rarely demonstrate population-level impacts such as on coverage or mortality rates.⁴

In contrast, an alternative paradigm is to integrate HSS initiatives with clinical programmes at multiple levels of the system within a geographically targeted unit. While these have traditionally lacked a strong evidence base, two recent papers in *BMJ Global Health* show that rapid and rigorously evaluated population-level impacts can result from HSS in different political and economic contexts.^{5,6}

In 2005, when the non-governmental organisation (NGO), Partners In Health (PIH), began working in Eastern Rwanda, the country was recovering from the 1994 genocide, when as many as a million people were killed. In the catchment area of Southern Kayonza and Kirehe districts, there was no hospital for a population of 400 000 people. Under-5 mortality rate was 230/1000. Patients needing life-saving medicine had as few options as those in rural Madagascar a decade later. In coordination with Rwanda's national policies, including its Vision 2020 (established in 2007), PIH and the Government of Rwanda rapidly strengthened an integrated local health system by constructing and staffing hospitals, supporting health centres and equipping a network of CHWs that provided maternal and child health, TB and HIV care.

Rwanda has since become among the world's top performers on the health-related MDGs, and a leader in health system transformation.^{7,8} Macroeconomic drivers are clearly a factor. After the genocide, Rwanda experienced a virtuous cycle of political stability, international investment and foreign aid.⁹



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Corruption perception and Doing Business rankings rose to among the highest in sub-Saharan Africa.^{9–11} Gross domestic product growth became among the top 10 in the world. Meanwhile, the president, a former military general, invested in and enforced aggressive health policies, including requiring all citizens to purchase health insurance.⁸

International partnerships, such as with PIH (which was the largest health NGO in Rwanda), were an inextricable part of this progress. For both sovereignty and efficiency, these partnerships were managed centrally on terms largely defined by the Rwanda government. To understand the impacts of the HSS initiative in Rwanda, Thomson *et al*⁵ analysed cross-sectional household-level Demographic and Health Survey (DHS) data in 2005 and 2010, within the PIH catchment area in comparison with the rest of rural Rwanda. The results show rapid improvements in population health at a subnational level: under-5 mortality dropped by 64% in 5 years; this is equivalent to an annual decrease of 12.8%, which was substantially faster than the rest of rural Rwanda and triple the rate needed to meet the MDGs. But is that replicable?

In 2014, a collaboration between the NGO PIVOT and the government of Madagascar started a district-level model health system for the country based on transferring lessons primarily from PIH-Rwanda.⁶ As in Rwanda, the Madagascar initiative focused on the implementation of national policies at all levels of a district health system (community, health centres and hospital) to ensure a continuum of care for all patients. This included both improved readiness (such as infrastructure, staffing, training and supply chain) at each level of the system, and integrating clinical programmes, such as maternal and child health. The data systems that were ultimately retrofitted in PIH-Rwanda were improved and more carefully integrated at the outset in Madagascar.

A longitudinal cohort of a representative sample of households within and outside of the initial PIVOT catchment relied on the same instruments and field teams as the national DHS, with similar results as in Rwanda: under-5 and neonatal mortality in the PIVOT catchment area dropped by nearly 20% and 36% in the first 2 years (twice the rates required to meet the MDGs). Deliveries in health facilities increased by 63%. In Madagascar as in Rwanda, per capita costs were between US\$25 and US\$35 annually.

The power of these results rests partly in the similarities at baseline between the study areas in Rwanda and Madagascar. Both countries were francophone with largely subsistence agricultural economies. Per capita income in 2005 in Rwanda was US\$430, and Madagascar in 2014 it was US\$408 (comparison done in year 2000 dollars). Under-5 mortality in Ifanadiana district in 2014 (where PIVOT started) was 145/1000, and in rural Rwanda it was 158/1000 in 2005. But while Rwanda has been a top economic performer over the past two decades, Madagascar has been in economic stagnation or decline. Unlike Rwanda, whose government has become

immutable, Madagascar's government suffered another coup d'état as recently as 2009, with high government turnover and a high perception of corruption.¹² Yet, despite the different political and economic contexts, the interventions generated similar results.

The results of the Rwanda study tell a story of convergence in rapid improvements between intervention (PIH catchment area) and comparison sites (rest of rural Rwanda, which itself was changing fast) over 5 years. In contrast, in Madagascar, where the PIVOT intervention was still nascent after 2 years with many programmes yet to be fully implemented, there was divergence between intervention and comparison sites (ie, the intervention area had clear improvements over the rest of the district).

While the specific process for strengthening a local health system must be adapted to the context, the core strategies presented here are based on common principles: (1) working within the public system in partnership with governments and communities; (2) addressing all building blocks of HSS to improve horizontal readiness and integrating clinical services anchored in primary care; (3) investing in capacity building throughout the system; (4) ensuring data systems that allow for impact evaluation, information loops and research with academic partners; and (5) a long-term commitment to strengthening a public system whose needs will evolve over time.

Governments and international stakeholders are still asking whether universal health coverage through community-based HSS can be replicated. In fact, such replication is occurring widely around the world. This includes PIH sites in Malawi, Mexico, Peru, Haiti and elsewhere. Essential elements have also been adapted and expanded by like-minded field-based organizations in collaboration with committed national governments in Mali (Musso), Togo (Integrate Health), Nepal (Possible), Liberia (Last Mile Health) and Kenya (Lwala).¹³ In peri-urban Mali, drops in under-5 mortality rates were especially rapid¹⁴ with results that are broadly consistent with recent evidence of health outcomes from the Millennium Villages Project.¹⁵

The evidence is now clear that the health-related SDGs can be accomplished through interventions that are integrated locally. The important questions now have to do with the process of implementation and how to best scale from the local to the national level. It is time to stop asking whether or not these initiatives can be replicated. With improved data systems that are integrated locally and amplify the evidence internationally, let us instead invest in finding the answers to how to scale them faster.

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