Health Information Systems
From Evidence to Action

Equitable health policies demand timely and reliable evidence on what is needed, what works, and who is being left out. A combination of research and training supported by IDRC is strengthening health information systems in low- and middle-income countries to meet peoples' real health needs.

In equitable health systems, health resources match what people need, with prevention and treatment focused on the local burden of disease and serving those at greatest risk. Yet healthcare planners in many low- and middle-income countries lack information systems that effectively support decision-making. They lack the tools, framework, skilled staff — and often the leadership and vision — to properly gather and interpret data, and apply the resulting evidence to health needs.

Many factors undermine the use of information. Data may be fragmented, as when different units within a health system maintain their own databases, or when external aid drives separate reporting systems. Countries may lack the technology and expertise to process and share information in ways that connect health users, planners, and providers. And when data is captured mainly in clinics and hospitals, there may be biases and gaps because certain groups — often the poorest and the marginalized — cannot access these facilities, and go

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Health information systems are a foundation for quality care, and can increase accountability between healthcare planners, providers, and users.

"uncounted." At worst, a dysfunctional health information system can mean peoples' basic needs are unmet.

Reducing silos and ensuring community input

Through its Governance and Equity in Health Systems (GEHS) program, IDRC invests in research and training to help low- and middle-income countries strengthen their health information systems. The aim is to bridge the gaps between communities and those who make decisions on health policies and services.

GEHS supports efforts that reach beyond healthcare institutions to capture evidence at the community

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Neil Andersson, Executive Director of CIET, leads several major components of the Nigeria Evidence-based Health System Initiative.

and household level. In doing so, researchers work alongside health sector workers and decision-makers to strengthen state capacity to produce and apply scientifically grounded evidence. They empower communities to play a foundational role in shaping and monitoring their own health systems. And through GEHS, technological innovation is supported not as a quick fix, but as a means to collect quality data, integrate data systems, and increase accountability.

Using evidence to reduce maternal deaths in Nigeria

In 2010, some 40,000 Nigerian women died in childbirth — 14% of the world's total maternal deaths. In many rural areas, women and girls marry young and put in long hours of grueling domestic labour — grinding meal, fetching firewood and water, tilling and selling crops — well into late stages of pregnancy.

After two years of extensive consultation, the Nigeria Evidence-based Health System Initiative (NEHSI) was launched in 2008 as a joint effort of the Government of Nigeria, IDRC, and the Canadian International Development Agency. It strengthens health information systems in two Nigerian states — Bauchi and Cross River — and trains decision-makers to use local evidence in planning and managing health

services. Improving maternal and child health outcomes is a top priority.

The initiative uses a social audit and implementation research methodology: it gathers input from multiple stakeholders, then rolls out and monitors the effectiveness of evidence-based health responses over time. According to Neil Andersson of the research and training organization CIET, this serves as a reality check: a social audit takes stock "of where we are with our assumptions, guesses, and intentions. The idea is to produce hard evidence about what works, who is left out, and what will make up the shortfall."

NEHSI weaves together many strands of capacity strengthening to build the confidence, skills, and expertise of health decision-makers. In Giade, a local government area in Bauchi state, skilled attendants assist less than 15% of births. The NEHSI team implemented a community surveillance system at the request of local officials. Household monitoring visits are structured to identify pregnant women and newborns at risk. Community health extension workers interview pregnant women and, separately, their husbands. Over a series of visits, the workers discuss maternal and child health needs, using findings from an earlier baseline study as a starting point.

With smartphones that confirm geographic location, they capture responses to a short list of questions, and relay them directly to headquarters in the state capital. This identifies high risk cases in real time, allowing for immediate follow up. The information can also be shared with health centres and collated for planning and policy purposes.

Results so far suggest that visiting women in their homes to discuss pregnancy may be an inexpensive way to save women's lives. In 8,000 households in Giade, maternal deaths were 3.8 % among those who received one visit, 0.8% among those who received two, with no deaths recorded among those who received three home visits.

Beyond its impact on maternal health, NEHSI is changing the way the health system works. When it ends in 2014, the project will have laid the ground-

Using technology, NEHSI brings vital health information to the doorsteps of Nigerian families. Here, a health extension worker captures and relays information on the health of a mother and her infant. With an inexpensive smartphone, she can identify high risk cases for immediate follow up. The device also pinpoints her location.

work for scaling up an evidence-based model for decision-making in Nigeria. The research has shown that informing and involving communities can directly improve health outcomes. By working with local and state government partners, it ensures the tools and training leave a legacy of institutional capacity.

Integrating ICTs within health systems

In building a culture of evidence-based planning, NEHSI has integrated information and communication technologies (ICTs) to help improve service delivery, build local capacity for primary health care, and address the challenges of rural isolation. But for too long, ICT and health system researchers have worked in isolation from one another. There is limited evidence on how electronic health (eHealth) technologies can be used to enable the governance and functioning of health systems in low-income countries. Starting with the gaps in the health system — rather than the technology — there is a need to better understand how these tools can strengthen service provision and use, support decision-making, contribute to fair resource allocation, and increase responsiveness to user needs.

IDRC is working to fill this gap through SEARCH (Strengthening Equity through Applied Research Capacity building in eHealth), a multi-regional initiative that seeks to build knowledge on the integration of ICTs with health systems in Africa, Asia, Latin America, and the Caribbean. SEARCH is devoting CA$2.5 million over 3 years to a series of research and training grants. It aims to deepen understanding of the relationship between eHealth, equity, governance, and systems integration

Through the SEARCH initiative, IDRC is expanding research on the integration of ICTs with health system strengthening.

and build research capacity through networking, training, and communications.

SEARCH builds on a large body of eHealth research supported by IDRC that has contributed to health information systems. In Mozambique, for example, through the M-OASIS (Mozambican Open Architecture Standards and Information Systems) project, researchers worked with the national Ministry of Health to design an electronic mortality registration system. Tested in Maputo's central hospital, it codes causes of death using ICD-10, the current international standard for classifying disease. It produced the first systematic data collected routinely in Mozambican hospitals, and has since been approved for roll out across the country.

Technological innovations such as this are just one component of strong health information systems. They depend ultimately on fostering the leadership and technical skills to make decisions based on evidence, applying rigorous data collection and analysis

methods, and involving healthcare providers and users. Supporting social participation and enhancing local capacity are vital.

Empowering communities through health system monitoring in Guatemala

Despite its middle-income status, Guatemala has some of the worst health outcomes in Latin America with more than half of its population living in poverty. Indigenous populations in rural areas, who suffered the most during 36 years of civil war, have gained little from recent social reforms.

To give these indigenous communities more input on decisions affecting their health services, a team of researchers, policymakers, and civil society organizations led by Centro de Estudios para la Equidad y Gobernanza en los Sistemas de Salud designed and field tested a participatory health monitoring system in six rural municipalities. Developed between 2006 and 2010, the system has helped to change local power dynamics. National authorities

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> Research leader Walter Flores is the director of Centro de Estudios para la Equidad y Gobernanza en Sistemas de Salud in Guatemala.

and civil society organizations are now looking to apply its lessons in other municipalities.

"One of the main barriers (to reform)," says research leader Walter Flores, "is the hierarchies within the health system. There are deep hierarchies between those at the centre versus those working at the rural level. But the greatest hierarchy is between public officials and ordinary citizens."

To address the lack of trust between citizens and health authorities, the monitoring system was guided by a multistakeholder steering committee, which included health workers and representatives from municipal government and community organizations. They worked together to evaluate healthcare facilities and families' experiences with them.

Information was collected and analyzed four times a year, and the committee reported to the municipal development commission. Out of their discussions, action plans were developed. The steering committee then monitored whether decisions were carried out. Findings fed into successive cycles of assessment and fine tuning to ensure this joint action was improving equity and accountability.

In Guatemala, communities gained better healthcare access and services by monitoring public health policies. Youth leaders were among those actively involved.

In all six municipalities, the monitoring and advocacy initiatives achieved concrete improvements, such as the dismissal of subcontracted healthcare providers for poor performance and corruption; municipal coverage of ambulance fuel costs; improved water services for a district hospital; fewer absentee healthcare workers; and more follow up on complaints about discrimination.

For Walter Flores, one of the key lessons is the value of linking citizens and public authorities: "This type of trust is very important to rebuild the social fabric and strengthen democratic practices."

As these results show, strengthening health information systems — and the capacities of those who run and use them — can strengthen democracy by making relevant data available and transparent to decision-makers and citizens alike. In this way, the systems provide accountability for both the state and the household. With a solid evidence base, and greater input from citizens, the health services delivered and used are more likely to reflect real needs.

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