The people of Swaziland—a small, landlocked nation in southern Africa—have among the worst life expectancy measures in the world, a result of the twin epidemics of HIV and tuberculosis. While much has been done to confront HIV among pregnant Swazi women, fully 41 percent have the retrovirus. And while high-quality HIV health services and evidence-based treatments are widely accessible at primary healthcare facilities in Swaziland, it remains difficult for women and their families to remain in long-term treatment.

Such conundrums exist throughout the field of public health, says Wafaa El-Sadr, MD, MPH, professor of Epidemiology and founding director of ICAP, the Mailman School’s global health center. “We have a lot of evidence about what works,” she says, “but there is a gap between the research findings and the ultimate health outcomes we want to achieve.”

El-Sadr is a leader among a cadre of scholars intent on identifying the most effective means for translating public health evidence into practice. Working around the globe with their in-country partners, such researchers are developing packages of interventions to support long-term care...
for people with HIV; documenting, testing, and comparing the effectiveness of tactics to improve health outcomes; and creating programs designed for resource-constrained settings. In the process, they’re piloting and scaling up evidence-based approaches to public health promotion that can be tailored to reflect local customs, cultures, and resources.

Not to be confused with the implementation of programs, implementation science—an approach that El-Sadr has championed in the U.S. and abroad—tests methods for spurring the uptake, implementation, and translation of research findings into routine and common practice. In Swaziland, for example, ICAP is testing the best methods for linking people with HIV to ongoing care and helping them to stick with it. Among the approaches under investigation are additional testing to estimate the risk of complicating infections, accelerated initiation of HIV treatment, appointment reminders sent via mobile phones, provision of care and prevention items like condoms, and noncash financial incentives to cover the cost of travel to clinics.

### Implementation Science Tests Methods for Improving the Uptake, Implementation, and Translation of Research Findings Into Routine and Common Practice.

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### A Legal Framework

The challenge of bridging the gap between public health scholarship and health outcomes often boils down to a single question, says Sara Abiola, PhD, JD, assistant professor of Health Policy and Management: “How do you change the environment so that people can engage in healthy behaviors?” A Harvard-trained lawyer with a doctorate in health policy, Abiola investigates how legislative interventions can help prevent chronic, noncommunicable diseases—especially those related to food, alcohol, and tobacco—around the world.

The key to success, she says, is a coherent policy package that promotes synergy. Consider childhood-obesity prevention, she suggests. Physical education classes in grade schools have been shown to boost fitness. But if a state fails to also promote access to healthy foods in school cafeterias, its legislation regarding gym classes will have a limited impact on childhood obesity. To identify effective approaches to public health legislation worldwide, Abiola and her team are compiling a comparative database of legislation and policy from Brazil, India, Kenya, Mexico, South Africa, and the U.S. “Our

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Legal scholar Sara Abiola (left) investigates how legislation and policy can transform the human environment to promote or protect public health. A current project catalogs differences among WHO member nations in policies to regulate cigarette sales (right), reduce exposure to secondhand smoke, and increase awareness of the dangers of tobacco.

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Photos, left page courtesy of ICAP; this page, top left by Martin Seck; top right by iStock/anouchka
goal,” she says, “is to optimize packages of evidence-based policies that positively influence public health outcomes.”

Using a quantitative scoring system developed in her own research group, Abiola and her team rate each country’s response to a number of public health challenges. The team’s tobacco index, for example, rates seven categories linked to the leading cause of preventable deaths worldwide—such considerations as how tobacco sales are administered and what consumer warnings are legally mandated. As the subject of a binding treatise from the World Health Organization, which requires member nations to take specific action to address smoking, tobacco has been the subject of an array of legislative efforts to boost awareness, restrict availability, and promote access to programs that can help citizens kick their addiction. But not all legislation is created equal, as Abiola and her team are documenting.

As a proxy for exposure to secondhand smoke, for example, the team has scored restrictions on indoor smoking. The researchers award a high score if a nation prohibits smoking in many locations, and “partial credit” if smoking is only prohibited in a few venues. “We’re marrying legal data with epidemiological data to create an accurate measurement,” says Abiola. “The index itself incorporates evidence around policies that are expected to work.”

The team also weighs aspects of the cultural context in which those policies exist. In Moldova, for example, local and regional governments rely heavily on revenue generated by the wine industry. “That’s an important factor to consider when trying to regulate and reduce alcohol use,” says Abiola. “The conversation has to be nuanced.”

**SYSTEMS THINKING**

A child with pneumonia struggles to breathe. Her nostrils flare, her lips develop a blue tinge. What happens next in this frightening emergency scenario depends on the healthcare setting and the available resources. At a university hospital, a physician specialist might insert a tube into the child’s trachea and connect it to a mechanical ventilator; at a community clinic, a nurse might give the child antibiotics and refer her to a higher level of care.

In the absence of adequate treatment, pneumonia claims the lives of more than 2 million children under the age of 5 every year. Associate Professor of Emergency Medicine and of Population and Family Health Rachel Moresky, MD, MPH, had a theory that—in the absence of expensive high-tech equipment and specialists to operate it—a simpler, cheaper intervention, performed by trained nurses, could save lives. To prove her theory, Moresky and her colleagues in Ghana studied the training of nurses at first-level hospitals in rural parts of the country on how to use continuous positive airway pressure (CPAP) therapy to relieve respiratory distress in children under 5 years of age.

The research, developed in Ghana and scaled as a training program in Cambodia,
Honduras, Kenya, and Rwanda, is “task sharing with supportive supervision,” says Moresky. Many lifesaving interventions are reserved for highly trained specialists, she notes. But when such tasks are shared by healthcare workers in conjunction with supportive supervision, she says, more lives can be saved at facilities closer to a patient’s community.

The CPAP program is part of a much larger effort by Moresky, who founded and directs Systems Improvement at District Hospitals and Regional Training of Emergency Care (sidHARTE), a program for strengthening emergency systems. Since 2008, sidHARTE has partnered with universities, governments, and local stakeholders to provide high-quality, resource-appropriate acute care through technical assistance, implementation support and science, training, capacity building, and policy innovation.

“To make improvements to healthcare systems,” she says, “stakeholders need to use evidence to determine exactly how to integrate acute care.”

In partnership with the governments of Ghana and Rwanda, sidHARTE has built an acute care toolkit with assessment, training, and clinical guidelines, as well as policy development notes; the Rwanda toolkit is available on the WHO website. In June, Moresky and the sidHARTE team returned to the Upper East Region of Ghana with representatives from the nation’s Health Service to develop ways for facilities and districts to collect data they can use to make their own evidence-based improvements. Strategic planning across agencies is key, she says. “The corresponding investments in infrastructure, human resources, and outcomes research for acute care systems are considerably underfunded,” she says, “and as a result, lives are needlessly lost that could be saved with rapid, resource-appropriate interventions that are better integrated with primary and chronic care systems.”

Whether analyzing legal frameworks, enhancing healthcare delivery, or identifying optimal methods for program implementation and expansion, public health scholars must work within existing health systems. Like Moresky’s sidHARTE, which has long-standing collaborations with local partners, El-Sadr’s ICAP ensures full ownership of the programs and research by in-country stakeholders. Scientists must also identify meaningful data points that are easy to collect, says El-Sadr, and use rigorous analytical methods to assess how best to deliver evidence-based practices and scale them up effectively.

“Public health includes a spectrum of research, programming, training, and implementation science, and every part is important,” she says. “We want to inspire and motivate the next generation of researchers and those who take knowledge to action.”

Health and environment reporter ALISON FROMME contributed to The Science Writers’ Handbook.

Photos courtesy of sidHARTE.