

## Closing gaps in protection against influenza

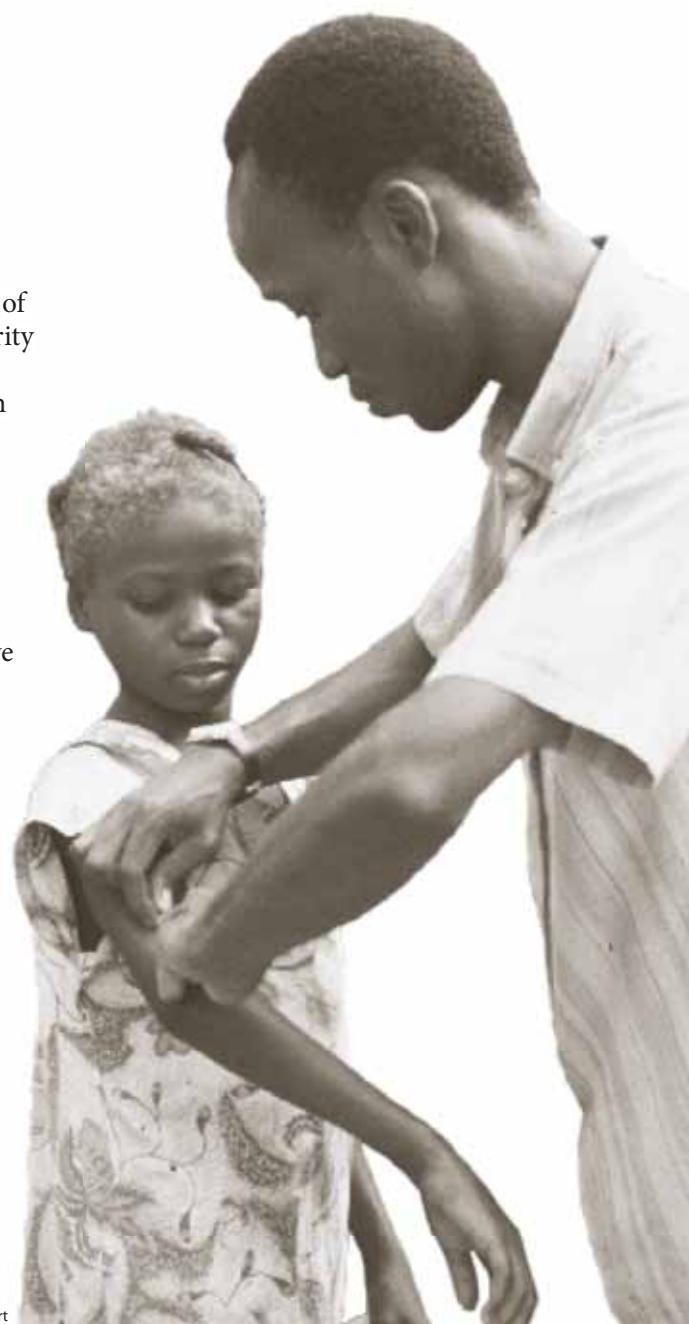
A strategy to create effective vaccine solutions for Africa and beyond

Each year, influenza causes up to 500,000 deaths and 5 million cases of severe illness worldwide.<sup>1</sup> Although it is too early to predict the severity of the current influenza A(H1N1) pandemic, public health leaders worry that a highly virulent pandemic strain could lead to more than 60 million deaths in today's highly interconnected world, mostly in developing countries.<sup>2</sup>

Exacerbating the risk is a lack of knowledge about patterns of influenza in tropical regions, including sub-Saharan Africa. The absence of reliable surveillance data in those areas makes it difficult for public health officials to develop optimal control strategies and could delay pandemic response time. Furthermore, although effective vaccines have been available on the global market for decades to prevent seasonal influenza in temperate zones, they have not been well studied or used extensively in tropical, low-resource countries where influenza viruses may circulate year-round.

As part of a multifaceted approach against influenza, PATH and our partners recently launched an influenza vaccine field trial in Senegal to answer questions about the influenza burden in tropical Africa and about the effectiveness of seasonal influenza vaccines in this setting. The study is the largest influenza vaccine trial ever undertaken in Africa and complements PATH's efforts to develop new influenza vaccines for low-resource countries. It is also a good example of how PATH works to meet complex health needs in Africa, where we now have 13 offices coordinating projects in 26 countries. (See the back cover for map and additional information related to work in Africa and other regions.)

*Continued on page 10*



Molly Mort

## Health systems strengthening

**Project name**  
Scaling up the National Response to HIV/AIDS through Information and Services (SUNRISE)

**Location**  
Ukraine

**Methods**  
Behavior change communication, public-private partnerships, surveys, systems strengthening

**Partners**  
All-Ukrainian Network of People Living with HIV/AIDS, International HIV/AIDS Alliance

**Funder**  
US Agency for International Development

### For more information

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# Using new approaches to improve HIV/AIDS services

## Training and tools to strengthen health systems in Eastern Europe

**HIV IS SPREADING RAPIDLY IN UKRAINE.** The incidence of infection has more than doubled since 2001, and an estimated 440,000 Ukrainians are now living with HIV.<sup>1</sup> Because the epidemic has spread in the general population and especially among young adults, HIV poses a serious threat to the country's economic well-being. Making matters worse are poor public knowledge about HIV transmission and limited resources for treatment.<sup>2</sup>

PATH is working with our partners in Ukraine to slow the spread of HIV by enhancing prevention and support services and improving access to high-quality care and information. Our interventions target populations most at risk, including injection drug users and sex workers, in 28 cities of eight oblasts with the highest HIV prevalence. We are collaborating with local clinics, social service agencies, and other nongovernmental organizations (NGOs) to train providers in voluntary counseling and testing, and we are also partnering with pharmacists to enhance the role they play in delivering HIV/AIDS-related advice and referrals to clients. This work is typical of PATH's work in Eastern Europe, which has focused on strengthening health systems (see sidebar on page 3).

### Developing a unique training approach

To better understand the challenges facing HIV/AIDS service providers

in Ukraine, PATH surveyed 893 staff from HIV/AIDS centers, drug rehabilitation and sexually transmitted infection (STI) clinics, and NGOs about their knowledge, attitudes, and practices. The findings pointed to gaps in providers' understanding of basic information, such as modes of HIV transmission, and in their counseling skills, and it revealed a need for improving attitudes toward voluntary counseling and testing (VCT).

Using results of the assessment, PATH has developed a unique approach to train a range of target audiences in VCT services and to promote these services among vulnerable populations. We bring together representatives of medical facilities, local organizations, and people living with HIV/AIDS for concurrent training to enhance cooperation and referrals among the groups. The combined trainings allow participants to discuss VCT from multiple viewpoints and reduce stigma and discrimination. To further expand access to VCT services, we have developed a network of 50 master trainers representing both medical and social service providers.

To date, PATH has trained nearly 1,500 people on VCT, expanding HIV/AIDS services to 50,000 people. The PATH team has also developed printed aids, booklets, and leaflets to give providers more resources for helping their clients obtain high-quality care and support information.

## Pharmacies as service centers

In Ukraine, as in many countries, pharmacies are often the first—and sometimes only—stop for people seeking health care advice, products, services, and referrals. This is especially true for injection drug users, sex workers, and other people engaging in high-risk behaviors. Although pharmacy staff in some countries play a major role in providing information about STI and HIV prevention and treatment and can be an excellent source of referrals to VCT services, a baseline assessment in Ukraine showed that pharmacists often did not have the knowledge or skills to refer clients to nearby services or offer effective counseling and information.

In 2006, PATH launched a pilot project to strengthen pharmacists' roles in STI and HIV prevention. Drawing on our experience engaging pharmacy workers across the globe, PATH focused on state-run pharmacies in three cities. We trained about 200 pharmacists to effectively counsel high-risk clients and provide them with information and services, and 22 pharmacies distributed more than 500,000 pieces of educational material prepared by PATH. PATH staff also used mystery client visits to present real-life scenarios—such as a woman potentially exposed to HIV through unprotected sex—and to evaluate pharmacists' responses.

The team also established a system for referrals to AIDS centers, STI clinics, syringe exchange programs, and other organizations that offer HIV services. Monitoring of clients from five pharmacies in the city of Kryvyi Rih found that 144 clients had subsequently sought testing at an HIV center or STI clinic.

Overall, the intervention improved pharmacists' ability to help clients and demonstrated that providing basic counseling is feasible for Ukrainian pharmacies. Most

significantly, pharmacy workers trained by PATH were more likely to provide clients with written information about STI and HIV testing, and pharmacists were more able to accurately direct clients to HIV centers and other services. The

intervention, however, did not improve pharmacists' ability and willingness to orally provide information about STIs and the use of condoms—a shortcoming that PATH has discovered in similar interventions in other countries.

## Solutions for the future

High-risk populations in our intervention sites in Ukraine now have better access to VCT services and information to help slow the

PATH / Mike Wang



PATH has partnered with pharmacies in Ukraine to prevent transmission of sexually transmitted infections and HIV.

spread of HIV. Scaling up our approaches to reach even more cities and oblasts will further strengthen health systems in Ukraine and help to protect additional communities across the country. ■

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## Strengthening health systems throughout Eastern Europe

Since the mid-1990s, PATH has tackled a number of pressing health issues in Eastern Europe:

- **HIV and AIDS.** Implemented system changes to increase condom use and enhance peer-support programs, helped the government procure supplies, reduced mother-to-child transmission of HIV, and helped hospitals reduce exposure to bloodborne pathogens.
- **Tuberculosis.** Enhanced disease surveillance, laboratory capabilities, health policies, and provider education.
- **Women's health.** Improved breast cancer detection, treatment, and rehabilitation; increased women's access to emergency contraception.
- **Vaccines and immunization.** Assisted local governments in updating health information systems; helped improve systems to immunize children against hepatitis B and procure diphtheria toxoid vaccine for adults.
- **Avian influenza.** Strengthened preparedness to respond to a potential pandemic.

## Vaccine manufacturing and introduction

<b>Project name</b>
Japanese Encephalitis Project
<b>Location</b>
Asia and the Pacific
<b>Methods</b>
Advocacy, public-private partnerships, surveillance, technical assistance, vaccine development and introduction
<b>Partners</b>
Chengdu Institute of Biological Products, International Vaccine Institute, ministries of health, UNICEF, US Centers for Disease Control and Prevention, World Health Organization
<b>Funder</b>
Bill & Melinda Gates Foundation

### For more information

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 Visit [www.path.org/projects/japanese\\_encephalitis\\_project.php](http://www.path.org/projects/japanese_encephalitis_project.php) to learn more.

# Controlling Japanese encephalitis

**Project partners increase access to affordable vaccine in Asia**



PATH / Julie Jacobson

In India, 55 million children have recently received Japanese encephalitis vaccine.

FOR DECADES, VACCINES HAVE BEEN available to guard against Japanese encephalitis (JE), a leading cause of disease and disability in Asia. But when PATH's Japanese Encephalitis Project began in 2003, few people other than international travelers and Chinese children actually had access to them.

By facilitating collaboration among affected countries, public and private organizations, and a Chinese vaccine manufacturer, the project has brought affordable immunization against JE to millions of people at risk. Some 55 million children in India have recently received JE vaccine, and millions more will soon be protected. The project illustrates PATH's collaborative approach to improving health in Asia, where our work began more than 30 years ago.

### Defining needs and searching for solutions

About 3 billion people in Asia and the Western Pacific region are at risk for JE, which is caused by a mosquito-borne virus. Each year, the disease strikes an estimated 50,000 people, kills up to a third of them, and permanently disables one in three survivors.<sup>1</sup> Its main targets are children 1 to 15 years old. Because efforts to curtail the disease by controlling mosquito populations have proved ineffective, human vaccination is the only reliable tool for prevention and control.

Until recently, several countries—including India, Japan, South Korea, Thailand, and Vietnam—produced and used an inactivated-virus vaccine developed in the early 1940s. Although the vaccine was effective, it was expensive and unwieldy to manufacture and use.

Problems with vaccine affordability and supply coupled with lack of solid information about the extent of illness contributed to low vaccination rates in Asia.

PATH began addressing the problem by working with public and private organizations to set up surveillance systems and enhance diagnostic capacity. With access to crucial surveillance data, countries began to understand the extent of JE, prioritize its prevention, and focus on the regions and people that most need protection. PATH staff began to look for affordable and practical alternatives to the previously used vaccine.

### A "new" vaccine emerges

The project team found an alternative hiding in plain sight. Since 1988, Chinese children had been immunized with a vaccine called SA 14-14-2 that was made with live, attenuated virus. The vaccine had proved highly effective and inexpensive. A case-control study in Nepal found that with only a single dose, the vaccine was 96 percent effective after five years.<sup>2</sup> Moreover, 200 million children had already received the vaccine safely.

PATH subsequently formed a unique partnership with the vaccine's manufacturer, the Chengdu Institute of Biological Products. PATH and the state-owned firm collaboratively devised a strategy for increasing access to the SA 14-14-2 vaccine outside China. The partners established a maximum public-sector vaccine price, available until 2026 for countries with gross national incomes of less than US\$1,000 per capita. The partnership agreement allows countries with few public health resources to introduce the vaccine, and the manufacturer makes a modest market return.

Once market demand existed, the partners began to consider how to ensure a sufficient, stable, and affordable vaccine supply. In July 2007, construction began on a new Chinese manufacturing facility supported in part by PATH. Despite delays caused by a devastating earthquake that struck Sichuan Province in May 2008, the facility is nearing completion.

### Maintaining momentum

The number of children in India vaccinated against JE will grow as the country continues mass vaccination campaigns and adds the vaccine to its routine immunization program. Cambodia plans to launch a JE vaccination program later this year, and Vietnam has announced it will expand its previously limited vaccination program to cover children across the country.

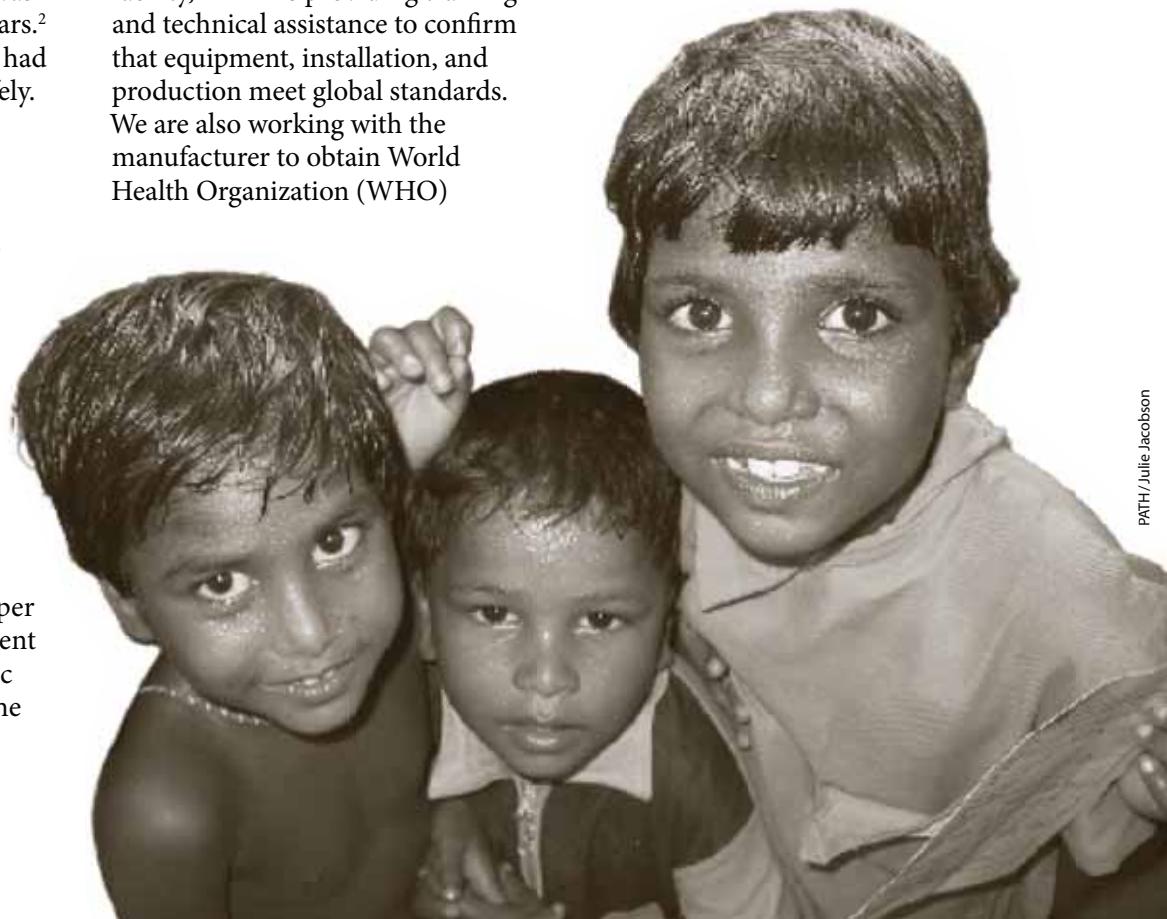
As PATH's Japanese Encephalitis Project draws to a close, we are helping to maintain momentum for controlling this often-overlooked disease. At the new manufacturing facility, PATH is providing training and technical assistance to confirm that equipment, installation, and production meet global standards. We are also working with the manufacturer to obtain World Health Organization (WHO)

prequalification of the SA 14-14-2 vaccine. This will allow the United Nations Children's Fund (UNICEF) to procure the vaccine for routine immunization programs, assistance many developing countries rely upon.

Many of our partners—including WHO, the US Centers for Disease Control and Prevention, and UNICEF—are working to develop a strategic plan that calls for control of JE by 2015. Together, the global health community will continue the work in surveillance, procurement support, technical assistance, and advocacy needed to protect Asia's children against death and disability. ■

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## Behavior change

<b>Project name</b>	Inter-American Alliance for the Prevention of Gender-based Violence (InterCambios)
<b>Locations</b>	Argentina, Belize, Brazil, Caribbean countries (Bahamas, Barbados, British Virgin Islands, Grand Cayman, Jamaica, St. Kitts), Chile, Colombia, Costa Rica, Dominican Republic, Guatemala, El Salvador, Honduras, Mexico, Nicaragua, Panama, Peru, and the United States
<b>Methods</b>	Advocacy, behavior change communication, systems strengthening, technical assistance
<b>Partners</b>	Armonie, Instituto Promundo, International Planned Parenthood Federation, Ipas, Pan American Health Organization, Puntos de Encuentro.
<b>Funder</b>	Swedish International Development Cooperation Agency

### For more information

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 Visit  
[www.alianzaintercambios.org](http://www.alianzaintercambios.org)  
 to learn more.

# Halting gender-based violence

Alliance provides evidence, training, and support for groups in Latin America and the Caribbean

GENDER-BASED VIOLENCE OCCURS around the world. Behind closed doors, women who experience violence face chronic pain, poor health, emotional distress, increased risk of unwanted pregnancy and sexually transmitted infections, and pregnancy complications. Although the global health community is beginning to recognize gender-based violence as a public health problem and serious human rights violation, governments, health programs, and communities are challenged to develop an effective response.

Recognizing the need for collaboration and coordination across borders to address this widespread issue, PATH and other organizations in 2004 formed the Inter-American Alliance for the Prevention of Gender-Based Violence (InterCambios). PATH hosts the InterCambios secretariat. Our involvement in the alliance complements our other work in Latin America and the Caribbean, which includes work related to cervical cancer prevention, nutrition, adolescent health, rapid diagnostics, and vaccine introduction to reduce severe diarrhea.

### Evidence-based approaches

InterCambios works in four key areas:

- Strengthening care and training models.
- Conducting research, developing information systems, and evaluating interventions.

- Advocating for public policy that addresses gender-based violence.
- Communicating for social change.

Over the past five years, InterCambios has gained recognition for its evidence-based approach to strengthening the capacity of communities and health systems to address gender-based violence. The alliance's actions in Latin America and the Caribbean have given local groups and initiatives greater access to updated technical resources, training, and information on violence-related issues. The group has also contributed to analysis of the interaction between violence against women and other vital health indicators.

*Gender-based violence is being addressed as a public health problem as well as a human rights violation.*

### Training to promote understanding

Service providers and community members may not always understand the day-to-day realities of women who experience abuse. To sensitize providers to these experiences, InterCambios developed a training methodology called In Her Shoes. Originally created by the Washington State Coalition Against Domestic Violence, the curriculum allows participants to put themselves in the shoes of women experiencing



**Training sensitizes health workers and community members to the day-to-day realities of women who experience abuse.**

violence and understand the barriers they face for getting help. InterCambios adapted the methodology for a Latin American audience and now uses it as an awareness-building and training tool to demonstrate that violence is a community and global problem, not just a personal one. In Her Shoes encourages participants to analyze the capacities of institutions to assist women living with violence, allows them to recognize each person's role in responding to the problem, and promotes work to eradicate violence.

Government institutions, grassroots groups, and nongovernmental organizations in several Central American countries now use In Her Shoes to train health workers and social service providers.

InterCambios has trained 1,200 people in the methodology and distributed 1,420 copies of the curriculum to organizations in Latin America, Spain, and the United States. The alliance will soon conduct a more extensive evaluation of the methodology to generate evidence of its impact. The group plans to adapt In Her Shoes for audiences in Africa, Brazil, and the

Caribbean and produce a version for adolescents.

In Honduras, In Her Shoes has stimulated a health care model for identifying and helping women who experience violence. The Public Health Secretariat's Operational Technical Team has collaborated with InterCambios member organizations to produce two training plans for health personnel. A specialized gender-based violence plan offers guidelines for the detection, care, risk assessment, registration, and referral of cases. InterCambios is coordinating and negotiating with Honduran health authorities for the model's gradual implementation into the public health system.

### **Improving knowledge on violence**

For successful advocacy and response to gender-based violence, providers need up-to-date information about the causes of violence, its prevalence, and the effectiveness of interventions. InterCambios offers technical assistance to organizations and

governmental agencies to support their work in addressing this issue.

For example, InterCambios facilitated a Spanish translation of the book *Researching Violence Against Women: A Practical Guide for Researchers and Activists*, authored by PATH and the World Health Organization, to make it available to activists and researchers in Latin America. In Nicaragua, InterCambios organized a pilot course based on the guide and established a teaching team of researchers and university lecturers to extend use of the course throughout Latin America and Africa. The course was validated with activists and researchers in both regions. Participants have already used their training in research studies in El Salvador, Honduras, Mexico, and Nicaragua. InterCambios will soon update the guide with an addendum on research related to femicide.

The alliance also disseminates resources, ideas, and experiences internationally through its website, [www.alianzaintercambios.org](http://www.alianzaintercambios.org), making it an important reference point for prevention of violence against women.

### **Future challenges**

InterCambios serves as a valuable resource on gender-based violence in Latin America and continues to expand its resources to reach all women who face abuse. The alliance's next steps include developing a comprehensive approach to sexual violence, focusing on violence against indigenous women, and helping to improve interventions with men in alliance with groups such as MenEngage. Through its collaborative work model, InterCambios has made critical strides in strengthening institutional responses to gender-based violence and in improving women's health and safety. ■

## Technology development

<b>Project name</b>	Center for Point-of-Care Diagnostics for Global Health
<b>Location</b>	United States
<b>Methods</b>	Clinical studies, demonstration projects, needs assessments, technology development, training
<b>Partners</b>	Commercial diagnostics firms, University of Washington
<b>Funder</b>	National Institute of Biomedical Imaging and Bioengineering at the National Institutes of Health

### For more information

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Visit [www.path.org/dxcenter](http://www.path.org/dxcenter) to learn more.

# Bringing diagnostic tests to low-resource settings

## New center at PATH's Seattle headquarters unites technology developers and users

ALTHOUGH DIAGNOSTIC TESTS ARE a mainstay of health care in high-income nations, they are often unavailable, unreliable, or unaffordable in developing countries. The scarcity of tests appropriate for low-resource settings makes it more difficult to detect and treat disease and contributes to health inequities around the world.

The good news is that work to improve diagnostic testing in these settings is gaining momentum. Factors pushing development and implementation of new diagnostic tools include the growing problem of drug-resistant bacterial pathogens, the rising cost of effective therapies, and the increased threat of communicable disease pandemics stemming from globalization. At the same time, scientific and technical advances are providing new methods for effective, rapid detection of pathogens and biochemical disease markers.

To help develop promising diagnostic technologies, PATH has launched the Center for Point-of-Care Diagnostics for Global Health (GHDx Center). The center works to increase the availability and affordability of diagnostic tests appropriate for low-resource settings, especially for use by community clinics and other local health care providers.

### Challenges to diagnostic testing in developing countries

Designing and deploying diagnostic tests appropriate for low-resource

settings is no small feat. Developing countries typically have very limited health care facilities with little supporting clinical laboratory infrastructure. Even basic resources such as dependable supplies of electricity and clean water may be lacking, especially in rural areas.

Researchers have identified a number of key factors that facilitate adoption of diagnostic technologies in low-resource settings.<sup>1,2</sup> They include:

- **Simplicity of use.** The less training and equipment needed, the better.
- **Speed.** Ideally, the test will give results in less than one hour, or at least the same day.
- **Convenience.** Collection and processing of specimens (such as blood or stool samples) should be simple and convenient.
- **Stability.** The test device and related supplies should be stable for one or two years at ambient temperature.
- **Accuracy.** The test must have appropriate sensitivity and specificity and be able to distinguish present from past infection.
- **Cost.** This includes cost-effectiveness as well as affordability.

The difficulty of successfully addressing all of these issues—as well as the need to provide a good return on investment—have kept many commercial firms from developing products targeted to low-income countries.

## Facilitating collaboration

The GHDx Center is a prime example of how PATH's offices in North America and Western Europe facilitate collaboration among global health stakeholders, including commercial firms, universities, nonprofit organizations, foundations, government agencies, and multilateral groups. In its partnerships with commercial firms, the center helps to reduce investment risk associated with development and introduction of health technologies targeted to less-lucrative markets.

Managed by PATH in partnership with the University of Washington, the Seattle-based GHDx Center conducts four core activities:

- Clinical needs assessments.
- Support of exploratory technology projects.
- Clinical testing of prototype point-of-care diagnostics.
- Training on the realities of point-of-care tests for low-resource settings.

## Assessing needs and supporting exploratory projects

The GHDx Center assesses clinical needs for diagnostic testing to help developing countries select technologies for further evaluation and to help technology developers navigate potential pitfalls on the pathway to successful commercialization and adoption. Center staff, for example, recently completed assessments of diagnostic needs related to malaria, tuberculosis, and other diseases in Nicaragua and are now finalizing reports. Similar work is being conducted in the Philippines.

Through a competitive solicitation process, the GHDx Center also identifies, selects, and supports innovative technologies that promise to improve public health

outcomes. Candidate technologies are assessed for anticipated health impact, relevance to the needs and realities of low-resource settings, and commercialization prospects.

The first solicitation for exploratory projects yielded 32 letters of interest, and ten applicants were invited to submit full applications. Awardees will soon be announced. Each project will be funded up to \$250,000 over two years.

## Providing clinical testing and training

Another function of the GHDx Center is to conduct laboratory and field-based clinical testing of selected prototype tests. PATH is currently completing a first round of laboratory evaluation of prototype devices to improve diagnosis of infections that cause death and disability among pregnant women and their babies. Concurrently, we are engaging developers of promising technologies for a second round of laboratory and field-based evaluation to be initiated in 2010.

A training program sponsored by the GHDx Center brings together individuals from both high- and low-resource settings with varied backgrounds in technology development, laboratory-based diagnostic methods, and disease specialties.

Taught cooperatively by University of Washington faculty and PATH researchers, the program creates a networked group of researchers and practitioners who can adapt state-of-the-art technologies to

meet diagnostic challenges in low-resource settings. About 30 people representing a variety of countries and organizations attended the Second Annual Course on Point-of-Care Diagnostics in Global Health, held July 13 to 17 at the University of Washington campus in Seattle.

## Ensuring product usability under real-world conditions

Although the need for better diagnostic testing in developing countries is increasing, so are opportunities to create affordable, effective tests targeted to use in low-resource settings. The GHDx Center at PATH is working on multiple fronts to facilitate collaboration and training of both developers and users of diagnostic technologies. The resulting interpersonal networks will help to ensure that future diagnostic products not only perform well in the laboratory but also under real-world conditions in the poorest regions. ■



PATH/Tala de los Santos

In Nicaragua, staff representing the GHDx Center have assessed needs for diagnostic tests, including rapid assays for leptospirosis, a neglected disease.

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## Closing gaps in protection against influenza, from page 1

### Assessing seasonal influenza vaccine effectiveness

PATH is partnering with two research institutes to conduct the three-year trial to assess protection provided to Senegalese children by an influenza vaccine that has already proved safe and effective in developed countries. Senegal is an ideal location for the study because it is one of only a few African countries with a strong National Influenza Center. The results of the trial will be applicable to similar tropical regions throughout Africa.

#### Vaccine effectiveness in children

To date, investigators have vaccinated nearly 8,000 young children from randomly selected villages in the Fatick District of Senegal. Children from half of the villages received a seasonal influenza vaccine made from three inactivated influenza strains. For comparison, the children from the remaining villages received a beneficial control vaccine—inactivated polio vaccine. Both vaccines have been approved and used in many countries around the world, including Senegal.

During the months following vaccination, researchers will monitor respiratory illnesses among vaccinated children in the study villages to determine the number of infections caused by influenza and the number prevented by vaccine. By evaluating whether the influenza vaccine reduces disease, the study will generate data that may help ministry of health officials decide how to better use the vaccine in Senegal.

#### Surveillance and disease reduction at the community level

Another objective of the study is to measure rates of influenza caused by circulating strains, including influenza A(H1N1), to better understand the effect



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**Thousands of children in Senegal are receiving influenza vaccine in the largest study of its kind ever conducted in Africa.**

of influenza on populations in tropical, developing Africa. Researchers will monitor influenza illnesses among all persons vaccinated and unvaccinated. By measuring the rates of influenza in the unvaccinated population, researchers will evaluate the extent to which immunizing only children, the suspected main transmitters of the virus, effectively reduces influenza in the rest of the community. Such information will be useful for public health officials, since whole populations could be protected by administering fewer doses at less cost. This part of the study will also help strengthen the capacity of Senegal's national influenza surveillance program.

#### Developing new influenza vaccines for low-resource countries

PATH's Influenza Vaccine Project is another component of our global influenza strategy. The project's goal is to advance new vaccines by focusing on novel technologies

that can make vaccination more accessible, affordable, and available in the developing world in a pandemic. The project is a response to studies showing that current influenza vaccine production capacity would fall short of anticipated global need within the first six months of a potential pandemic. Without enough vaccine to go around, traditionally marginalized countries in regions such as sub-Saharan Africa could fall through the cracks in a global immunization program. These challenges underscore the need to develop new, affordable vaccines that can be readily available for the poorest of the poor. The PATH project complements global efforts by the World Health Organization (WHO) to develop new influenza vaccines, increase demand for seasonal vaccines, and enhance influenza vaccine production capacity.<sup>3</sup>

The current outbreak of influenza A(H1N1) has been a reminder that influenza can strike

anywhere at any time, bringing to the forefront the importance of being able to mass produce pandemic influenza vaccine in real time. PATH is collaborating with private- and public-sector partners on a diverse vaccine-development portfolio focused on early stage science. Included are recombinant technologies to enable more efficient manufacturing than is possible with current methods for producing influenza vaccine. The project is also evaluating new vaccine adjuvants that can improve the immune response and conserve doses. Another component of PATH's portfolio is the development of influenza vaccines made from attenuated virus that can be produced inexpensively, quickly, and in large quantities.

### Addressing influenza today and tomorrow

PATH's multipronged vaccine strategy against influenza in Africa and the rest of the developing world not only helps to protect low-resource countries from the effects of the disease but also helps to empower those countries

to become integral parts of the solution. As part of this effort, PATH is doing what it can to complement WHO in its mandate to support low-resource country vaccine producers. As PATH continues the pursuit of new vaccine technologies to protect vulnerable populations against current and future influenza pandemics, it is also helping strengthen surveillance and understanding about the disease in Africa. While the world awaits an optimal pandemic vaccine, detecting the virus in Africa as early as possible is a critical step toward helping global health systems speed response times to save lives. ■

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### Responding to influenza A(H1N1)

PATH has actively participated in the global response to the influenza A(H1N1) pandemic. At the request of the Pan American Health Organization, for example, a staff member from PATH's Nicaragua office traveled to Mexico in April to help investigate the outbreak and plan a response. Juan José Amador, MD, PATH's director of health systems and technology in Nicaragua, collaborated with Mexican epidemiologists and staff from the US Centers for Disease Control and Prevention (CDC) in conducting research, training local health workers to use geographic information systems, and meeting with local government officials.

Similarly, Rick Bright, PhD, scientific director of PATH's Influenza Vaccine Project, traveled to Geneva in May to assist WHO's Institute for Vaccine Research as a member of the influenza A(H1N1) vaccine task force.

PATH has also distributed up-to-date information to health professionals around the world. Through our website, [www.path.org](http://www.path.org), we have provided links to the latest information from WHO and the CDC. Our Vaccine Resource Library has also made available several recent reports related to influenza A(H1N1) and pandemic influenza (see [www.path.org/vaccineresources/influenza.php](http://www.path.org/vaccineresources/influenza.php)).

## Disease surveillance and prevention

#### Project name

Senegal seasonal inactivated influenza vaccine effectiveness trial; Influenza Vaccine Project

#### Locations

Senegal and other developing countries

#### Methods

Capacity-building, disease surveillance, post-licensure field trial, vaccine development

#### Partners

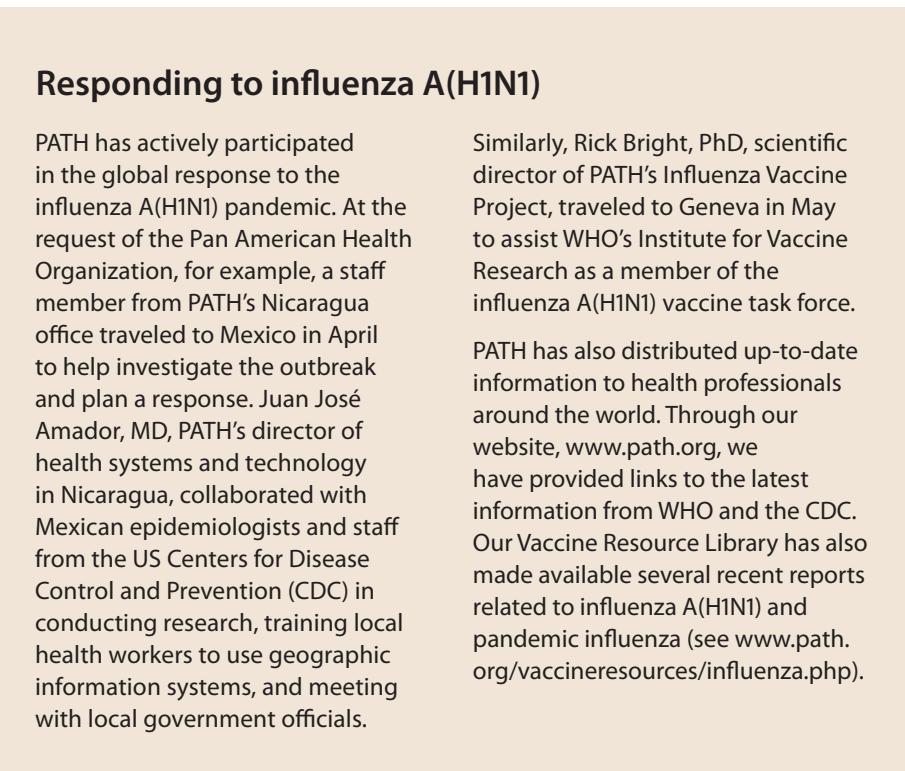
Institut de Recherche pour le Développement and Institut Pasteur de Dakar (Senegal trial); various public- and private-sector partners around the world (Influenza Vaccine Project)

#### Funders

US Centers for Disease Control and Prevention (Senegal trial); Bill & Melinda Gates Foundation (Influenza Vaccine Project)

#### For more information

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**Photo:** © PATH/John Wessells

# Expanding our global presence

Over the past few years, PATH's global reach has expanded, especially in Africa. We now work in more than 70 countries around the world in the areas of health technologies, maternal and child health, reproductive health, vaccines and immunization, and emerging and epidemic diseases (including AIDS, malaria, and tuberculosis). We have offices in 30 cities in 20 countries in five global regions.



## North America and Western Europe

PATH offices in the United States, Belgium, and France are centers of collaboration and leadership. They facilitate partnerships with the foundations and governments that support our work, and they lead PATH's global programs, such as work to develop health technologies (see article on page 8). PATH grew from a nonprofit organization founded in Seattle in the mid-1970s to increase access to contraceptive technologies around the world.

## Latin America and the Caribbean

Offices in Nicaragua and Peru provide a foundation for our projects in Latin America and the Caribbean. Our work here includes helping to prevent gender-based violence (see article on page 6) while meeting other diverse health needs. PATH's office in Managua was established in 2003, making it one of the more recent additions to our global network.

## Africa

PATH's work in 26 African nations is supported by offices in Côte d'Ivoire, Ghana, Kenya, Senegal, South Africa, Tanzania, Uganda, and Zambia. In addition to our efforts to control influenza (see article on page 1), we help to meet complex needs related to malaria, HIV/AIDS, and other health issues in many of the world's poorest countries. Our work here began in the late 1970s with distribution of family planning materials for low-literate audiences.

## Eastern Europe

Our office in Ukraine is a hub for activities in Eastern Europe, including Belarus, Georgia, and Moldova. Many of our initiatives in this region focus on strengthening health systems, especially in relation to care for people with tuberculosis or HIV/AIDS (see article on page 2). We began our work here in the mid-1990s.

## Asia

PATH serves this region from offices in Cambodia, China, India, Indonesia, Thailand, and Vietnam. Our work includes harnessing regional vaccine manufacturing capacity to prevent Japanese encephalitis (see article on page 4) as well as implementing other interventions to improve health in the world's most populous region. In the late 1970s, our very first project was helping Chinese manufacturers set up facilities to make high-quality condoms and other contraceptives.

PATH is an international nonprofit organization that creates sustainable, culturally relevant solutions that enable communities worldwide to break longstanding cycles of poor health. By collaborating with diverse public- and private-sector partners, we help provide appropriate health technologies and vital strategies that change the way people think and act. Our work improves global health and well-being. For more information, please visit [www.path.org](http://www.path.org).

*Directions in Global Health* shares information about PATH's programmatic work with colleagues around the world. To subscribe, please send your contact information to [publications@path.org](mailto:publications@path.org). To learn more about PATH's work, visit the PATH website or subscribe to one or more of our electronic newsletters. These include *News From PATH* and several topic-specific e-newsletters. To subscribe, go to [www.path.org/sign-up.php#news](http://www.path.org/sign-up.php#news).

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