PERSPECTIVES in Health

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BEST BUYS for Public Health

HIV: It is better to know (p. 10)

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First Word

Setting priorities in health

Cost-effectiveness analysis has won growing acceptance as a tool to help policymakers allocate health resources more effectively. The approach promotes better health outcomes by using evidence, knowledge, and analysis to inform decisions about which health interventions to use. It also promotes accountability by encouraging decisions based on objective criteria about how to advance the public good. This is particularly important in the health sector, where misspent funds can mean lives lost.

The Disease Control Priorities Project, the subject of our cover story, "Best Buys for Public Health," uses cost-effectiveness analysis to identify the most efficient interventions to improve health in the developing world. Its findings were presented at a special session of the 2006 Directing Council meeting at Pan American Health Organization (PAHO) headquarters last September. In addition to the 10 best buys, the project also highlights 17 initiatives described as among the world's most successful large-scale public health interventions. These include the PAHO-led campaign to eliminate polio from the Western Hemisphere and the more recent Southern Cone Initiative to Control/Eliminate Chagas Disease, as well as the PAHO-supported salt fluoridation program in Jamaica. (The 17 case studies were selected by the Center for Global Development's What Works Working Group and published in 2005 as *Millions Saved: Proven Successes in Global Health*.)

It is tempting—and perhaps legitimate—to ask whether all the health interventions used in PAHO's technical cooperation programs would pass the test of cost-effectiveness. The results of such a test would, of course, be relative; some would emerge as more cost-effective than others. But in reality, the data required to make such assessments often do not exist or are at best difficult to identify. To cite two examples from other articles in this issue: How would we meaningfully assess the cost-effectiveness of Fique Sabendo, a public service campaign that seeks to reduce HIV/AIDS rates by encouraging all sexually active Brazilians to get tested? How would we measure the cost-effectiveness of efforts to encourage healthier lifestyles (in a holistic sense) through health-promoting schools? Does the difficulty of demonstrating the cost-effectiveness of these programs diminish their worth?

To their credit, the Disease Control Priorities Project and other proponents of cost-effectiveness analysis acknowledge that it is only one tool among many that should be used in public health policymaking. Other criteria—epidemiological, medical, political, cultural, and ethical—play a role as well. In its various reports, the Disease Control Priorities Project insists that the principle of equity should be a separate and equally important criterion in allocating health resources. This is particularly important in Latin America and the Caribbean, where "macro" indicators of health have risen steadily in recent decades but millions of people continue to suffer illness and premature death due to dramatically unequal access to health. Health inequity is an enduring problem that cannot be resolved through technical means. It requires attention to the social determinants of health as well as special efforts to target those who are in greatest need.

One of the key messages of the Disease Control Priorities Project is a hopeful one for those concerned about equity: Rich and poor countries alike can improve (and have improved) their populations' health through "technical progress," that is, by applying the appropriate knowledge and technology to health problems. Developing countries do not need to wait for long-term socioeconomic gains to achieve better health (indeed, good population health is a requisite for socioeconomic development). Fortunately, PAHO and its member countries understand this and are currently developing a new Health Agenda for the Americas that will define our region's collective health priorities and actions over the next 10 years. As we progress in this effort, we would do well to examine closely the findings of efforts like the Disease Control Priorities Project while embracing equity and solidarity as our guiding principles.

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Director

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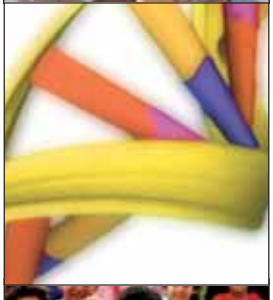


Columns

Front cover:
In public health—as with any investment—where you put your money counts. The Disease Control Priorities Project has identified cost-effective interventions to prevent and control the diseases and conditions that have the greatest impact on health in the developing world.
(See story p. 2.)

Cover design: Bola Oyeleye

BEST BUYS for Public Health

by Donna Eberwine-Villagrán

Good health need not be a luxury reserved for the world's rich. By investing in cost-effective interventions, developing countries can dramatically improve their populations' health.

What if someone told you that you could save a "year of healthy human life" for just $5 if you spent it on indoor spraying of mosquitoes or promotion of breastfeeding? What if the same gain could be had for only $2 spent on putting speed bumps at dangerous intersections?

If you were a health planner, budgeter, or policymaker, chances are these recommendations would catch your eye. And that's exactly what they're meant to do, says George Alleyne, former director of the Pan American Health Organization (PAHO) and one of nine editors of the recently published *Disease Control Priorities in Developing Countries, 2nd Edition*.

"Everyone in public health wants to know what works and where they should put their resources," says Alleyne.

The "best health buys" for developing countries are based on the contributions of more than 500 experts from science, epidemiology, health economics, and public health consulted by the Disease Control Priorities Project. They examined the impact of hundreds of diseases and health conditions and the cost-effectiveness of hundreds of interventions. The "Top 10" buys (see p. 7) include some surprisingly simple recommendations, including speed bumps to reduce traffic injuries, insecticide-treated bed nets to prevent malaria, and increased taxes on tobacco, which Alleyne terms "the single most cost-effective intervention for preventing cardiovascular disease." Other recommendations from the study range from directly observed therapy short course (DOTS) for tuberculosis to training programs for birth attendants and salt fluoridation to prevent dental caries.

Health action matters

One of the central arguments of Disease Control Priorities is that technical progress, including health interventions, can have a major impact on health regardless of a country's level of economic development. During the late 20th century, for example, low- and middle-income countries such as Chile, Costa Rica, Cuba, and Sri Lanka succeeded in improving infant, child, and maternal survival rates by investing in sanitation, immunization, and skilled care during childbirth. Countries at similar levels of development that did not adopt these measures did not see similar gains in health.

"This means that waiting for economic growth to improve health would be a mistake because countries can achieve a great deal by investing in proven interventions," says Alleyne. "It also means that even a poor country with a relatively weak health system can improve its citizens' health by investing in the right interventions. This, in a real sense, levels the playing field. Any country can make progress in health if they make the right decisions and the right investments."

WHO-CHOICEs for health

To help countries reap the benefits of cost-effectiveness analysis for health planning and policymaking, the World Health Organization (WHO) in 1998 established WHO-CHOICE (Choosing Interventions that are Cost Effective). The program has collected data on and analyzed the cost-effectiveness of more than 700 single and combined health interventions for the major illnesses and conditions that contribute to the burden of disease. The analyses are region-specific and are accessible in regional databases. Using a "contextualization tool," health policymakers can adapt the results to specific country settings. For more information, visit www.who.int/choice.

The converse is also true. Health inequalities have arisen precisely because cost-effective interventions have been applied in some places and not in others, or to the benefit of more privileged population groups rather than the less privileged. This can be seen in countries where vaccine-preventable diseases remain a major burden versus countries where routine immunization has reduced those diseases to a bare minimum. It can also be seen in maternal mortality rates, which are dramatically higher in countries where many women deliver babies without help from skilled health care providers.

Choosing interventions

Disease Control Priorities identifies hundreds of cost-effective health interventions (see summaries on pages 5–9). But what do they have in common? To address this question, the Center for Global Development's What Works Working Group solicited nominations of successful interventions from Disease Control Priorities' scientific contributors. The group then selected and analyzed 17 large-scale health interventions whose impact showed a cost-effectiveness ratio of less than $100 per disability-adjusted life year, or DALY, saved.

Their analysis, published separately in *Millions Saved: Proven Successes in Global Health*, concluded that there was no single formula for success, but that "some key elements recur, namely, political leadership, technological innovation, expert consensus regarding the approach, effective use of information, and sufficient public financial resources."

Disease Control Priorities points out that proven interventions may work differently in different settings, and their cost-effectiveness can vary widely from one place to another. Family planning programs, for example, tend to be more cost-effective in South Asia and Sub-Saharan Africa than in East Asia and the Pacific. The cost-effectiveness of any intervention tends to increase as the program is scaled up, since the marginal cost of reaching each new person is much lower than the initial set-up costs.

And while a good intervention can work well even in a country with a generally weak health system, its cost-effectiveness will be greater in a well-functioning system. The Integrated Management of Childhood Illness (IMCI) strategy, for example, has proved less cost-effective in countries whose health systems are plagued by high turnover of trained staff and shortages in equipment, supplies, and general funds.

Despite these caveats, Disease Control Priorities sends a strong and clear message about the need to base health policy on the right kind of knowledge and evidence. *Priorities in Health*, a shorter companion volume to the 1,339-page *Disease Control Priorities in Developing Countries*, offers the following simple but urgent prescription for health policymakers: "Identify the cost-effective interventions for those diseases that impose the largest burdens around the globe or in target regions or populations that exhibit grave need or inequity and determine how to deliver those interventions effectively, efficiently, and equitably."

Donna Eberwine-Villagrán is editor of Perspectives in Health.

PAHO

▼ Childhood immunization has proven to be one of the most cost-effective public health interventions of all time.

What works in...

Adolescent health

More than 33 percent of the disease burden and nearly 60 percent of premature deaths among adults can be associated with risk factors adopted or experienced in adolescence, including tobacco and alcohol use, poor eating habits, sexual abuse, and risky sex.

Prevention should be emphasized because so much of the disease burden is preventable. Effective programs include multisector solutions that link health sector interventions with other types of interventions, such as life skills, health and sexuality education, peer education, community involvement, clinical health services, and private sector programs. Programs for adolescents require an approach different from simply applying programs for adults to a younger population. Effective programs for adolescents share a set of common principles, such as recognizing diversity and addressing nonhealth factors that influence youth health. The special needs of poor adolescents must also be addressed.

Alcohol

Alcohol accounts for 4 percent of the global burden of disease, with negative effects ranging from high blood pressure and liver damage to accidental injuries and deaths (greatly outweighing benefits such as reduction in coronary heart disease). In regions where high-risk drinking is more prevalent (Europe and Central Asia, Latin America and the Caribbean, and Sub-Saharan Africa), tax increases are the most cost-effective strategy to reduce alcohol's negative health impact, followed by advertising bans on alcohol products, reduced access to retail outlets, and brief interventions such as physician advice in primary care. In regions with lower rates of high-risk alcohol use (East Asia, the Pacific, and South Asia), excise taxes are less cost-effective. In South Asia, brief physician advice and random breath testing are both cost-effective, while in East Asia and the Pacific, the most cost-effective interventions are brief physician advice, a comprehensive ban on advertising, and reduced access to retail outlets.

Domestic violence

Intervening in the earliest years of life may reduce the possibility that an individual will use violence. Primary interventions take place before violence occurs and include addressing the cultural perceptions of violence, limiting access to lethal weapons, improving parenting, and instituting programs aimed at children. Secondary methods address the immediate effects of violent incidents, while tertiary concerns address the long-term consequences of interpersonal violence. A five-faceted plan allows each country to address interpersonal violence: more accurate data collection, increased research, an emphasis on primary prevention, more widely available victim support services, and a national anti-interpersonal violence prevention plan.

Cardiovascular disease

The vast majority of CVD is attributed to such risk factors as obesity, which is escalating in the developing world at an alarming pace, as well as high blood pressure and high cholesterol, extensive tobacco and alcohol use, and low vegetable and fruit consumption. Effective interventions to reduce risk factors in developing countries likely will involve a mix of treatment and education.

Former PAHO Director George Alleyne notes that "tobacco taxation is the single most cost-effective intervention for cardiovascular disease." Cost-effective medical interventions (for patients with high risk of CVD) include ACE (angiotensin-converting enzyme) inhibitors, beta-blockers, off-patent statins, and aspirin. Compliance could be improved and costs reduced by incorporating several medications into a "polypill" for long-term use. Above all, education is essential. Health care workers need training to implement clinical guidelines, and patients must be educated about the importance of adhering to their medical regimens. These interventions can reap future savings in terms of reduced medical costs and improved quality of life and productivity.

Developmental disabilities

Folic acid fortification of the food supply is one of three cost-effective interventions for learning and developmental disabilities. Prenatal screening and selective pregnancy termination can be highly cost-effective under some conditions, but these methods raise ethical, social, and cultural con-

▼ Simple measures such as teaching mothers and birth attendants to keep babies warm and clean can save newborn lives.

photos by Armando Waak/PAHO

▲ A strong focus on primary health care can produce major gains in health and development. This includes creating dynamic health teams in well-equiped settings.

cerns that may preclude their use. Neonatal screening and treatment for congenital hypothyroidism are highly cost-effective in developed countries, but effectiveness may be reduced in places where only a part of the newborn population can be reached by screening. An intervention that is not recommended is electronic fetal monitoring in labor, because it has been associated with a higher risk of cerebral palsy and is unsuccessful in preventing neurological disability from premature birth.

Diabetes

A number of interventions are particularly appropriate for developing countries because the savings in medical costs associated with short- and long-term complications of diabetes greatly exceed the costs of interventions such as glycemic control, blood pressure control, and foot care. In addition, assuring adequate access to insulin and promoting patient education —both relatively low-cost interventions—should be top priorities for developing countries. Moreover, interventions that empower patients, such as reminders to make follow-up appointments, can be successful components of diabetes programs.

Diarrheal disease

Preventive strategies include promotion of exclusive breastfeeding of infants; improved feeding practices to prevent or treat malnutrition; vaccination against rotavirus, cholera, and measles; improved water and sanitation facilities; and promotion of personal and domestic hygiene. Recent case management advances include reformulated oral rehydration therapy (ORT) and zinc supplementation. Some of these involve trade-offs. For example, while ORT and water and sanitation interventions are more effective than either breastfeeding promotion or vaccinations in reducing morbidity and mortality, they are less cost-effective. In addition to proven case management and prevention strategies, public-private partnerships for vaccine development, improved ORT practices, and low-technology solutions to enhance water quality at the point of use offer promising avenues for combating diarrheal diseases in the short term.

HIV/AIDS

Despite the alarming speed with which HIV/AIDS continues to spread around the world, several countries have achieved significant successes in curbing its transmission, including interventions that promote condom use, target populations that transmit the virus in both high- and low-risk groups, and focus on surveillance and control of sexually transmitted infections. Evidence is mounting in support of certain interventions, including school-based sex education, peer education for sex workers, avoidance of unwanted pregnancies among infected mothers, use of antiretroviral therapy by infected mothers, needle-exchange programs for illegal drug users, and implementation of blood safety practices such as screening all donated blood. Countries with low-level epidemics should emphasize interventions that target individuals at especially high risk of being infected or transmitting the virus. Countries experiencing generalized epidemics should target their entire population.

Malaria control

Efforts to cut the malaria burden in half by 2010 involve a number of strategies, including early diagnosis and treatment; proper use of drugs, including new artemisinin-based therapies; intermittent preventive therapy during pregnancy and infancy; use of insecticide-treated nets; and vector control.

Maternal health

Maternal and perinatal conditions represent the single largest contributor to the global disease burden; thus, reducing the burden is an international priority. Best approaches include population-based interventions to promote healthy behaviors and reduce mistimed pregnancies; nutritional interventions to address undernutrition or micronutrient deficiencies in women of reproductive age; and a continuum of care for mother and baby, including birth preparedness, involvement of the

father, adequate primary-level care, access to emergency obstetric and hospital care, and delivery and postpartum care. The most successful interventions are those that are employed in combination.

Mental illness

Cost-effective interventions include outpatient treatment with first-generation antipsychotic or mood-stabilizing drugs as well as psychosocial counseling for schizophrenia and bipolar disorder, and treatment with selective serotonin reuptake inhibitors for depression and panic disorder. These interventions can be implemented as the first steps to overcoming cultural, financial, and structural barriers that prevent people from seeking and receiving treatment.

Newborn survival

Addressing newborn mortality requires links within the continuum of care from maternal health through pregnancy, childbirth, early neonatal care, and general child health. This creates a particular challenge in poor countries struggling with inadequate levels of skilled care and unstable health care systems. Nevertheless, community-level interventions form a first step. These encompass essential newborn care at time of birth, which can be carried out at home by trained alternative health workers; basic newborn resuscitation using a self-inflating bag and air; and extra care for small babies, especially feeding and warming.

Not only are high-impact, low-cost, feasible interventions available, but they could avert close to 70 percent of the world's neonatal deaths. An interim, phased-in strategy may be most effective in developing countries. For example, community services could be used now, as professional care is being strengthened. While countries continue to seek funding for more comprehensive health systems, simpler approaches at the family-community level and through outreach services can save many lives.

Nutrition

Few health interventions are as cost-effective as programs that promote appropriate feeding and correct micronutrient deficiencies, with iodine supplementation or fortification being the most widespread and successful. Nutritional interventions not only preserve or improve cognitive function but also contribute to improved adult stature and worker productivity. In addition, reducing malnutrition frees scarce health resources to be allocated to other health crises. While progress has been made in correcting vitamin A deficiency and promoting breastfeeding, important challenges remain in combating iron and zinc deficiencies.

▲ Patient education combined with treatment using low-cost medications is among the most cost-effective interventions to reduce the risk of cardiovascular disease.

Oral health

The use of fluoride has proved effective against cavities through a variety of different mediums, including its addition to centralized water supplies where possible as well as to salt, toothpaste, and milk, and via fluoride capsules and rinses. Nationalized oral health programs demonstrate a decline in caries, though the effectiveness of specific programs is unknown. The prevention of oral disease proves to be more cost-effective than restorative treatment after the onset of disease. Good examples are community mobilization and public policy to combat oral disease, in conjunction with programs instructing preschool and elementary school-age children in proper oral hygiene.

Parasitic worms

Regular deworming helps reduce malnutrition and improves motor and language development in very young children; has a positive effect on nutritional status, physical fitness, growth, and language development in school-age children; and improves maternal hemoglobin as well as birth weight and child survival. The advantage of periodic deworming lies in its simplicity: Only one tablet per individual, which can be administered by people without medical training, is required. Until new approaches become available, whether a hookworm vaccine or improved sanitation infrastructures, deworming for school-age children remains the most practical way to control helminth infections in the developing world.

Primary health care

Evidence from high-income countries may well be applicable to the developing world: A strong orientation to primary care is likely to result in better health levels and lower health care costs. The creation of dynamic health teams at the primary level is one of the main requirements for scaling up effective primary care. In many settings, the opportunity exists to increase the efficiency of primary care teams by giving attention to working conditions, assuring functioning equipment, and maintaining a stable drug supply. The

▲ Directly observed therapy (DOTS) has proven to be cost-effective in curing tuberculosis. But the full cost of DOTS may be greater in countries where the health sector in general needs more investment.

challenge in these countries is not only to inject additional resources—financial and human—into the primary care sector but also to make a political commitment to the centrality of general primary care in the battle against devastating diseases and their causes. Efficient primary care in turn paves the way for major health and development gains that provide good value for the money.

Health systems

It is possible to deliver good-quality care even in resource-poor settings. Legal mandates and regulations, professional oversight, peer review, and resource allocation formulas are among the tools available to decision makers and managers. With these tools, health systems can be strengthened in different country contexts to deliver interventions effectively, efficiently, and equitably. But the best strategies often are incremental and gradual and encompass action at all levels, from increasing leadership at the national level to enhancing support at the local level.

Tobacco addiction

Studies from high-, low-, and middle-income countries show that tobacco use can be reduced through interventions such as tobacco tax increases, information about health risks, restrictions on smoking in public and workplaces, bans on advertising and promotion, and increased access to cessation therapies. For reasons that have not been adequately studied, the use of policy interventions such as sales taxes to reduce tobacco use is uneven around the globe. The most obvious constraint to tobacco control comes from the tobacco industry, which is well organized and well funded. But earmarking tobacco taxes for uses that the public will support can be a key political tool for effecting change. The World Health Organization's 2003 Framework Convention on Tobacco Control may also encourage signatory countries to implement appropriate measures.

Traffic injuries

Risk factors that increase the frequency and severity of road traffic injuries include greater traffic volume, increased speeds, consumption of alcohol, and the failure to wear helmets while operating two-wheeled vehicles. Preventive programs formed in conjunction with law enforcement and community organizations can reduce road traffic injuries through lowered speed limits, "speed bumps," police enforcement, and helmet laws, among other measures. Education, better laws and their enforcement, and engineering may all be potentially cost-effective. Research and development are needed to adapt successful programs from developed countries.

Tuberculosis

The cost-effectiveness of short-course drug therapy for TB has been central to the global promotion of directly observed treatment short course (DOTS) by the World Health Organization. However, the DOTS approach alone may not be sufficient to bring TB under control, and interest is growing in other methods, such as developing a more effective vaccine, treating latent TB infection, testing for TB drug resistance, treating HIV coinfection, and active case finding. It is not clear how money can be best allocated for TB control; although DOTS programs are a good value, their full cost may be greater in countries where a broader investment in the health sector is needed.

Vaccine-preventable diseases

Immunization program costs can be lowered by using the most efficient mix of delivery strategies, reducing vaccine waste, and reducing the number of doses required to achieve immunity. Targeted approaches also could yield high returns, especially in regions with poor control of vaccine-preventable diseases. In some countries, however, the challenge will be to sustain high immunization coverage in the face of community perception that vaccine-preventable diseases no longer constitute a major public health threat.

For more information…

The Disease Control Priorities Project is a collaborative effort of the World Bank, the Population Reference Bureau, the World Health Organization, the Fogarty International Center of the U.S. National Institutes of Health, and the Bill & Melinda Gates Foundation. For additional data and access to full-text versions of *Disease Control Priorities in Developing Countries, 2nd Edition,* and its companion volumes *Priorities in Health* and *Global Burden of Disease and Risk Factors,* visit www.dcp2.org.

Photos courtesy of National STD and AIDS Program of Brazil.

HIV: What You Know Can Help You

by Rogerio Waldrigues Galindo

Thanks to an innovative health campaign, more and more Brazilians are deciding that getting an HIV test is just the thing to do.

Imagine a man with a grand piano balanced on his shoulder. He carries it all day long, everywhere he goes. Occasionally, he passes other people carrying pianos, but he appears to feel all alone in his plight. Finally, his burden is lifted when he gets tested for HIV.

The images are from a public service announcement broadcast throughout Brazil as part of a Ministry of Health communication campaign known as Fique Sabendo, which translates loosely as "Be in the Know." Its message is simple: Anyone can get HIV. In addition to taking precautions, everyone who is sexually active should get tested. It's worth the effort; it's the only way to really *know*.

Launched in 2002, Fique Sabendo (pronounced "Feek-ee Sah-ben-doo") has been singled out by the Pan American Health Organization (PAHO) as worth replicating elsewhere in Latin America and the Caribbean, where some 1.8 million people are believed to be infected with HIV but only 600,000 (one in three) are aware of their status.

> Anyone can get HIV. Everyone who is sexually active should get tested.

PAHO has been working with its member countries throughout the region on initiatives to promote safe sex and increase access to antiretroviral drugs. More than 345,000 people in the region today are getting treatment, up 76 percent from just four years ago.

▲ Singer Wanessa Camargo (left) and TV talk-show host Angélica are among the top Brazilian celebrities recruited to promote HIV testing.

But people who don't know they are infected don't know they need these life-saving drugs. Worse, they can unwittingly pass the virus to others by having unprotected sex. The challenge is to get more people to get tested, both to boost prevention and to promote treatment for those who need it.

"If this campaign is as successful elsewhere as it has been in Brazil, it will save lives and make a fundamental difference to public health in entire countries," says Paulo Lyra, PAHO's top expert on social communication and HIV.

Testing is trendy

Studies show that people resist getting tested for HIV for a number of reasons. One is fear of the results. Another is fear of discrimination. The former has become less an obstacle as drugs have become available to halt the progression of HIV, so that the disease is no longer a death sentence. A number of public health initiatives have tackled the stigma associated with HIV, and Fique Sabendo is an extension of those efforts. Its aim is to make testing more common, something everyone who is sexually active should do.

Brazilian health authorities took a multipronged approach in developing the campaign. Its centerpiece is a logo that was chosen as part of a contest sponsored by the Ministry of Health. The winning design, submitted by a 22-year-old college student, was a stylized smiley face with plus and minus signs for eyes. The logo premiered during the 2004 São Paulo Fashion Week, at a show in which dozens of svelte models wore cropped T-shirts sporting the winking smiley face.

"An important factor was that the logo be associated with modernity and with attitude," says Emivaldo

People who don't know they are infected don't know they need life-saving drugs.

"Zinho" Souza Filho, publicity coordinator for Brazil's National STD and AIDS Program. "That's why we tried to tie it into the concept of fashion."

A number of popular television actors joined the campaign, and the minister of health at the time, Humberto Costa, was photographed having his blood drawn for testing. The piano-themed public service announcements included a voice-over explaining why it's important to take the test. The campaign also flooded the country with print ads.

By now, Fique Sabendo's logo has become a familiar fixture in Brazilian culture. And the campaign produced tangible results. According to a March 2004 survey, 26 percent of sexually active Brazilians said they had taken an HIV test at least once in their lives; of these, nearly half were tested in 2003 and 2004, during the Fique Sabendo campaign. During the same period, the number of people seeking tests at government testing centers was up 53 percent.

Given Brazil's success, PAHO is hoping other countries in Latin America and the Caribbean will follow suit and launch their own know-your-HIV-status campaigns. Already, a handful have done so, including Belize, El Salvador, Mexico, and Trinidad and Tobago. To encourage others, PAHO is adapting elements of Fique Sabendo for use in English- and Spanish-speaking countries.

▲ Grand pianos symbolize the emotional weight of not knowing one's HIV status in a series of public service announcements aired on Brazilian TV.

Photo © Rodolfo Bührer

"In Spanish, we're calling the initiative Hazte la Prueba," says Lyra. "It's much more than just an advertising campaign."

Hazte la Prueba, Spanish for "Get Yourself Tested," was previewed last November in El Salvador at a meeting of the Inter-American Commission of Women. The campaign uses materials developed by PAHO based on the Fique Sabendo logo. Other countries in Central America, where HIV rates are among the hemisphere's highest, have expressed interest in the campaign, and PAHO is discussing English-language versions with several Caribbean countries.

A major incentive for countries to jump on the know-your-status bandwagon is the low cost involved. The Fique Sabendo logo is royalty-free, celebrities can be recruited to make pro bono appearances in the campaign, and television and radio stations will usually broadcast public service spots at no charge. Campaigns can also use new media, including portable media players and text messaging on cellular phones. In addition, PAHO is producing traditional print materials, including posters and brochures, which will be available in English and Spanish for download for free from the PAHO website.

Higher demand

For many countries, being able to offer an HIV test to anyone who wants it was, until recently, a challenge. The newer challenge, says Lyra, "is to create demand, to make an HIV test as common as—or commoner than—a cholesterol check."

Brazilian health authorities caution that countries that decide to emulate their campaign must prepare for the significant increase in demand for testing services. This will require additional blood-collection equipment and more personnel, particularly health care workers trained in HIV testing and counseling. Lyra says a fundamental challenge of each cam-

▲ Brazilian soccer star Kaká (left) sports a Fique Sabendo T-shirt, and (right) a health worker performs a blood screening test for HIV.

The challenge is to make an HIV test as common as a cholesterol check.

paign will be to guarantee that anyone who wants to know their HIV status will be able to get not just a test but the essential health services that should go with it, including antiretroviral drugs.

Given these challenges, PAHO recommends that countries with focalized epidemics expand testing and counseling services for their most vulnerable groups before promoting them among the general population. Countries with generalized epidemics should promote these services among both high-risk groups and the population at large.

For Brazil, Fique Sabendo is just one of a long series of groundbreaking efforts to battle HIV, from the country's 20-year-old internationally renowned National STD and AIDS Program to the government's 10-year-old policy of providing universal access to free antiretroviral drugs.

Social communication campaigns have been an integral part of these efforts. More recently, Brazil's Ministry of Health has carried out two more targeted campaigns, one directed at health care professionals and another aimed at pregnant women.

"The goal is to reduce mother-to-child transmission to less than 1 percent and congenital syphilis to zero," says Alexandre Magno, communication advisor in Brazil's National STD and AIDS Program.

But for Magno and his colleagues, the challenge of keeping all Brazilians alert to the threat of HIV is an ongoing one: "Now we need to get back to talking about the test for the general population."

Rogerio Waldrigues Galindo is a Brazilian journalist who lives in Curitiba.

▲ Lucélia Santos, a popular Brazilian actress and filmmaker, signs a thumbs-up for HIV testing.

Deadly Imitations

by Matías Loewy

Counterfeit drugs are a growing global enterprise and a major threat to health in both the developed and the developing world.

In December 2004, 22-year-old Veronica Díaz went to a local hospital in the Patagonian province of Río Negro to get her seventh shot of Yectafer, an injectable iron supplement she had been prescribed for anemia. The medical tragedy that ensued sent shock waves across Argentina.

The injection produced liver damage so severe that Díaz required a liver transplant. She died on Dec. 23, 2004, before the operation could take place. At least eight other women were hospitalized in the same region with similar adverse reactions, and a second fatal case was reported in the province of Entre Ríos.

"I think my hair turned white that day," recalls José Blanc, then technical director of the local subsidiary of AstraZeneca, Yectafer's manufacturer. He was convinced from the start that the lethal drug could not have come from his laboratory, since each lot went through no fewer than 50 quality checks before being released into distribution. The product had been on the market for 40 years, with more than 20 million doses administered in Argentina alone.

"Nothing like this had ever happened before," said Blanc, now AstraZeneca's director of quality control for Latin America and the Caribbean.

Argentine health authorities retrieved samples of the suspicious product and sent them to Buenos Aires for analysis. When Blanc saw the samples, he says it took him "less than 30 seconds" to confirm his suspicions that the drug was fake. The lot number and expiration date were printed in the wrong place, and the name was printed in the wrong size font. The maroon-colored liquid inside was

Sixty percent of counterfeit drugs are found in the developing world, where they represent up to 30 percent of the total pharmaceutical market.

a different shade from the original drug.

Subsequent analysis showed that instead of iron sorbitol, the active ingredient in legitimate Yectafer, the counterfeit ampules contained another iron derivative in a concentration three times as high as in the original. Authorities managed to identify and prosecute several members of the counterfeit drug's distribution chain. But those who actually produced the drug were never caught.

More than a year after Veronica Díaz's death, Blanc's sense of indignation toward those responsible has not diminished. "Even if they don't mean to kill people, they're true criminals," he says.

Global scourge

The manufacture, distribution, and marketing of counterfeit drugs have become a lucrative and growing business worldwide. The problem is most serious in countries where regulatory oversight and law enforcement are weak. In most industrialized countries, counterfeit drugs amount to less than 1 percent of the total market in pharmaceuticals. But in many countries of Africa, Asia, and Latin America they are believed to represent 10–30 percent of the total drug market.

"Obviously it must be a very lucrative activity for counterfeiters to go to so much trouble," says Adrián Giménez, a Buenos Aires prosecutor whose unit has handled more than 400 cases of counterfeit drugs since 1997.

Despite its growth, counterfeiting has remained a relatively low-profile crime. Since counterfeit drugs are generally difficult to detect, reporting on the problem is erratic. Legitimate pharmaceutical manufacturers cooperate with one another in collecting data on known cases. But "in the past they were reluctant to share information publicly or to sound the alarm too loudly, because that could undermine public confidence in legitimate medicines," says Rosario D'Alessio, regional advisor for medicine and pharmaceuticals at the Pan American Health Organization (PAHO).

Now, "that is changing—the fight against counterfeiting is intensifying with the support of the pharmaceutical industry," D'Alessio says.

Marcelo Peretta, vice president of the Federal Capital Association of Pharmacists and Biochemists in Buenos Aires, believes that the low-profile nature of counterfeiting may be part of its draw for criminals.

"Making counterfeit drugs is more appealing than trafficking in cocaine or other illegal drugs because counterfeiters are not pursued as aggressively and they're part of a circuit in which they can launder their money faster," Peretta says.

Counterfeit drugs have produced tragic consequences across the globe. In 1995 in Niger, 2,500 people died after receiving a counterfeit meningitis vaccine. In Haiti the same year, 89 people died after taking a cough syrup that contained diethylene glycol, a toxic chemical used in antifreeze. Three years later, the same cough syrup killed 30 infants in India.

According to the World Health Organization (WHO), 60 percent of counterfeit drugs are found in developing countries. A high proportion of the fakes are drugs used to treat malaria, HIV/AIDS, and other diseases that disproportionately affect the developing world. A study in WHO's Southeast Asia Region showed that 38 percent of the 104 antimalarial drugs

▲ A key challenge in the fight against counterfeiting is to develop systems that can trace medications through all the stages of the drug chain.

on sale in pharmacies contained no active ingredients at all.

But any drug can inspire imitators, and no country is exempt from risk. In March 2005, investigators discovered an international network that was manufacturing fake tablets of Lipitor (a cholesterol reducer) in Costa Rica for shipment to the United States, where they would have sold for some $8 million. Pills for erectile dysfunction, often sold over the Internet, are also a favorite target for counterfeiters. Indeed, medicines purchased over the Internet from sites that conceal their physical addresses have been found to be counterfeit in more than half of cases.

"The problem is growing," says D'Alessio. "There's local production, but there's also international traffic in counterfeit drugs. The fact is that counterfeiting of drugs is globalized."

Criminal effects

In many cases, counterfeiters produce nearly exact replicas of a legitimate drug, copying every detail from the form—pill, cream, syrup, or injectable solution—to the packaging and labeling. A recent study in *The Lancet* medical journal concluded that counterfeiters' abilities to imitate holograms and other sophisticated printing techniques had improved dramatically between 2001 and 2005, making detection even more difficult.

Counterfeit products may contain the correct or wrong ingredients, some or no active ingredients, or substitutions that may be benign, toxic, or lethal. In other instances, criminals may steal legitimate pharmaceutical products and later reintroduce them into distribution, with no guarantees they have been properly transported or stored. In some cases, the expiration date is changed to "lengthen" a drug's shelf life. Investigators have found that the distribution channels of stolen medicines are very similar to those of illegally manufactured drugs.

One of the most complex aspects of the problem is that, unlike the false Yectafer, many counterfeit drugs do not produce harm that is immediately apparent. Their lack of therapeutic effect may be confused with the natural evolution of an illness or with a patient's particular response to treatment, rather than identified as the result of ineffective medicine.

"In general, they may not kill, but they have no effect," explains D'Alessio.

Regular use of such medications can lead to drug resistance, therapeutic failure, or even death. In 1999, at least 30 Cambodians died after taking counterfeit antimalarial drugs that

In the PAHO region

According to recent reports, drug counterfeiting is growing in the Americas and around the world even as efforts to address the crime are increasing. Here are examples of recent developments in member countries of the Pan American Health Organization (PAHO):

- **The Association of Colombian Pharmaceutical Industries estimates that in 2004, $60 million worth of medicines—5 percent of all drugs sold—were contraband, counterfeit, or adulterated.**
- **In the Dominican Republic, about half of all pharmacies operate illegally, and 10 percent of medicines imported in 2005 were fake, according to the Ministry of Public Health. Some confiscated medicines had expired more than 10 years earlier.**
- **El Salvador's Association of Pharmaceutical Companies reports that counterfeit drugs are widely available on the domestic market. According to a local manufacturer, Gamma Laboratories, fake drugs generated some $40 million in losses to El Salvador's pharmaceutical industry in 2005.**
- **Mexican federal agents seized 60 tons of stolen, expired, and counterfeit pharmaceuticals in just two states, Michoacán and Jalisco, in 2004. Reports indicate that illegal products represent about 10 percent of the pharmaceutical market nationally.**
- **In Peru, the sale of counterfeit drugs rose from an estimated $40 million in 2002 to $66 million in 2006, according to the Association of Pharmaceutical Laboratories of Peru. In Lima alone, the number of illegal pharmacies selling counterfeit medicines has increased from about 200 in 2002 to 1,800 today. Peru's General Directorate of Medicines, Supplies and Drugs seized some 460,000 counterfeit or expired medicines in 2005.**

Counterfeiters have dramatically improved their ability to imitate holograms and other printing techniques, making detection of fake products more difficult.

contained sulfadoxine-pyrimethamine (an older, less effective antimalarial) but that were sold as the newer, more effective artesunate.

The scope of the problem is difficult to assess because weaknesses in national drug surveillance programs make it hard to collect information, much less take action, on ineffective drugs. In 1997, Argentine authorities discovered several fake lots of Madopar, a medication for Parkinson's disease. When patients took the pills, their symptoms—trembling, stiffness, or slow movements—got worse.

"I am convinced that fake Madopar must have caused some deaths that simply went undetected," said Giménez, who investigated the case.

International battle

Countries around the world have responded to this growing global threat by stepping up efforts to detect, trace, and prosecute cases of drug counterfeiting. In 2001, Brazil's National Health Surveillance Agency (ANVISA) and PAHO carried out a survey to assess efforts to address the problem in Latin America and the Caribbean.

The responses to the survey—received from 15 of 23 countries approached—revealed serious shortcomings in countries' abilities to fight drug counterfeiting. Problems included an absence of national standards or guidance for the distribution and dispensing of medicines, a lack of formal structures for preventing and fighting this type of crime, and a lack of information for the public about counterfeit drugs known to be in circulation.

The results of the ANVISA-PAHO survey were presented in December 2001 at the founding meeting of the Working Group to Combat Drug Counterfeiting (WG/CDC). The group, coordinated by PAHO and made up of regulatory authorities and industry representatives from throughout the region, has met twice since then, most recently during the Fourth Pan American Conference on Drug Regulatory Harmonization in the Dominican Republic in March 2005. The group has also sponsored regional training workshops.

The WG/CDC has developed a series of recommendations for fighting counterfeiters. The group urges regulatory authorities to implement national programs for prevention and control that have defined plans of action, schemes for tracking drugs through the supply chain, policies on communicating the risks to the public, and the formation of networks to facilitate information dissemination and cooperation between various countries of the region.

▲ Counterfeit drugs sometimes reach market through legitimate distributors who fail to use the proper controls.

Labs in henhouses

Officials who investigate counterfeit drug cases say the job is full of surprises.

"In most cases, you find clandestine labs in simple sheds without any external identification," says Adrián Giménez, one of Argentina's most experienced investigators of counterfeit drugs. "But we also discovered a band of counterfeiters who were producing adulterated asthma medication inside a hen house."

In recent years, Giménez says, investigators have received a growing number of leads from doctors and other health professionals, who are becoming more alert to the problem. This was what happened in two recent cases involving counterfeit cancer drugs.

"One of them had no active ingredients, and the other was way past the expiration date and had been transferred to a new container," Gimenez says.

In both cases, it was doctors who noted something strange in the products' appearance and alerted authorities.

Medicines purchased over the Internet from sites that conceal their physical addresses have been found to be counterfeit in more than half of cases.

The group also recommends that every country's ministry of health establish an "executing unit" made up of pharmaceutical inspectors, lawyers, and intelligence personnel to monitor the quality and safety of available drugs.

"Some of the recommendations can be implemented immediately, and others—like setting up executing units—will take more time," says D'Alessio. "But all the countries agreed to take action, in some cases starting by designating specialized teams within the ministries. This will facilitate regional exchange of information."

Critical measures

For pharmacist Peretta, who believes that about 10 percent of medications circulating in Argentina are fake or stolen, the real key to fighting these crimes is being able to trace the origin of any suspicious medication. One of the recommendations of the WG/CDC is that regulatory authorities should "have mechanisms and technologies to trace drugs effectively in the different stages of the drug chain (from production to dispensing), including lot numbers in purchase and sale documents (invoice, receipts, etc.)."

The experts also proposed that retail drug sales to the public be limited to pharmacies. "You can't have medications being sold by street vendors," agrees D'Alessio.

At the same time, legislation needs to be updated to address this type of crime. In Argentina, for example, it is not a crime to change the expiration date on a drug unless it is proven that doing so damaged someone's health.

In the 1949 film classic *The Third Man*, Orson Wells plays an infamous villain who tries to become a millionaire by trafficking in adulterated penicillin. Half a century later, reality has surpassed fiction, and authorities are struggling to reverse what has become a growing global trend.

"This has to be a coordinated effort, because with counterfeit drugs, everyone loses: the industry, patients, health professionals.... The only ones who win are the counterfeiters," D'Alessio complains.

She also believes that regulatory authorities are becoming more aware of the problem, and most are committed to implementing more effective sanctions.

"We can't let down our guard," she warns. "Drug counterfeiters are like a metastatic cancer that attacks in one place and then shows up in another. You can't just catch some of them and punish them and then assume that you're home free."

Matías Loewy writes on science and health for Noticias *magazine in Argentina.*

New global crackdown

The World Health Organization (WHO) is intensifying the war on drug counterfeiting with a new global task force that links the efforts of government and international agencies as well as the public.

Announced last September, IMPACT (International Medical Products Anti-Counterfeiting Taskforce) will enlist consumers, drug distributors, pharmacists, and hospital staff to help identify cases of counterfeit drugs.

IMPACT will start by looking at existing laws on drug counterfeiting and advising WHO member governments on how to strengthen those laws. The group will then target the corruption that keeps such laws from being enforced.

"We want to explain to corrupt officers that they should not accept bribes because the fake drugs they let through could end up poisoning their own families," says Valerio Reggi, of WHO's Health Technology and Pharmaceuticals program and coordinator of IMPACT.

Some of the task force's key challenges will be persuading consumers and health care providers to report suspicious products, getting legitimate drug manufacturers to make their products more difficult to fake, and improving the traceability of pharmaceuticals.

To make medications easier to trace, the task force will work with government agencies and manufacturers to create a product database and tracking system that uses widely available and relatively inexpensive technology. Producers will label each bottle or packet of medicine with a unique number, making it possible to check a drug at any point in the distribution pipeline and determine whether it is genuine.

The task force will include national regulatory authorities, law enforcement agencies, nongovernmental organizations, other international organizations, associations of pharmaceutical manufacturers and wholesalers, patient advocacy groups, and health care professionals.

Meanwhile, WHO is exploring the possibility of promoting an international accord —similar to the Framework Convention on Tobacco Control—or some other global cooperation mechanism that can catalyze wide-reaching international action against drug counterfeiting.

Back in the sixties when he was a student leader at the University of Buenos Aires, Victor Penchaszadeh had no idea that the famous DNA spiral discovered by James Watson just a decade earlier would become the cornerstone of his own professional life. But had he known, he might have guessed that his personal mission would one day be to combine genetics with social medicine and the promotion of health as a human right.

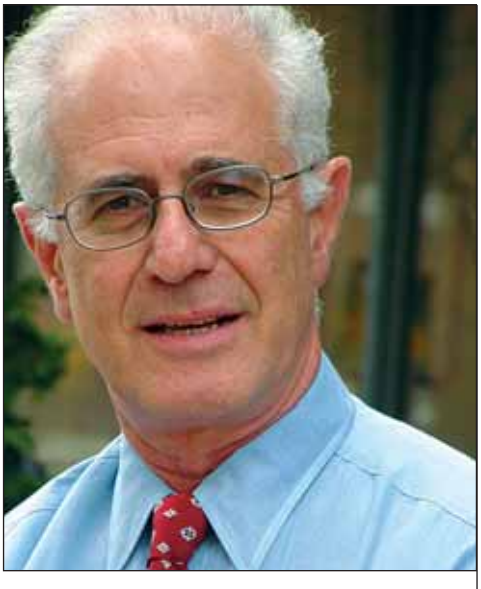
Today, at the pinnacle of a 40-year career that has spanned pediatrics, epidemiology, and bioethics as well as genetics, Penchaszadeh is adamant in his belief that the benefits of the genomics revolution should not be a luxury for the rich but instead be within everyone's reach.

"Genetics may seem secondary to a society's basic needs, but it really

Genetics in the Service of the People

by Paula Andaló

Advances in genomics can—and should—lead to progress in public health.



needs to be integrated into general health services," he says.

To promote this idea, Penchaszadeh teamed up in 1996 with the Pan American Health Organization and the World Health Organization to establish the PAHO/WHO Collaborating Center on Community Genetics at the Mailman School of Public Health at Columbia University in New York. Now, a decade later, he has returned to his native Argentina to start a regional program on Medical Genetics and Public Health, housed at PAHO's country office in Buenos Aires. The program will help Latin American and Caribbean countries assess the safety and effectiveness of new genetic technologies and will produce policy documents on technical and bioethical issues related to genetics, health, and human rights.

Not just testing

For Penchaszadeh, genetic services are a public health tool that must be put at the service of the people. The reasons are simple and practical: knowing that someone has, or is predisposed to, a given illness or condition can help them avert the most serious consequences of that illness. Many genetically determined conditions are preventable or at least benefit from early treatment. And today, "there are at least 1,000 disorders that can be diagnosed through DNA analysis, either in an affected individual or through a prenatal test in early pregnancy," notes Penchaszadeh.

Many of these conditions can have an impact on collective health, in both rich and poorer countries. Examples include sickle cell disease, which is common in Cuba, and Huntington's disease, which has unusually high incidence in the Lake Maracaibo region of Venezuela (see sidebar p. 25).

But the link between genetic services and public health is not always appreciated, says Penchaszadeh. "The countries that have managed to have an impact on these diseases have acted at the level of primary health care, using effective prevention technologies," he observes.

▲ Argentine geneticist Victor Penchaszadeh.

Reclaiming lost identities

Photo courtesy of Télam

▲ Genetic testing has helped Grandmothers of the Plaza de Mayo identify dozens of their long-lost grandchildren.

Victor Penchaszadeh has helped pioneer the use of genetic testing in recovering lost identity through his efforts to identify children illegally taken from captive birth mothers during Argentina's period of military dictatorship.

From 1976 to 1983, hundreds of Argentine women suspected of being leftists were kidnapped and taken to clandestine prisons. Many who were pregnant were killed after giving birth and their babies turned over to military families or others sympathetic to the military regime. The organization Grandmothers of the Plaza de Mayo estimates that some 250 or more children were illegally adopted in this manner.

With the return to democracy, former Argentine president Raúl Alfonsín formed a commission to investigate these and other human right abuses during the military era, and efforts to recover disappeared children intensified.

Acting on Penchaszadeh's recommendations, the Department of Health of the city of Buenos Aires set up a genetics laboratory at Durand General Hospital, which would later become the National Genetics Data Base. Its task was to collect and analyze genetic information to help establish the true identities of hundreds of young people whose biological parents had been victims of the military regime.

So far, around 90 young adults have been positively identified as among the babies who were "appropriated" from biological mothers killed in captivity. But the work of tracking these unknowing victims goes on, spurred in large part by the Grandmothers of the Plaza de Mayo, for whom Penchaszadeh serves as advisor. The grandmothers believe that as their lost grandchildren get older, more will come forward and be willing to confront the painful truth: that they may have been raised by people who had a direct or indirect hand in the torture and assassination of their true parents.

To serve public health, he explains, genetic services must consist of more than testing; they must encompass diagnosis, treatment, follow-up, and counseling of patients at risk or suffering from genetic conditions.

In practice, genetic services have developed erratically in Latin America and the Caribbean over the past decade. In nearly all the region's countries, genetic services are heavily concentrated in cities and promoted more by individual providers than by government health authorities motivated by public health concerns. This situation promotes inequity at the level of individual care, says Penchaszadeh, since access to genetic services is effectively limited to patients with money. It also skews the focus of genetic services.

> "Genetics may seem secondary to a society's basic needs, but it really needs to be integrated into general health services."
>
> —Victor Penchaszadeh

"It runs the risk that genetic services can end up limited to private health care, with a focus on expensive procedures like chromosome analysis, prenatal diagnostics, and paternity testing"—and with little attention to prevention and follow-up.

Penchaszadeh says a singular exception to this trend is Cuba, where "genetic services were incorporated into basic health services from the beginning, with clear community objectives."

Meanwhile, in some countries of the region, clinical genetics does not yet exist as a medical specialty.

Seeking support

There are a number of barriers to further progress. Chief among them is the region's more obvious need to deal with priorities such as infectious and nutrition-related diseases, which makes it harder to view genetics as a primary health tool. And there are widely held misconceptions about genetics: for example, that it is inherently expensive and deals only with rare and exotic diseases, or that its preventive value is linked to pregnancy termination, which remains illegal in most countries of Latin America.

Penchaszadeh counters the latter by arguing: "Genetics has an underappreciated preventive value. How many neural tube defects could be prevented if we promoted consumption of folic acid during pregnancy?"

Despite the economic and cultural obstacles, there are today in Latin America some 500 doctors specializing in clinical genetics and providing a range of services to patients. At the academic level, there are formal training programs in medical genetics in Argentina, Brazil, Chile, Cuba, and Mexico. In addition, many of the region's countries have professional associations linking experts in the field, and recently the Latin American Network of Human Genetics (RELAGH) became the region's representative organization to the Inter-

At least 1,000 inherited disorders are now detectable through genetic testing. Knowing one has or is predisposed to one of these illnesses can help avert its most serious effects.

national Society of Human Genetics Societies.

"Official support for these initiatives is crucial to put them in a framework of equity and accessibility in order for them to have a real impact on public health," says Penchaszadeh.

Government support is important for another reason. If genetic services are endorsed by governments, this guarantees some regulation, not only of procedures but of the uses of genetic information collected on patients. The issue goes beyond patient confidentiality into the realm of bioethics. "We mustn't forget that under the guise of genetics, people have embraced dangerous theories about genetic determinism and racial superiority," says Penchaszadeh.

He adds that there is the risk that, in the interest of prevention, genetics programs can undermine reproductive rights and increase discrimination against people with disabilities. To prevent such problems, WHO includes a strong bioethical component in all its programs for prevention and treatment of genetic diseases.

For Penchaszadeh, a key task is deciding which tools and methods are most efficient at the population level, for not only detection but also prevention of genetic disorders. Primary prevention of neural tube defects, for example, is a simple—if not yet routine—matter of fortifying diets with folic acid. Even Down syndrome can be prevented, by raising awareness about the impact of maternal age and discouraging childbearing among older women. Yet despite this, "in practice, programs on Down syndrome are mostly limited to screening of high-risk pregnancies using fetal chromosome analysis, after which there are two choices: continuing or interrupting the pregnancy," says Penchaszadeh. That presents parents with a dilemma that has not only moral but also—in most of the region's countries—legal implications.

At home in Buenos Aires, where he recently resettled after 25 years in the United States, Penchaszadeh insists that genetics is today at a crossroads. Its supporters must clearly define the ethical framework and the appropriate applications of genetics if they hope to move forward.

The challenge is twofold, he says: "to accelerate research on preventive and therapeutic applications of knowledge derived from genomics, and to ensure that these benefits are accessible to the population as a whole."

Paula Andaló is an Argentine journalist and former staff member of the Pan American Health Organization's Office of Public Information.

Founders and clusters

There are some 4,000 known genetic disorders, and "virtually all of them exist in Latin America," says Victor Penchaszadeh. Some of the most common include Down syndrome, cystic fibrosis, muscular dystrophy, hemophilia, sickle cell disease, Tay sachs disease, fragile X syndrome, and Huntington's disease.

Many genetic disorders show up with greater frequency in specific population groups. Sickle cell disease, for example, is found most commonly in Africa and among Afro-descendants in the United States, the Caribbean Islands, South America's Atlantic coast, and Brazil. Other genetic disorders that "cluster" in Latin America include the following:

- **Huntington's disease, a neurologically degenerative disorder that affects an unusually high proportion of people living in Venezuela's Lake Maracaibo region.**
- **Machado–Joseph disease, a form of spinocerebellar ataxia (with effects similar to Huntington's disease), that appears primarily in people of Portuguese-Azorean descent and is found with high frequency in southern Brazil.**
- **Holguín ataxia, named after the province in Cuba where the highest incidence of this disease is found.**
- **Albinism, which has unusually high incidence in Argentina's La Rioja region.**
- **Acheiropodia, which consists of congenitally amputated hands and feet, and has been found almost exclusively in Brazil.**

Photo by Steve Uzzell

▲ Members of this family from Laguneta, Venezuela, near Lake Maracaibo, are at high risk of Huntington's disease, a rare genetic disorder that is found in an unusually high number of residents of this area. The DNA of the boy in the white shirt helped researchers identify the gene that causes the disease.

Scientists believe that most clusters of this type are the result of what is known as the "founder effect," in which a small group of migrants settle a new area. If for geographical or cultural reasons their progeny tend to marry within the group, their descendants' genetic diversity will eventually decline, and any genetic disorders carried by the founders will appear more frequently in succeeding generations.

Health Goes to School

by Marcelo Riccardi Doria

Photo © Rodolfo Bührer

In Colombia and throughout the Americas, health-promoting schools are launching children on a life-long quest for better health and quality of life.

At La Esperanza, a small rural school in the community of La Mesa, in central Colombia, a clutch of baby chicks recently served as the raw material for an unlikely educational exercise. At the beginning of the school year, teachers asked students to team up in couples and assume the responsibility of raising and caring for the little birds.

The results were mixed. Some of the more unruly chicks ran away, some fell ill, and others, sadly, were abandoned by their adoptive parents. It wasn't easy for the students either. Many of the couples broke up, others went "bankrupt," and many of the girls ended up as "single mothers." Indeed, the experiences ran the gamut of true-life parental vicissitudes.

If the purpose of the hands-on project was to teach lessons about subjects such as marital relations, family finances, and interpersonal relationships, it certainly seemed to have an impact. According to Johana Cortés, one of the girls involved in the project, "The teachers were affected, the students were affected, and the chicks were affected, too!"

Similar educational experiments have been popping up in public schools in Colombia and throughout Latin America and the Caribbean. Children are learning healthy habits in interesting and original ways, improving their diets and increasing their physical activity, building self-esteem and avoiding risky behaviors, and helping to improve living conditions in their communities by participating in "ecology days" and recycling programs. It's all part of an approach known popularly as "healthy schools," which has spread to a growing number of countries over the past decade.

"The idea is to promote health and development in the context of children's daily lives. And, of course, for children that means at school," says Josefa Ippolito-Shepherd, regional advisor on health promotion and health education at the Pan American Health Organization (PAHO). "The goal is for children themselves to become central actors in their own lifelong pursuit of good health and a better life, not just for themselves but for their families and communities."

Flexible strategy

The Regional Health-Promoting Schools Initiative was officially launched by PAHO in 1995 as an effort to make health—in the broadest sense of the term—an integral part of education. The initiative promotes conditions conducive to learning healthy habits and better quality of life for children, teachers, administrators, and parents, with spillover effects that benefit the entire community.

Two years after the official launch, Colombia's Ministry of Health signed on to the PAHO initiative, committing itself to nationwide implementation. But this would require the involvement of more than just the health sector, and thus began a long process of consultations among the ministries of health and education, the Colombian Institute of Family Welfare, and PAHO. Two years later, the result was a national strategy titled "Healthy Schools: The Joy of Living in Peace." It outlined a standard set of concepts, an operational plan with responsibilities for each sector, and a set of indicators for measuring progress in implementation. The strategy set a goal of getting 80 percent of local school districts on board within six or seven years.

In practice, the healthy schools strategy means different things in different settings. In general it promotes activities in three main areas: life skills education; healthy and supportive environments; and nutrition, physical activity, and essential health services (see sidebar).

How these areas are addressed varies from school to school. The chickens at La Esperanza, for example, were a hands-on experiment aimed at teaching practical lessons about family life and sexual and reproductive health. Luz Marina Caicedo, the school's academic coordinator, notes that it was just one of many healthy schools activities carried out throughout the year. "At our school we celebrate World Health Day, hold clean-up days, do eco-walks and time management projects, and play school sports," she says.

Activities like these complement longer-term efforts such as incorporating health themes into school curricula and making improvements in school facilities, which can range from installing running water or building a simple latrine to planting trees and shrubs or even vegetable gardens.

One of the strengths of the healthy schools strategy is its flexibility. It offers general lines of action, technical guidance, and suggestions on how to spend resources. But it doesn't tell anyone exactly what to do. Instead, the strategy leaves space for participation, creativity, and local initiatives to address the particular problems of each community.

This has led to widely varied initiatives. In Ubaté, a town 100 kilometers northeast of Bogotá, one of the first things school officials did was to hang mirrors on the school walls. They found that when the children—mostly from remote rural villages—saw themselves in the mirrors, they began to take more interest in their personal hygiene and appearance. The school also decided to offer classes for parents and caregivers to make sure that the healthy habits they were pro-

Building blocks for a healthy school

There is no set formula for creating a health-promoting school, but there are a number of key principles that should guide the process. According to the Pan American Health Organization's Regional Health-Promoting Schools Initiative, every healthy school should:

- **Involve everyone—from teachers, students, and parents to community leaders and health workers—in decision-making and activities.**
- **Offer integrated health education, including life skills training to reinforce healthy behaviors and reduce risk factors.**
- **Provide a safe, caring, and healthy environment, with clean water and sanitation, smoke-free air, and freedom from drugs, violence, and physical or emotional abuse.**
- **Provide teachers with relevant training and materials.**
- **Facilitate access to health services, counseling, good nutrition, and physical activity.**
- **Promote values of mutual respect, gender equality, and individual and collective well-being.**
- **Work to improve the health of the entire community.**

Photo © Marcelo Riccardi Doria

▲ A girl checks her weight as part of her school's efforts to promote healthy lifestyles.

Photos © Marcelo Ricardi Doria

PAHO

moting among children would be reinforced, not undermined, at home.

Resources

Activities like these, of course, require money. Colombia's Ministry of Health directly funded the early development of the health-promoting schools initiative and continues to provide support through annual budget allocations to various regions. However, no region is obligated to spend its budgetary resources on healthy schools.

This could leave the initiative in a weak position. But some promoters say the opposite is true. According to Mayden Cardona, national coordinator for Colombia's health-promoting schools, regional and local officials fully recognize the program's value.

"Healthy schools has been well received because it has truly helped promote health and disease prevention in the school community—among kids, teachers and parents," she says.

In cases where local authorities have not assigned funds for the strategy, schools have managed to find their own resources. At La Esperanza, supporters have organized collection drives to purchase trash bins, raffles to buy tape recorders, and movie presentations to finance teaching materials. Sometimes teachers use their own money to buy what they need, as was the case in the baby chick experiment.

In Ubaté, healthy schools advocates expect to receive funding to support their efforts starting in early 2007. In the meantime, they have been actively implementing the strategy in eight local schools over the past year. Cooperation from members of the community has helped

▲ Health-promoting schools strive to provide healthy environments where children can grow and develop physically, emotionally, and intellectually.

From checkups to life skills

Before the mid-1990s, school health programs in Latin America and the Caribbean were focused on improving hygiene and sanitary conditions, preventing communicable diseases, treating illnesses, and providing periodic medical checkups and screening.

"The early programs were important for child and community health, but they didn't go far enough," says Josefa Ippolito-Shepherd, regional advisor on health education and health promotion for the Pan American Health Organization (PAHO). The Regional Health-Promoting Schools Initiative, launched by PAHO in 1995, significantly broadens the concept of health promotion in schools.

"It takes a comprehensive, multidisciplinary approach to promoting health and development in children and adolescents, and health in the community at large," says Ippolito-Shepherd.

A year after the initiative's launch, at a meeting organized by PAHO in San José, Costa Rica, 11 countries got together and formed the Latin American Network of Health-Promoting Schools. In 2001, the countries of the Caribbean launched their own network with 14 member countries. Today all the region's countries have signed on to the health-promoting schools initiative, with tens of thousands of participating schools.

PAHO has continued to provide support for their efforts through technical cooperation focused on raising awareness among policymakers, forging partnerships across different sectors, analyzing and updating policies and legislation, sponsoring regional meetings and training activities, and assisting with program development, implementation, and evaluation.

The challenge ahead, says Ippolito-Shepherd, is to get society as a whole on board: "Our success and sustainability will depend in large part on the level of commitment in the countries and how well the different sectors can play a leadership role. We need to encourage community leaders, decision-makers, and other influential people to become advocates for the initiative, so we can increase our visibility and mobilize public support and resources."

make up for the delay in getting resources. The local Municipal Agency for Agrarian Technical Assistance has donated trees for school ecology projects, the city dump has hosted student visits to teach about recycling, and a local doctor has volunteered to provide medical checkups for students, to name just three examples.

Patricia Segurado, environmental health advisor in PAHO's country office in Bogotá, notes that the healthy schools strategy sees children themselves as important actors in making things happen.

"Children can become agents of change," she says. "They can bring members of the community together to work for the common good. And joint action by communities and institutions leads to a better society."

PAHO's Ippolito-Shepherd adds: "Clearly, the driving force at the local level is the people who are committed to the idea of building healthy schools. But there also needs to be leadership at the national level and resources to support technical cooperation and to expand the strategy's scope."

Colombia's experience has born out both these ideas. In 2002, the Ministry of Health counted 1,248 schools that were implementing the strategy. Then came a major restructuring of the public sector, which meant the elimination of some ministries, major changes in others, and a redistribution of functions across the board. That process took about a year.

For health-promoting schools, "it was a quiet year," recalls Cardona, "mainly because it wasn't clear who would take over the program." Coordination and follow-up at the national level virtually disappeared, she says.

Then in 2003, Cardona was named national coordinator of the strategy and began to renew her regional contacts and evaluate the status of the program. She says she was surprised to find that the number of healthy schools had not declined; municipalities had continued to assign resources to the program, and in general the strategy had kept going on its own.

From her office at the new Ministry of Social Protection, Cardona began

Healthy initiatives

Every country in Latin America and the Caribbean has signed on to the Pan American Health Organization's (PAHO) Regional Health-Promoting Schools Initiative. Different countries—and different regions within the same country—have taken different approaches to implementing the initiative. Below are a few examples.

- **Argentina's Salta province has been promoting healthy schools since 1998 through training of multidisciplinary teams and through networks linking various government ministries.**
- **Bolivia has focused efforts on sexual and reproductive education, using a gender perspective. Some 177 schools have joined the program, representing 1,400 teachers and 60,000 students.**
- **Chile's healthy schools efforts have included training programs for educators in nutrition, oral health, reduction of tobacco use, and increased physical activity.**
- **Cuba was one of the first countries in the region to adopt the healthy schools approach. As of 2005, 2,000 Cuban schools and 22 universities were implementing the strategy.**
- **El Salvador has focused much of its healthy schools efforts on nutrition. In 2005, 750,000 students benefited from the strategy; more than 360,000 received free nutritional snacks.**
- **In Mexico, health-promoting schools have developed alongside training programs and awareness-raising on environmental conservation.**
- **In Peru, a "Healthy Playgrounds" initiative has combined health promotion with recreation in the departments of Lima, Ayacucho, and Cusco. Schools throughout the country are incorporating health themes into their curricula, promoting personal hygiene, improving school environments, and training teachers.**
- **The Venezuelan state of Aragua has established minimum standards for certification of health-promoting schools, with emphasis on nutrition, oral health, and teacher training.**

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to reach out to both old and new partners at the national level. The result was the reactivation of a National Technical Committee with members from Cardona's ministry; the Ministry of Education; the Ministry of Environment, Housing and Development; the Colombian Institute of Family Welfare; and the National Teaching Service, among others.

With this new momentum, the strategy began to take a new path. At the time, PAHO was actively promoting a regional initiative on healthy housing. It seemed a good idea to combine efforts in the larger framework of healthy environments. A document outlining this new approach is expected to be signed soon by the participating ministries and other partners.

Positive experiences

About the time these new lines of action make their way to regional and local coordinators (probably in the first half of 2007), the results of an official evaluation of the healthy schools strategy should also be available. Early numbers suggest the results will be mostly positive. By now the strategy is being implemented to one degree or another in all of Colombia's 32 departments. In the nine departments already evaluated, there are some 2,000 schools with an estimated 200,000 students benefiting from the program.

Pending the results of the evaluation, the feedback to date is mostly anecdotal. Caicedo, of La Esperanza school, says: "We've seen parents' participation grow, and we've seen the kids begin to appreciate their environment and get more involved in projects. In fact, sometimes it's hard to get them to leave school. We have to say, 'Okay, it's time to go home now!' because they don't want to leave."

Similar stories can be heard in other schools where the strategy has shown clear results. Nubia Carrasco, a supporter of Ubaté's healthy schools, says that thanks to the regular medical checkups, a number of children have been referred to specialists for serious conditions that were previously undetected. Others have been found to be victims of child abuse. School officials have also seen less dramatic outcomes, such as improvements in appearance and personal hygiene.

As for the chickens at La Esperanza, their outcomes varied. After serving as object lessons in reproductive health, a few ended up as school lunch. Alejandro Ortega, one of the students involved in the project, sold his grown chicken and used the proceeds to buy more baby chicks. The fate of Johana Cortés's bird is a bit more uncertain: "My dad has my chicken. He wants to eat it, but I think it's still alive."

Marcelo Riccardi Doria is a Colombian journalist living in Bogotá.

▲ Students at health-promoting schools can become agents of change, helping to build healthier families and communities.

Unhealthy Competition

by Ruth Levine

Last Word

Global health advocacy has an oddly competitive tone. Those who argue for investments in life-saving interventions often cite estimates of lives saved or diseases averted as if they were part of a high-scoring football match.

More money for immunization, the argument goes, would yield 3 million children's lives a year. More for diarrheal disease control would yield another 2 million. AIDS claims 3 million lives a year, and tuberculosis takes 2 million. New "causes" are rarely welcomed in an already crowded field of injunctions to buy more medicines, train more health workers, spend more money. New priorities find they must use the same metrics of importance and urgency—a count of deaths or some measure of the burden of illness—if they are to get the attention and resources they seek.

Such has been the case since at least the mid-1990s, when the publication of the World Bank's 1993 *World Development Report: Investing in Health* introduced the concept of disability-adjusted life years (DALYs), a measure that combines years of potential life lost due to premature death with years of productive life lost due to disability. Many in the policy community adopted a naïve interpretation of how the concept should be applied to resource allocation: the more DALYs, the more money. Advocates who had earlier focused on specific populations (children or women of childbearing age, for example) or types of health care delivery (such as primary care) quickly learned the new vocabulary of priority-setting and started toting up the DALYs to support arguments for spending on particular types of services, from immunization to bed nets.

The DALY made a major contribution to sound policymaking. By going beyond mortality as the sole metric of health impact, it gave a more balanced perspective to the burden of chronic and nonfatal diseases. It focused decisions about resource allocation on health impact rather than on dubious counts of health system inputs, such as arbitrary ratios of health facilities or medical professionals per inhabitant.

Yet there are logical flaws in the way DALYs are often applied, and these can be profoundly misleading. DALYs estimate the burden of a particular health condition in a population, but they tell us nothing about the difficulty or cost of addressing that health problem. Without complementary information about cost-effectiveness, they provide little guidance on how societies can make the most of every health dollar spent. Ignoring the broader social benefits of addressing particular health problems, they do little to help sort out what governments ought to finance and what is best left to individuals and their families. Naïve use of DALYs—and advocacy-by-numbers in general—can push priorities toward health problems that currently exact major tolls but away from efforts to sustain past achievements or to prepare for future, hard-to-quantify threats, such as pandemic influenza.

When the metric of priority is burden of disease, and the goal is to score the highest DALYs to preserve or enlarge a budget, there are unintended consequences. One serious result can be the fragmentation of both financing and delivery of services. Funding is earmarked for dedicated staff and facilities, or particular drugs or interventions, often yielding poor results for the overall functioning of a system that needs to respond to a diverse population with a whole range of personal and public health needs. Health care management becomes distracted by each new, noisy priority, and opportunities for jointly addressing multiple health problems are lost.

> In the scramble for attention and resources, global health advocates too often find themselves promoting one cause over another… at the expense of the larger needs of health systems.

The most prominent examples of this problem today can be found in the fight against HIV. The scope and threat of HIV are real, and the

urgency of addressing it makes efforts that bypass existing systems and ignore other health care issues somewhat understandable. However, when funding for HIV prevention and treatment is used too narrowly, it can undermine provision of care for other major health problems or for populations not affected directly by HIV. In the past few years, as funding for global HIV programs has risen dramatically (from $300 million in the late 1990s to $8.3 billion in 2005), so have concerns that health personnel are being diverted from routine care by high-profile HIV programs that offer better salaries, and that parallel supply chain management, monitoring, and accounting systems are being created within the health sector, ignoring existing ones. The impact of this kind of pressure on other health problems or populations has rarely been adequately taken into account in the design of disease-specific programs.

Not all disease- or intervention-specific programs have this effect. In the elimination of poliomyelitis from the Americas, for example, an ambitious program that was nominally focused on a particular health problem (polio) and intervention (mass administration of the oral vaccine) also strengthened the capacity of the public health systems of the region in a number of areas: management of immunization program logistics, disease surveillance, public health information, and others. Clearly, any additional resources that are generated—whether from international or national sources—in response to a particular health threat have the potential to confer broader benefits for the functioning of health systems, including both government and private components. This being the case, HIV program advocates should welcome new attention to pandemic flu, and those who care about childhood immunization should root for more money for prevention and mitigation of the impact of diabetes.

Increasingly, the global health community is embracing the challenge of using "vertical" disease-specific dollars to support "horizontal" systemic capacity. Some high-profile initiatives that focus on particular health conditions—including the Global Fund to Fight AIDS, Tuberculosis and Malaria and the Global Alliance for Vaccines and Immunization—have invited recipient countries to use resources for "health system strengthening," though there is little clarity so far about how to do this.

Progress depends on many things, but addressing the vertical-horizontal debate is essential. Advocates, policymakers, and program managers should do the following to ensure that any public health resource mobilization—for whatever cause—also serves to strengthen countries' health systems overall:

Address underlying system weaknesses. Identify the gaps in a country's ability to carry out essential public health functions, including disease surveillance, health education, monitoring and evaluation, workforce development, enforcement of public health laws and regulations, public health research, and health policy development. Recognize that key shortcomings in these functions must be addressed to respond to virtually any major health problem that merits public policy attention, whether at the international or the national level.

Invest in systemic improvements. Use new resources to strengthen and build upon existing systems, including information and monitoring systems, supply chains, delivery of services, and others. Design any new program within a long-term framework for strengthening of health system capacity and with short- to medium-term operational plans. The long-term framework can include centrally managed programs—some public health interventions are best organized through such approaches—but these should contribute to the development of essential public health functions, not operate in parallel or for specific, short-term gains.

Measure both operational achievements and health impact. Monitor changes in a country's capacity to carry out essential public health functions, but also measure changes in health conditions. Include routine monitoring of population health status as part of established information systems, as well as through focused, rigorous impact evaluations of particular programs.

Declare a truce in disease-versus-disease advocacy. Mobilize resources using any and all arguments that work. These may include current health impacts as well as potential ones, ethical imperatives and costs to the health system, worker productivity, or other economic outcomes. In some cases, the most effective approach may indeed be disease-specific advocacy, but this should be paired with strong arguments against earmarking funds so narrowly that larger, system-wide objectives cannot also be addressed.

None of these tasks is easy. They require focused and sustained effort at the political, managerial, and technical levels. But given its success during the past decade in obtaining greater visibility and financial support for health in developing countries, the global public health community must now rise to the challenge of spending its resources well—not just for one disease, but for many generations.

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Photo by Steve Uzzell

Children from Venezuela's Lake Maracaibo region are at high risk of Huntington's disease, an inherited neurological disorder that affects an unusually high proportion of the population in this area (see p. 25). Those who have the disease are all believed to be descendants of a woman who settled in the area in the 19th century and passed the gene on through succeeding generations. Research on the region's inhabitants led to the discovery of the gene that causes the disease and is contributing to the development of treatments and the search for a cure.