

# PERSPECTIVES in Health

Volume 8 No. 3 • 2003

The Magazine of the Pan American Health Organization Regional Office of the World Health Organization

# Violence

What Can Public Health Do?

[www.paho.org](http://www.paho.org)

Food in the Americas  
The Biotech  
Divide  
(p. 18)



## The Many Faces of Public Health

Violence is clearly among the most menacing threats to human welfare around the world, yet it has not generally been thought of as a public health matter. Traditionally violence has been viewed primarily as a law enforcement issue, with a focus on punishment and deterrence. There may always be a need for these remedies, but as our cover story shows, violence is largely a preventable problem, and therefore the tools and perspectives of public health have much to offer in dealing with it. Public health methods of measuring the problem, investigating its causes, designing and implementing interventions and evaluating their success provide a promising approach to finding a solution.

Our second article is a photo essay featuring the stunning and poignant photographs of Brazilian photojournalist Sebastião Salgado. A modern-day philanthropist, Salgado has lent his considerable talent and energy to the noble cause of global polio eradication. The Americas eliminated polio and were declared free of the disease in 1994. But through Salgado's powerful images we see how polio still affects boys and girls, men and women in the countries where it has remained endemic. We also see that there is an end in sight to this totally preventable disease. Following health workers as they carry out a multi-country immunization campaign, Salgado documents what should soon become one of the finest successes of global public health.

"Battling over Biotechnology" tackles an issue that has emerged as much more controversial than was foreseen in the exciting early days of this field. Much to the consternation of scientists and companies working in this area, adamant objections have been raised to genetically modified (GM) foods, due to doubts about their potentially adverse effects on health and the environment. While the evidence supporting these objections remains sparse, the concerns cannot be ignored. Public health can play a critical role in addressing them by applying science-based criteria to the evaluation of new GM products. As our article reports, the Pan American Health Organization (PAHO) is actively working with its Member States to incorporate GM food and crops into their existing food safety systems.

This issue also features an article on PAHO's Pan American Foot-and-Mouth Disease Center (PANAFTOSA), showing how veterinary public health is integral to human public health. While foot-and-mouth disease is not directly dangerous to humans, PANAFTOSA's efforts to control it have been essential to ensuring food safety and security in our region while protecting meat production and trade.

This issue closes with two articles on communicable diseases, each with a very different focus. In a review of several recent books, "Purple Death: the Great Flu of 1918" treats us to a brief but absorbing history of the deadly Spanish flu. It reminds us of our vulnerability to such pandemics and is particularly sobering in the aftermath of the severe acute respiratory syndrome (SARS) epidemic earlier this year.

As a final note, our "Last Word" column broaches the enduring issue of stigma and discrimination against people living with HIV/AIDS. It calls attention to the regrettable fact that such discrimination can be found where it is least acceptable: in the health sector, where everyone is by training and vocation purportedly committed to promoting patients' mental and physical well-being. The column is based on a recent PAHO study of this issue and coincides with the launching of a regional campaign designed to eliminate stigma and discrimination from the health sector.

From the cover story to the "Last Word," the articles in this issue of *Perspectives in Health* illustrate the many faces and many strengths of public health. They provide evidence once again that our tried-and-true methods and our unique perspective—which sees all problems as at least partially preventable—can be applied fruitfully to virtually any threat to human health.

*Joan*  
Mirta Roses Periago  
Director

# PERSPECTIVES in Health

## Perspectives in Health

Volume 8, No. 3

Published by the Pan American Health Organization (PAHO)

Mirta Roses Periago, Director

Bryna Brennan, Executive Editor

Donna Eberwine, Editor

Paula Andaló, Contributing Editor

Gilles Collette, Art Director

Bola Oyeleye, Designer

Alex Winder, Production

Armando Waak, Photographer

*Perspectives in Health* (ISSN 1020-5551) is published by the Pan American Health Organization (PAHO), the oldest continuing international public health agency in the world and Regional Office for the Americas of the World Health Organization (WHO).

Its headquarters is located at 525 Twenty-third Street, N.W., Washington, D.C. 20037. Tel: (202) 974-3000

Fax: (202) 974-3663

Internet: <http://www.paho.org/>

© 2003 Pan American Health Organization

All rights reserved

Articles do not necessarily represent the official viewpoint of the Pan American Health Organization. Letters and editorial queries should be addressed to the editor.

Reprints: Articles reprinted with permission must carry the following credit line: "Reprinted from *Perspectives in Health*, the magazine of the Pan American Health Organization, published in English and Spanish." Reprints must carry author's name and two copies must be sent to *Perspectives in Health*.

POSTMASTER: Send address changes to *Perspectives in Health* magazine, Office of Public Information (DPI), Pan American Health Organization, 525 Twenty-third Street, N.W., Washington, D.C. 20037.

### PAHO Member States

Antigua and Barbuda  
Argentina  
Bahamas  
Barbados  
Belize  
Bolivia  
Brazil  
Canada  
Chile  
Colombia  
Costa Rica  
Cuba  
Dominica  
Dominican Republic  
Ecuador  
El Salvador  
Grenada  
Guatemala  
Guyana  
Haiti  
Honduras  
Jamaica  
Mexico  
Nicaragua  
Panama  
Paraguay  
Peru  
Saint Kitts and Nevis  
Saint Lucia  
Saint Vincent and the Grenadines  
Suriname  
Trinidad and Tobago  
United States  
Uruguay  
Venezuela

### Participating States

France  
The Netherlands  
United Kingdom

### Associate Member

Puerto Rico

### Observer States

Portugal  
Spain

## Features

### 2 The Violence Pandemic

by Donna Eberwine

Violence claims the lives of more than a million people every year and leaves many more with physical and mental scars. The authors of the first *World Report on Violence and Health* argue that it is largely a preventable problem and that public health can play a critical role in helping to bring it under control.

### 10 Chronicling the End of Polio

by Paula Andaló

Photojournalist Sebastião Salgado has traveled the world to document human travails in an era of globalization. But his most recent work was inspired by hope: It chronicles the final thrust in the global campaign to eradicate a crippling disease.

### 18 Battling over Biotechnology

by Donal Nugent

Genetically modified crops are becoming the rule rather than the exception in North American agriculture, and they are showing up in a growing number of Latin American countries as well. But lingering doubts about their safety have prompted governments to take new action to address public concerns.

### 24 Crusaders for Animal Health

by Alexandre Spatuzza

Since foot-and-mouth disease was first introduced into the Americas in the 19th century, it has been the single most enduring threat to the region's livestock. Now, with help from the Pan American Foot-and-Mouth Disease Center, the region is on track to eradicate the disease by the end of this decade.

### 28 Purple Death: The Great Flu of 1918

by Sara Francis Fujimura

At least twice during each of the last three centuries, a mutant strain of the influenza virus has emerged, killing hundreds of thousands around the world. By far the most devastating of these was the Spanish flu of 1918. A number of recent books on the subject make sobering reading today, when experts say the world is due for a new pandemic.



# contents

## Columns

First Word  
From the Director

31 Mailbox

32 Last Word  
A Cure for  
Discrimination



### Front cover:

More than 4,000 people worldwide die from violence every day. For some countries, it has become a leading cause of death. Now public health advocates are rallying a far-reaching response to what they say is largely a preventable problem (see story page 2).

Photo illustration by Bola Oyeleye (photo source- Artville Stock Images)



# The Violence Pandemic

How Public Health Can Help Bring It Under Control

by Donna Eberwine

photo © Emerson Diaz/Prensa Libre

**Violence has been with us since the beginning of humanity. But public health advocates argue it is in large part a preventable problem.**

**T**osé Alfredo Padilha, 38, a Brazilian surgeon specializing in emergency medicine, has seen hundreds of victims of firearms violence during his 10 years at Rio de Janeiro's Sousa Aguiar hospital. But one case in particular haunts him. It was a 12-year-old boy from a Rio shantytown who was caught in crossfire between police and members of a local gang. The boy arrived at the emergency room in his mother's arms, bleeding profusely from a gaping shotgun wound in his lower face.

"You could see the panic in his eyes," recalls Padilha. "It reflected his own pain and fear but also the shock of all of us around him. He never really realized the extent of

his trauma because he never saw himself in the mirror."

Padilha's 12-year-old patient was one of the lucky ones. He had a slow recovery that involved several rounds of plastic surgery, but he eventually healed and went back home to his mother. Many of the victims of gun violence who come into Sousa Aguiar are dead on arrival, and many others go straight from the crime scene to the morgue.

"We see some 900 firearm injuries at my hospital every year," says Padilha. "That's nearly three a day, more than in a conflict zone like Gaza. And that's only a small part of the total picture of violence in Rio and Brazil."

With an average of seven firearms deaths daily (according to 2000 data), Rio de Janeiro has among the highest homicide rates in the world. But it is by no means alone in facing a crisis of violence. Violence has become one of the leading causes of death throughout Brazil, as well as in other countries of the Americas and other regions of the world. Globally, nearly 4,400 people per day died as a result of violence in 2000. And rates of violence appear to be increasing in most places where it is high.

Many would argue that violence is an inevitable part of the human condition, but public health advocates challenge that view.

"Violence is a preventable problem," says Etienne Krug, director of the violence and injury prevention program at the World Health Organization (WHO). "It is amenable to the tools we use to address all public health problems, and we need to start using them more than we have already to address the problem."

To rally a growing public health response to violence, Krug and a team of experts from around the world produced the *World Report on Violence and Health* in 2002 as the first global survey of its kind. It reports that an estimated 1.6 million people worldwide died as a result of violence in 2000. That is fewer than the 3 million deaths due to AIDS but greater than the 1.3 million deaths from traffic accidents during the same year.

The panorama of global violence presented in the report is at odds with some commonly held assumptions. Of all violent deaths in 2000, nearly half were suicides, just under a third were homicides and only a fifth were directly related to war. "This is quite different from the picture we get from the media, where the focus is on organized forms of violence," says Krug. "Suicides and homicides represent a much bigger proportion of fatal violence around the world."

The global report also shows that patterns of violence vary across regions and countries. The vast majority of violent deaths occur in low- to middle-income countries, with rates per

*Half of all violent deaths are suicides, a third are homicides, and a fifth are war related.*

100,000 double those of high-income countries. In most regions, suicides outnumber homicides—in Europe, for example, by more than 2 to 1 and in the Western Pacific by as much as 7 to 1. By contrast, in both Africa and the Americas, there are nearly three homicides for every suicide (see graph p. 8). The countries of the former Soviet Union hold the record for the highest rates of both types of violent death. Data show other important differences. Rates of violent death are much higher for men than women in every part of the world. More than three-quarters of all deaths from violence in 2000 were of men, with males aged 15 to 29 being the hardest-hit. In a number of countries, violence is the leading cause of death for men in this group.

The tragic effects of violence go beyond victims and their families. In the United States, "every day we lose four children and 10 young adults to suicide and homicide," says Suzanne Binder, director of the National Center for Injury Prevention and Control at the U.S. Centers for Disease Control and Prevention (CDC). "Besides being tremendous personal losses for people who love them, these deaths represent a huge loss of potential for our country. They're our youth, our workers."

## More than deaths

When it comes to the impact of violence on health, "deaths are only the tip of the iceberg," says Krug. "These are the ones that are portrayed in the media, the ones that are slightly easier to count. But this is only a very small part" of the total burden of violence.

For every death there are many more injuries due to physical and sexual assaults. Yet data on these are harder to come by because fewer countries have good surveillance in this area.

"A large amount of violence does not get reported systematically but needs to be found out through specifically designed surveys," Krug says. "In those surveys, we find some of the most shocking numbers in our report."

Based on studies of nonfatal violence from more than 50 countries, the *World Report on Violence and Health* found that the proportion of women who say they have been victims of domestic violence varies from 10 percent in Paraguay and the Philippines to 22 percent in the United States, 30 percent in Canada, Antigua and Barbados, and 58 percent in Turkey.

"In some countries, up to 20 percent of women say they were sexually abused as a child, and up to 10 percent of men," says Krug. "In some countries, up to 40 percent of women say their first sexual intercourse was forced, and up to 30 percent of men say the same. In a few countries where studies exist on elderly abuse, 5 percent of the elderly say they have been abused in their home by the person who is supposed to take care of them. These numbers are enormous—much bigger than this tip of the iceberg that is mortality."

Beyond the immediate and direct effects of violence are its secondary consequences, which are even harder to measure. Experts on violence against women, for example, say it takes a far greater indirect than direct toll.

"The psychological consequences of violence against women are often more devastating and longer term than the physical ones," says Elsa Gómez, head of the Gender and Health Unit at the Pan American Health Organization (PAHO). "There is evidence that violence is partly responsible for higher rates of depression in women, and it clearly affects reproductive health. Children also suffer the consequences in their mother's womb or during childhood. Much of the effect is on mental health."

▲ A victim of gang violence lies dead in an abandoned house in Rio de Janeiro, Brazil. Statewide, there were some 7,000 deaths from firearms violence in 2000, 94 percent of them men and more than half aged 15 to 29.

Inset: Catarina Pérez Brito, of Guatemala, still mourns her sister María, who killed herself by swallowing an herbicide. Globally, suicide is the most common form of violent death.

photo © Douglas Engler/GlobalAware



# Youth without hope?

PAHO

**M**aría Pérez Brito, a 25-year-old indigenous woman from the town of Nebaj, Guatemala, had threatened to commit suicide several times. She had two children and lived with her parents because her husband had left her. She suffered from epilepsy, which kept her from holding a job as a domestic worker, but she worked hard in the fields. Her father was an authoritarian man who allowed no "discussions" in the house. Seeing no way out, María took a fatal step one day. "She was sweeping and she stopped in front of my mother, gave her some money and said she couldn't take any more," her sister Catarina recalls.

"María said 'everything will be okay now,' and she took some gramoxone [an herbicide]. My father refused to take her to the hospital because it was something that had to be dealt with at home. They tried to cure her with home remedies, but two weeks later she died," says Catarina. The family had to watch her as she went through a slow, painful death and said goodbye to her children and siblings. Afterward they had to live with the fact that they had done nothing to help.

"My sister wanted to get an education, but she could never do it and had to settle for working for my father," recalls Catarina. "When she died, we all felt terrible. But nothing changed, and that's why I finally decided to leave." At 17, Catarina mustered the strength to attend school away from home. "The situation was intolerable, with problems and arguments every day," she says.

Catarina says she was more fortunate because she got help from her friends. "They have supported me in school, and there are a lot of things I still want to do." It's been two months since she last visited her home. "I don't think María made the right decision," she adds, pointing to a photograph of her sister on the wall. "But sometimes things get the better of you, and I've even thought of suicide myself."

There are no official statistics on suicide in Guatemala. The subject is generally taboo, and families tend to hide

*Repressive parenting and lack of opportunities contribute to suicide among young Guatemalans.*

the fact when it happens. Officials commonly report deaths according to their final cause, such as poisoning, hanging or shooting. But according to a survey by the Guatemalan Mental Health League, 43 percent of respondents knew a young person who had committed suicide, most of them between 15 and 25 years old.

Experts point to a long list of factors that contribute to suicide among young people, but perhaps the most important is that they are ill prepared to deal with their problems. Other factors include repressive parenting, poor employment opportunities, lack of services for high-risk youths and broken families, according to the Mental Health League.

"Young people live for tomorrow, not so much for the present," says a report by the League. In Guatemala, opportunities for young people have been shrinking in recent years as the country has suffered an economic and social crisis.

In Nebaj, Quiché, 48 young people have killed themselves in the past six years. To try to stop the trend, a group of young people got together and formed the Nahual Association. With no outside help, the group has interviewed families of suicide victims and young people who have attempted suicide. They have gathered information from hospitals and the



▲ Catarina Pérez Brito, an indigenous Guatemalan teenager, says her sister committed suicide because she saw no way out of her father's authoritarian grip. "She wanted to get an education, but she could never do it."

ministry of justice and have consulted with experts on related subjects.

Based on that work, they conclude that young people commit suicide primarily out of hopelessness, the inability to confront their problems, and social and family repressiveness.

Eduardo Cruz, one of the group's leaders, says suicide has not been taken seriously enough. "We began our work because our young people were dying, leaving those behind destroyed. Young people are not taught how to face problems. Those with more initiative join gangs to avoid their problems while the weakest ones opt for suicide."

"Young people are going through a confusing time, just like the country," he adds. "The solution would be to begin helping families, increase communication, provide services for troubled youths and ensure sustainable development that can provide them opportunities."

—Lorena Seijo, Prensa Libre, Guatemala

The economic costs of violence are among the most difficult impacts to measure. "What does violence cost in terms of lost productivity and economic development? What is the price of lost quality of life, for example, if we cannot walk around in the evening safely? All of these costs have never really been calculated for most countries," says Krug.

More research in these areas is needed to fill in the gaps and point the way toward public health actions that can reduce and prevent violence, public health advocates say. "It's only when we start putting up dollar signs that we can really get decision-makers more actively involved," says Krug. "We need not only to describe the vast amount of human suffering due to violence but also to point to the enormous financial losses that could be avoided through adequate prevention."

**P**ublic health research on violence has already begun to address the issues of what causes violence and what kinds of action might be taken to prevent it. Among the questions studies have examined are: What makes individuals behave violently? What are the environmental influences on this behavior? What are the community and societal influences? What are the key risk factors?

"The causes and risk factors of violence are very complex," says Alberto Concha-Eastman, PAHO regional advisor on violence and injury prevention. "There are influences on many levels: biological, psychological, behavioral and social factors."

Looking at biological influences, a 1991 study in Denmark found that 80 percent of youths arrested for violent offenses scored in the high range for delivery complications during birth. A 1993 U.S. study found that delivery complications predicted future violence when a parent had a history of mental illness. Other studies have found that low heart rates, particularly in boys, are associated with sensation-seeking and risk-taking behavior, while high heart rates are linked more to anxiety,

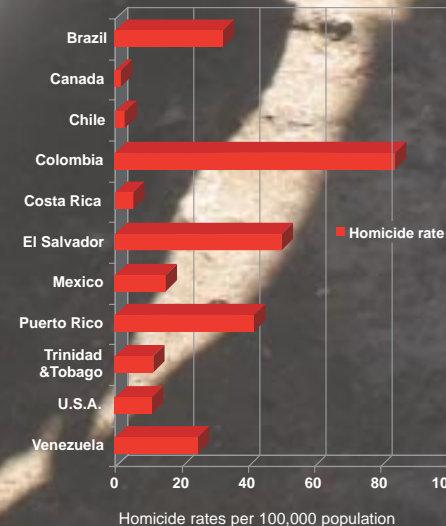
fear and inhibitions. Other studies suggest that nervousness and anxiety are negatively related to violence.

More research has been produced on family and social influences. "We know that being a young male, under specific social and family conditions, is a risk factor for committing acts of violence," says Concha-Eastman. "Having witnessed or experienced abuse as a child is a risk factor for perpetrating violence later in life. Abuse of alcohol is another risk factor. We know that children who grow up in families with poor parenting practices, no supervision, where there is marital conflict, they are at greater risk of committing violence and of being victims of violence themselves. Individuals who grow up with lots of peers involved in violence and crime, this too is a risk for committing violence. Lack of schooling and poor work opportunities are major social factors that lead to involvement in violence."

Research also shows that living in a community with high levels of poverty, unemployment and drug trade activity is a risk factor, as is living in a society with high levels of gender or income inequality or social norms that tolerate or support violence.

Rodrigo Guerrero, former mayor of Cali, Colombia, and a public health expert by profession, relates current high levels of violence in his country with the legacy of political violence during the 1940s and 1950s. "The problem in

Deaths by homicide among youths aged 10 – 29 by country, 1990 – 2000



▲ A police officer patrols the streets of Rio de Janeiro, Brazil. The country recently passed new gun control legislation in an effort to control spiraling violence.



## Making peace in Cali

In 1992, while campaigning to become mayor of Cali, Colombia, Rodrigo Guerrero found that the biggest concern of the city's citizens—from the richest to the poorest—was violence. Everyone seemed to know someone who had been the victim of some kind of violence.

Once he was elected and took office, Guerrero resolved to do something about it. An epidemiologist by profession, he decided to use his training to develop a violence prevention program, which he named DESEPAZ (Spanish initials for "development, security and peace"). To provide a solid basis for an effective response, he brought in experts from a variety of disciplines, who together mapped out patterns of violence in Cali. They found that 30 percent of homicide victims were intoxicated, that homicides tended to increase on weekends and were concentrated in areas of

nightlife, and that 90 percent of homicides were committed with firearms. The victims were overwhelmingly young, male and low-income.

Guerrero used the information to strengthen educational programs, holding seminars on civic culture and launching public awareness campaigns promoting tolerance and self-control. He also decreed a "semi-dry law" that forced discotheques and liquor stores to close earlier. The campaign borrowed the words of Mexican national hero Benito Juárez for a slogan: "Peace is respecting the rights of others."

Guerrero's program lasted two years and seven months, to the end of his term as mayor. During this time the city's homicide rate fell from 126 per 100,000 to 80 per 100,000.

Guerrero believes that violence has become deeply entrenched in Colombian society and that it shows few signs of abating. "In

2002, there were 26,000 homicides in Colombia, of which 5,000 were by the guerrillas and 21,000 by the general population," he notes.

Guerrero has been aware of the long arm of violence since he was a child. "I didn't experience it directly, but I always heard talk about political violence and the historic conflict between the liberals and conservatives in the Cauca Valley." He believes that period and Colombia's subsequent guerrilla war have had the effect of legitimizing the notion that political ideals can be pursued through the use of violence.

"Violence has existed as long as mankind," Guerrero says. "But a lot can be done to mitigate it. If man is his own worst enemy, you have to do intensive education. Conflicts are inevitable, but we can learn to resolve them in a civilized way."

—Paula Andaló

## More danger in numbers

The Americas have proven to be fertile ground for the growth of gangs and gang violence in recent years. According to a 1996 study, some 31,000 gangs operate in 4,800 cities and towns of the United States. Data on El Salvador and Honduras indicate that each country has as many as 30,000 to 35,000 active gang members, a dramatic increase from earlier years. In Brazil, gangs are a major contributor to the high homicide rates in large cities.

To examine the underlying causes of growing gang violence, researchers from the Central American University in El Salvador trained ex-gang members to conduct interviews with current members focusing on factors associated with violent behavior or with becoming victims of violence. Based on interviews with 938 gang members (83 percent of them males), the study found that:

- All gang members had engaged in violence, and one in four admitted to killing someone.

- Use of drugs and alcohol was positively related to violent behavior.
- Females tended to engage in less violence but were more likely to be victims of violence themselves, especially if they were drug users.
- Those with a history of violence at home engaged in more violence and were more likely to be victims themselves.
- More than half the respondents said they would like to stop participating in violence and taking drugs.

The study, published by the Pan American Health Organization as *Inside the Neighborhood: Salvadoran Street Gangs' Violent Solidarity*, also found that external factors contributed to gang membership, including poverty and unemployment, poor access to social and public services, and exposure to community and social violence. Internal factors included poor parenting practices and favorable attitudes toward corporal punishment.



photo © Daniel LeClair



photo © Jim West/GlobetAWARE

▲ A 7-year-old grieves for schoolmate Kayla Rolland, a first grader killed in February by a classmate who brought a gun to school in Flint, Michigan, USA. The gun belonged to a 20-year-old uncle, who was convicted of involuntary manslaughter in the case.



photo © Douglas Engle/GlobetAWARE

Colombia is that a large part of society learned to resolve conflicts through violent methods—from crimes of passion to someone who kills his neighbor because he is too noisy," Guerrero says.

Research shows that the availability of means to commit violence, such as accessible handguns or pesticides for committing suicide, is another risk

▲ Graffiti in Rio de Janeiro's Roquete Pinto favela, or slum, incites rival drug gangs. Shootouts involving both gangs and the police are common in Rio, and the death toll rivals that of declared war zones.

factor, along with weak police forces and criminal justice systems.

### Proven responses

The growing concern about violence has produced not only research but also efforts around the world to address its causes and risks. "There is not a single country where there are no

▲ Top right: A gang member in San Pedro Sula, Honduras, sports an elaborate tattoo. A Honduran law allows police to detain anyone with a tattoo, which often—though not always—signifies gang membership.



photo © Daniel LeClair

violence prevention efforts," says Krug. "The vast majority of programs unfortunately have not been evaluated. From those that have been, we know that it is possible to act on individuals, families, communities and societies to address the causes and really prevent violence."

Proven public health responses to violence include efforts to promote

▲ A woman shows the machete she now sleeps with after gang members broke into her small shack, then robbed and beat her in front of her children.



anger management, such as pre-school enrichment programs that teach young children that violence is not the only response to stress, Krug says. Programs that work with children who are victims of family violence can help prevent them from becoming adults who perpetrate violence themselves. Programs to improve parenting skills in high-risk families have also shown success in some settings.

The “healthy communities” approach, which promotes improvements such as better outdoor lighting, more parks and recreation centers, and organized activities for youth, has also been effective in some settings. Efforts at the societal level include strengthening police and judicial systems, reducing poverty and inequality (both gender and income), improving education and controlling access to guns and other tools of violence.

In suicide prevention, efforts to restrict access to lethal means have shown some striking results. In Samoa, suicide rates declined dramatically in the 1980s when the poi-

sonous pesticide paraquat began to be tightly controlled. In England, the removal of carbon monoxide from domestic gas and car exhaust in the 1960s helped lower that country’s suicide rates.

“Many programs have shown success, and it’s a question now of learning lessons from them and implementing and evaluating them in different settings,” says Krug. “Public health can do more, contributing in all these areas where we can be helpful. We have first access to victims in emergency departments and morgues, for example, where we can collect information on the problem. We can contribute to research and to prevention, just as we do for many other public health problems. We can do more to encourage policy-making and informed decision-making in this area.”

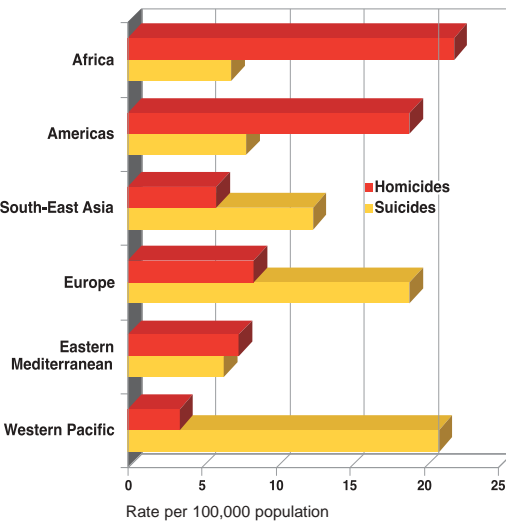
But tackling violence cannot be left to the public health community alone. Because its causes are so complex and varied, effective action to reduce violence must come from many sectors and many levels. The WHO report makes nine recommendations for effective action to reduce violence:

- Develop, implement and monitor national action plans for violence prevention.
- Improve data collection on violence.
- Support research on the causes, impact and prevention of violence.
- Promote primary prevention responses.
- Strengthen responses for victims of violence.
- Integrate prevention into social and educational policies; promote gender and social equality.
- Increase collaboration and information exchange on violence prevention.
- Promote and monitor compliance with international human rights laws and treaties.
- Seek international responses to the global arms and drug trades.



photo © Daniel LeClair

Homicide and suicide rates by WHO region, 2000



## Informing the debate

**B**razil is one of a number of countries with soaring rates of violence in recent years, particularly armed violence in its major cities. Public health advocates have been working to produce data on the scope and dimensions of the problem to inform the policymaking debate surrounding it.

A groundbreaking effort in this area is a comprehensive study of firearms violence by the Center for the Study of Violence at the University of São Paulo, part of a World Health Organization (WHO) initiative that promotes violence prevention programs in developing countries.

A chief aim of the study is to identify the types of areas and population groups that are most affected by armed violence. “The settings where violence is a daily obstacle to healthy lives and survival are exactly the settings where we know the least,” says David Meddings, WHO’s Geneva-based focal point for the project. “This is an important first step

in profiling the problem of armed violence and making a constructive contribution to national, regional and local policy.

One of the study’s key findings so far is that a number of state capitals in Brazil have gone, over a 10-year period, from relatively low to very high rates of firearms-related deaths, according to Meddings. “But there are other state capitals that have had impressive declines in armed violence,” he adds. “We want to carry out an inventory of violence prevention programs to find out if they correlate with these more or less violent cities.”

Maria Fernanda Peres, Brazilian coordinator for the study, says one area of policymaking that has drawn on public health research is the debate over gun control. Brazil recently passed a so-called “disarmament law” that places tighter controls on owning and carrying guns. Supporters of the law cited data showing that homicides due

to interpersonal conflicts increased during the same period as homicides resulting from urban street crime. “In violence involving neighbors or family members, or altercations between strangers on the street, the availability of firearms is an important variable that significantly increases the chances of injury or death,” notes Peres.

However, she says, “It is important to note that this law cannot be the only measure to resolve the problem. It’s only one step, and many other things need to be done. One of the most important things, in my opinion, is to try to reduce the extreme feeling of insecurity of the population and also to reduce the huge social inequities that exist in Brazil.”

Meddings agrees: “The focus on firearm access is important, but if the bigger prize is a true reduction in armed violence, there are a host of social, economic and human environmental factors you have to consider as well.”

## Coalition against violence

**A** unique example of bringing diverse sectors and stakeholders together to tackle the complex problem of violence is the Inter-American Coalition for the Prevention of Violence, formed in 2000 by the Pan American Health Organization (PAHO), the U.S. Centers for Disease Control and Prevention, the Inter-American Development Bank, the Organization of American States, the United Nations Educational, Scientific, and Cultural Organization, and the World Bank. In 2002, the U.S. Agency for International Development (USAID) became the seventh member and first bilateral donor.

The coalition promotes a multisectoral approach to violence prevention in the Americas. It encourages the development of partnerships and programs involving government officials, business leaders, religious leaders, the media and the general public to raise awareness about the social and economic costs of violence and to increase knowledge,

skills and networks for violence prevention activities.

The coalition recently launched a project in cooperation with the Federation of Central American Municipalities to address escalating violence in that region. Funded by USAID, the project aims to raise awareness of the impact of violence and its underlying causes, promote better surveillance of the problem, develop municipal prevention plans for prevention, and encourage the development and cooperation of leaders from different sectors to reduce violence.

“All our members share the view that we need to shift emphasis from control of violence more toward prevention,” says Alberto Concha-Eastman, PAHO advisor on violence. “Law enforcement alone has not been able to reduce it. What is needed are different talents, expertise and disciplinary approaches working on all these complex and varied aspects of violence.”

“Perhaps the most important of these is number four, promoting primary prevention responses,” says Krug. “Too often the response to violence is putting more police in the streets. That probably helps for some types of violence, but it does very little to prevent child abuse, elderly abuse, violence against women in the family, or suicidal behavior. We need to complement that by acting on the root causes of violence. This is public health’s first duty.”

*Donna Eberwine is editor of Perspectives in Health.*

▲ Police hold suspected gang members after a roundup in Comayaguela, Honduras, part of efforts to control increasing violence. Some 30,000 Hondurans, most of them young men, are members of gangs.



# Chronicling the End of Polio

by Paula Andaló



With

an artist's eye and an economist's acumen, photographer Sebastião Salgado has put a human face on the problems of globalization. In his latest work, he documents the international effort that has finally brought the end of a crippling disease within sight.

▶ During India's 2001 national immunization campaign, officials in Moradabad, Uttar Pradesh, prevented trains from leaving the station until all children on board had been vaccinated. In 2002, Uttar Pradesh had more than 1,000 new cases of polio—66 percent of all new cases in the world that year.

photos © Sebastião Salgado/Amazonsas - Contrast Press Images



**S**ebastião Salgado has very nearly seen it all. The Brazilian photographer has traveled to more than 100 countries to document the human consequences of war and famine, the plight of manual laborers and the struggle of dispossessed farmers.

But even Salgado saw it as a once-in-a-lifetime opportunity when the United Nations Children's Fund (UNICEF) approached him and proposed that he chronicle the lingering effects of polio in the 21st century and the global effort to eradicate the disease. When the effort succeeds, polio will be only the second human disease in history, after smallpox, to be eradicated entirely from the earth.

"I had no idea before they asked me to work on this book that polio still carried a stigma for so many people," says Salgado. "I generally try to provoke a debate with my photos, but it was different with this campaign. There was added value: I was given the historic task of recording a battle won, of offering hope. This book is a tribute to the efforts of health workers, to those who suffer from polio, and to the dignity of man."

Accepting the UNICEF assignment, Salgado began a journey in 2001 that would take him to five countries on two continents. Side-by-side with health workers he traveled by boat on narrow rivers and by motorcycle down dusty roads to deliver vaccines to all-but-forgotten settlements where polio has remained endemic even as most of the world has eradicated the disease. He photographed polio victims, many of them now adults but many children too, documenting their efforts to live normal lives despite the disease's crippling effects. A selection of these poignant photos was exhibited at the Pan American Health Organization (PAHO) and other venues before their publication earlier this year in book form as *The End of Polio: A Global Effort to End a Disease* (Bulfinch Press).

*"I generally try to provoke a debate with my photos, but it was different with this campaign. I was given the historic task of recording a battle won, of offering hope."*

**I**n its 3,500-year known history, polio has robbed millions of boys and girls, men and women of their freedom to move at will. Vaccines developed in the 1950s began to rein in the virus, dramatically reducing the disease's incidence through massive immunization campaigns.

The Americas region was the first to eradicate the wild strain of the virus and was declared polio-free in 1994. Luis Fermín, a 3-year-old Peruvian, was the hemisphere's last registered case. Western Europe was declared polio-free in 2002. But other regions have been less fortunate. Polio remains endemic in seven countries: Afghanistan, Egypt, India, Niger, Nigeria, Pakistan and Somalia. Twenty million people today are paralyzed as a result of the disease.

The Global Polio Eradication Initiative, launched in 1988 by the World Health Organization, the

U.S. Centers for Disease Control, Rotary International and UNICEF, has brought the disease's end within sight. In just over a decade, the cam-

paign helped reduce cases of polio paralysis from 350,000 to 500 in 2001, preventing an estimated 4 million cases of permanent disability

▲ In the Democratic Republic of Congo, motorcycle teams carry containers full of polio vaccine from Kisangani to remote villages in the equatorial forest. It is a risky journey: Two weeks earlier a doctor conducting immunization surveys was shot on the same road.





PAHO

*“It’s hard to look at someone and think that he deserved a better life but because of geographical circumstances he has had to suffer more than someone else.”*

due to the disease. Following in the footsteps of health workers through Congo, India, Pakistan, Somalia and Sudan, Salgado captured part of the historic last stretch of the effort to eradicate polio.

In the two years since Salgado completed his journey, the eradication drive has encountered new obstacles. The number of cases in India quadrupled in 2002 as a result of an epidemic in the country’s north, but redoubled vaccination efforts have once again brought the number of cases down. This year, the disease spread from Nigeria to Ghana and Burkina Faso, prompting emergency vaccination campaigns in those countries as well as Togo, Benin, Cameroon and Chad. As of late October, however, the total number of cases worldwide for 2003 was down to 520.

It was three decades ago, one day in 1970, that Salgado’s wife Leila put a camera in his hands. That simple act changed his life. A

week later he bought one for himself, and within a month he had built a darkroom in his Paris home. Salgado left behind a career as an economist and embarked on a “road of no return,” as he puts it, that transformed him into one of the most respected photographers in the world.

“When I looked through that lens, I discovered another world,” says Salgado. “Photography took over my life. It took a while before it became my work and my reason for living—I think it was 1973 that I began my life as a photojournalist.”

Salgado was born in 1944 in the Brazilian state of Minas Gerais. He studied economics at the University of São Paulo and, after leaving Brazil for political reasons, received his Ph.D. in 1971 from the University of Paris. It was in the French capital that he fell in love with that first camera. After a number of assignments as an economist—including a stint in Africa with the International Coffee Organization—he returned to Paris and decided to leave the world of economics behind once and for all.

Even in his new life, however, Salgado never lost his economist’s perspective. It sharpened his eye as he observed the struggles of workers, refugees and migrants in an era of globalization. Traveling also helped shape his outlook.

“I travel 10 months out of the year. The only thing I haven’t seen are the poles,” says Salgado. “And I can attest to the fact that the essence of being human, wherever you go, is always the same. Human beings want dignity. No one is immune to pain. It’s very hard to look at someone and think that he

The Amar Jyoti Rehabilitation and Research Center in New Delhi serves 540 disabled children. In 2002, more than 80 percent of all new cases of polio worldwide occurred in India.

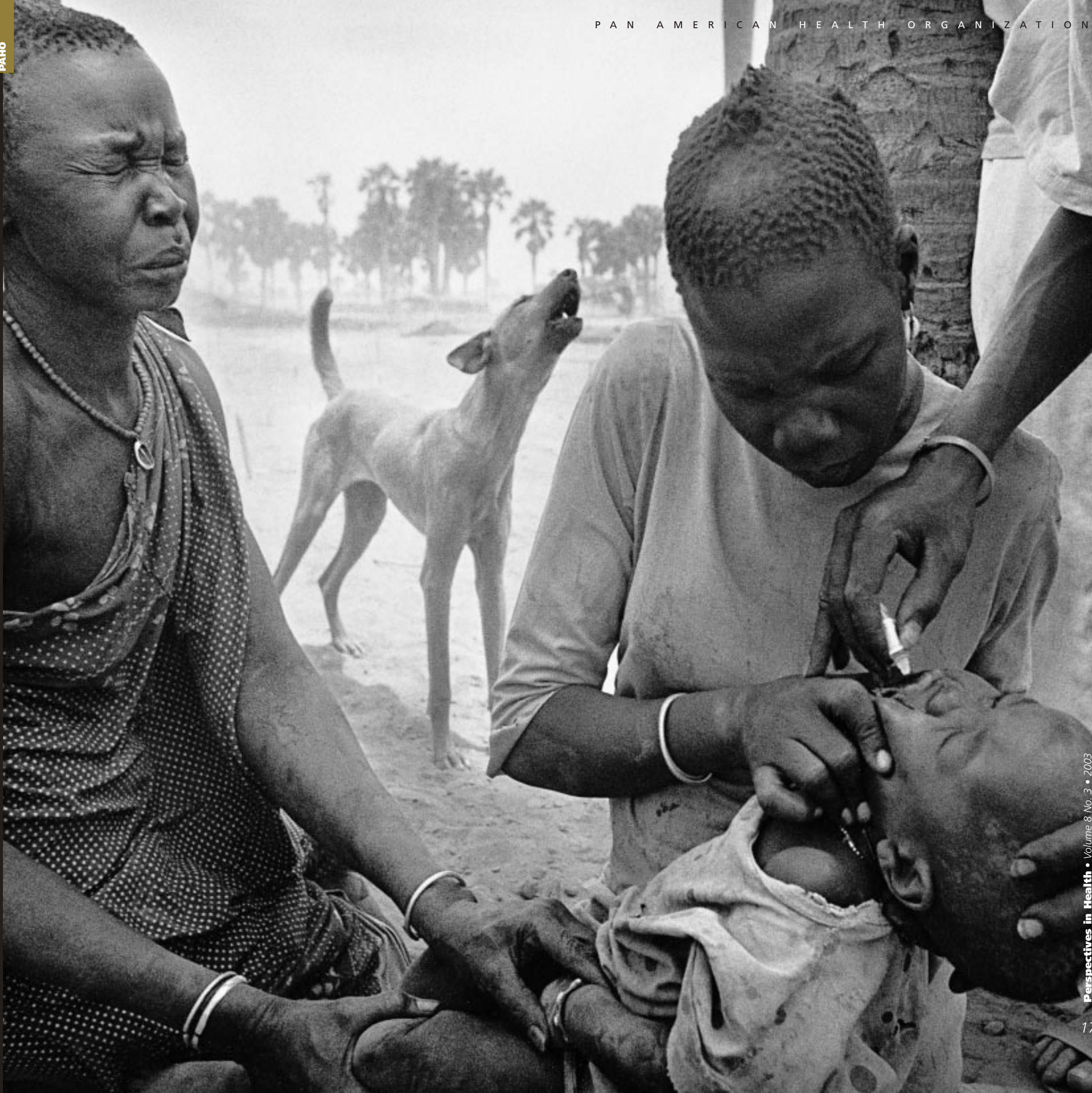
Top: In Baidoa, Somalia, singers and musicians are responsible for spreading the word about the national immunization campaign. Their role is critical in encouraging health workers and persuading parents to have their children vaccinated.







PAHO  
Photo © Armando Wask/PAHO



*“I travel 10 months out of the year. The only thing I haven’t seen are the poles. And I can attest to the fact that the essence of being human, wherever you go, is always the same. Human beings want dignity. No one is immune to pain.”*

or she deserved a better life but because of geographical circumstances has had to suffer more than someone else.”

Salgado is today involved in efforts to reforest his native state of Minas Gerais, where he bought a family ranch in 1990. He splits what little free time he has between the ranch—surrounded by monkeys, parrots and crocodiles—and his home in Paris.

Meanwhile, if the goal of a polio-free world by 2005 is to be met, those 520 cases must be brought down to zero. With his photographs, Salgado presents an admiring portrait of this final battle in one of the great wars for human dignity.

*Paula Andaló is a journalist working in the Area of Public Information of the Pan American Health Organization in Washington, D.C.*

▶ A mother cringes and a family pet howls as health workers administer the painless oral vaccine to a Sudanese child during the 2001 immunization campaign. With only one case of polio in 2001 and none in 2002, Sudan—Africa’s largest country—has now been declared polio-free.





photo courtesy of the International Maize and Wheat Improvement Center (CIMMYT)

# Battling over Biotechnology

by Donal Nugent

**Genetically modified foods could herald a new era of food security and greater prosperity throughout the Americas. But public doubts about their safety will have to be addressed.**

**B**y the 1500s, the Incas of Peru had constructed a highly sophisticated, state-supported agricultural system. On stepped mountain terraces bound by stone walls and irrigated by canals, they farmed crops then unknown to Europeans: tomatoes, potatoes, oca, peppers and, in the lowlands, corn and cotton. From wild landraces they created new genetic strains that produced harvests bountiful enough to feed an empire. It was biotechnology as advanced as a Stone Age people could perfect it.

Today, modern Peru takes a more cautious approach to an equally groundbreaking advance in agriculture. Its government has banned the growing of genetically modified (GM) crops because it believes not enough is known about their impact on the environment.

Fifty years ago, the publication of James Watson and Francis Crick's paper identifying the double-helical structure of DNA



photo courtesy of Monsanto Company

heralded a new era in science. In 1964, the so-called Green Revolution was kick-started with the introduction into Third World countries of new high-yielding varieties of wheat and rice. By 1978, scientists had demonstrated the practical value of biotechnology by producing human insulin through genetically modified bacteria (before this, diabetics depended on the insulin recovered from slaughtered pigs).

In 1994, another milestone followed. The American seed company Monsanto unveiled a new variety of soybean genetically engineered to be resistant to the herbicide glyphosate. Glyphosate is a highly effective herbicide that is particularly attractive from an environmental point of view because it is less toxic than many other herbicides and breaks down more quickly into relatively harmless components. The new soybean would require fewer pesticide applications, facilitate better environmental management and result in greater productivity on farms.

▲ Genetically modified soybeans account for nearly half of total soy production worldwide. Brazil recently eased its ban on GM soy in view of widespread planting of the product by farmers in the country's south.

A decade later, biotech crops represent the fastest take-up of new technology in agricultural history. Today 46 percent of the world's soybean crop is GM, as is a quarter of all corn production in the United States.

But not everyone has jumped on the bandwagon. The European Union initially accepted imports of GM corn and soy from the United States until a major consumer backlash prompted a five-year moratorium on any new varieties starting in 1998. This was followed with a decision this year to license GM crops on a case-by-case basis. But many European consumers remain skeptical. As recently as July 18 of this year, the British newspaper *The Guardian* reported threats of civil unrest if GM crops were planted in Britain.

The U.S.–Europe standoff on GM foods is significant in its own right, but it also affects other countries around the world. Zambia, for example, made international headlines last year when its government rejected GM corn as

food aid from the United States out of fears that it might “poison” its citizens and jeopardize its trade relationship with Europe.

Within the Americas, individual countries are aligning themselves on different sides of this GM fence. Latin America's top two food producers provide contrasting examples. Argentina has emerged as the world's second-largest grower of GM crops, primarily soy but also corn varieties licensed in the European Union. Meanwhile Brazil, the world's second-largest producer of soybeans, until recently refused to license any commercial GM crop varieties. Yet in fact GM soy has been planted widely in certain areas of Brazil because farmers find it more productive and easier to grow than conventional varieties.

## Issues at stake

Far more is at issue in this controversial debate than the fears of well-fed consumers in the developed world. According to the United Nations Food and Agriculture Organization (FAO), more than 50 million people worldwide suffer from chronic malnutrition, and proponents argue that GM crops can and should play a critical role in addressing their needs and those of future populations.

Since 2000, the AgBioWorld Foundation has collected signatures from more than 3,200 scientists in support of GM agriculture in the developing world. Among them was Nobel Peace Prize winner Norman Borlaug, the father of the Green Revolution.

“The majority of agricultural scientists, including myself, anticipate great benefits from biotechnology in the coming decades to help meet our future needs for food and fiber,” Borlaug wrote in the October 2000 issue of *Plant Physiology*.

Critics counter that, hunger notwithstanding, GM foods pose more risks than benefits. Greenpeace charges that GM crops are put in foods despite unknown health risks, that they can produce allergies and antibiotic resistance and that they “genetically contaminate” wild populations and ecosystems.

▲ Conventional corn varieties in Mexico can acquire transgenic traits through cross-pollination with genetically modified corn, which is officially banned. How significant this is the subject of heated debate.





Photo courtesy of the International Maize and Wheat Improvement Center (CIMMYT)

Most members of the scientific community view such claims as unfounded or wildly exaggerated. The American Society of Toxicology said in a 2002 position paper: "The available scientific evidence indicates that the potential adverse health effects arising from biotechnology-derived foods are not different in nature from those created by conventional breeding practices.... It is therefore important to recognize that it is the food product itself, rather than the process through which it is made, that should be the focus of attention in assessing safety."

## Both sides now

If biotechnology were the new Cold War, then Chile would be its unlikely Berlin Wall. Isolated between the Pacific Ocean and the Andes mountains, and with a small growing area (only an estimated 3 percent of the country is arable land), Chile has been able to exploit its unique geography

to secure niche markets internationally in what seem to be mutually exclusive enterprises, organic foods and GM seeds.

The country has a population of 16 million, of whom approximately 20 percent live below the poverty line. Since 1992, Chilean law has allowed GM seeds to be imported into the country, "multiplied," and then exported, but not planted for food production.

Carlos Muñoz Schick, an agronomist at the National Institute for Agricultural Research, says that Chile's agricultural policy is to increase the country's international market share by developing niche enterprises rather than competing with countries like Argentina and Brazil in commodity products. Toward that end, Chile has introduced nontraditional crops such as kiwifruit, blueberries and organic produce into its food-export basket and, more recently, has begun domesticating wild native fruits such as the *murtilla*, a richly flavored berry.

Within this strategy, biotechnology could play a significant role.

"Biotech may help in developing new market niches, improving the quality of our produce, and even creating new technologies—new cultivars, for instance, better adapted to the Latin American environment," says Muñoz. "Creating new jobs is a must for our economy," he adds.

A similar analysis underlies recent research into the possibility of growing GM salmon in the country. One of the world's biggest suppliers of salmon, Chile is looking at the possibility of breeding a biotech variety that grows four times faster than conventional salmon. The reaction of consumers in export markets will be a deciding factor in its eventual commercialization.

The relationship between GM and organic growers in Chile is not without controversy. The location of GM seed farms has been kept secret by the government since production began in the early 1990s. In January 2002,

## Regulating the risk

As part of its efforts to promote food safety in Latin America and the Caribbean, the Pan American Health Organization (PAHO) is helping countries in the region update their food safety systems to incorporate GM foods. In February, PAHO, the World Health Organization (WHO) and the U.N. Food and Agriculture Organization (FAO) organized a meeting at the Pan American Institute for Food Protection and Zoonoses in Buenos Aires, Argentina, to discuss the safety of GM foods and the region's ability to regulate them.

Jørgen Schlundt, director of WHO's Department of Food Safety, said at the meeting that WHO and FAO have created a special task force to develop international standards for risk assessment, management and communication on biotech foods. So far, according to the group, GM crops and foods currently on the international market have passed risk assessments that have deemed them safe to human health. But WHO/FAO experts emphasized the need for continuing assessments on a case-by-case basis for future GM food and crops.

The meeting concluded that, if adequately implemented, biotechnology can play an important role in boosting food production and enhancing food security in the region. But "like other technologies, in order to improve the way food is

produced and processed, biotechnology should be properly evaluated in terms of the potential direct and indirect risks and benefits that it poses to public health," says Genaro Garcia, a PAHO advisor on food safety who helped organize the meeting.

Among its specific recommendations, the meeting called for:

- Development of an international framework for risk assessment of genetically modified organisms (GMOs) used in food production;
- Evaluation of all new GM crops and food for health risks such as allergenicity, toxicity and development of resistance;
- Improvements in infrastructure and human resources for applied research and technology in the developing countries.

Participants also acknowledged that public fears and confusion about GM foods are real and must be addressed. Garcia says a first step in this direction would be to assess consumer response to biotechnology, particularly biotech food in Latin America.

"Some surveys of consumers have been conducted in the U.S.," says Garcia. "But in Latin America there is no science-based information that explains what the position of the consumer is. Consumers must be informed and educated properly, so that informed decisions can be made."

following litigation by organic producers, a Chilean court ordered the Cattle and Agricultural Service to disclose the location and ownership of fields planted with transgenic crops. That decision is under appeal. The concerns of organic farmers were further heightened later in the year when France returned two batches of maize seed to Chile because they contained transgenic material above the allowed 0.5 percent threshold.

## Regional variations

Over the last 13 years, Argentina and Brazil have emerged as major suppliers to the world commodities market. According to U.S. Department of Agriculture (USDA) figures, soybean production has more than doubled in both countries. Argentina's production of wheat and corn has increased by 75 per-

cent and 105 percent, respectively, and Brazil's corn production by 40 percent.

In the late 1990s, Argentina moved from a de facto moratorium on GM crops to becoming the leading commercial GM grower outside the United States. The use of GM cotton was first authorized for the 1996–97 growing season, a move soon followed by the licensing of GM soy. Today 90 percent of Argentina's soybeans are GM, and the country grows corn genetically modified to resist insects and tolerate herbicides.

In Brazil, meanwhile, government policy has been largely opposed to GM crops, even though the country has its own home-grown biotechnology research sector that is globally renowned. As an officially "GM-free" commodities producer, Brazil has emerged as the supplier of choice for many E.U. importers. Yet the reality on the ground has been somewhat different. A 2001 USDA report estimated that 20 percent to 40 percent of soy planted in Brazil's south is GM. Other estimates put the figure at up to 80 percent.

Under mounting pressure, the Brazilian government in September issued an executive decree that allows farmers to plant GM soybeans—but only if they already possess the GM seeds and only during the 2003–2004 growing season. Farmers must also agree to assume financial responsibility for any environmental damage that might result.

Meanwhile, the Brazilian government has allowed researchers to conduct field trials on a wide array of transgenic crops, focusing on insect and virus resistance as well as herbicide tolerance. Government-funded research institutions, an indigenous private biotech sector, and multinational life sciences companies are involved in trials of tobacco, potatoes, sweet corn, papaya and sugarcane, as well as cotton, corn and soybeans.

▲ Some 80 percent of Mexican cornfields are on small-scale farms, where experts say current varieties of GM corn would not be likely to thrive. Government restrictions have discouraged research on new, better-suited GM varieties.





Photo courtesy of Monsanto Company

## Future foods

In global terms, the ratio of commercialized biotech products to those that have been developed in laboratories is something akin to an iceberg above and below water. The U.S.-based International Food Information Council has identified what it terms a “second generation” of biotech-enhanced products that could soon find their way to the supermarket shelf. Among them are cooking oils with higher stearate concentrations (and so not requiring hydrogenation), single-serve seedless melons, tomatoes with increased lycopene (a powerful antioxidant), higher-starch potatoes that absorb less fat, and strawberries higher in ellagic acid (a natural cancer-fighting agent). Add to these a host of nonfood products under development as well.

Chile is among the Latin American countries determined not to be left behind in this process. In June 2003, its National Commission for the Development of Biotechnology issued a

wide-ranging report on the future of biotechnology in the country. It calls on Chile to seize the opportunity to improve its competitiveness by applying biotechnology in its natural resource sectors. But it also calls for the development of a well-defined regulatory framework to reduce any associated risks.

Other recent developments suggest that biotechnology may be heading toward greater acceptance in Latin America. Brazil, Colombia, Costa Rica, Ecuador, Mexico, Peru, and Venezuela last year all signed the Cancún Declaration of Like-Minded Megadiverse Countries, along with China, India, Indonesia, Kenya and South Africa. The declaration recognizes “the urgent need to develop human resources, institutional capabilities, as well as an appropriate legal framework and public policies, to enable our countries to take an active part in the new economy associated with the use of biological diversity, genetic resources and biotechnology.”

In March 2004, Chile will host the world’s first Global Biotechnology Forum, cosponsored by the United Nations Industrial Development Organization (UNIDO) and the Chilean government. The event will bring together representatives of government, development agencies, industry, the scientific community and the public to discuss the challenges and opportunities of biotechnology in the developing world. For the countries of the Americas, it could signal a growing shift in focus toward how—not so much if—GM technology can be harnessed to benefit the region and its inhabitants.

*Donal Nugent, of Ireland, is the 2003 science journalism fellow at the Council for Agricultural Science and Technology in Washington, D.C.*

▲ Genetically modified corn dries on a stalk in a Midwestern cornfield. At least a quarter of all U.S. corn production is today GM.

## Meddling with maize?

As the transition point between temperate North America and neotropical Central and South America, Mexico is one of the world’s top countries in biodiversity. It is home to both modern varieties and wild ancestors of corn, sunflower, squash, cocoa, potatoes, tobacco, peppers, papaya and cotton. These are important in their own right but also as gene banks for new cultivated varieties in the future.

Mexico’s recent experience raises one of the most controversial issues in the debate over biotechnology: Could GM crops compromise biodiversity by introducing genes that would cause negative and unforeseen effects?

In late 2000, the journal *Nature* published a peer-reviewed paper stating that biotech corn had contaminated native corn species in Mexico. A storm of controversy followed, with environmental activists citing it as evidence of the inherent danger of biotech crops, while many scientists questioned the validity of the research presented in the paper. A few months later *Nature* took the unusual step of disavowing the paper.

Concerned that GM crops could cross-pollinate with native species, the Mexican government banned the planting of transgenic corn in 1998 and placed heavy restrictions on GM crop research conducted in the country. (The government permits the planting of GM cotton and soy as well as tomatoes, but these are not grown on a large scale.) Meanwhile, GM corn has crept into the Mexican diet through the more than 5 million metric tons of U.S. food corn—both conventional and GM varieties—that Mexico imports each year under the terms of the North American Free Trade Agreement.

The GM crop variety in question, known as Bt corn, incorporates a gene from the soil bacterium *Bacillus thuringiensis*, which produces a protein that kills the European corn borer, one of the most worrisome pests for U.S. farmers. It is less effective against other pests such as the corn earworm, which is common in Mexico. Parties on both sides of the GM debate now agree that transgenes from Bt corn have probably “introgressed” into Mexican corn, although the extent of this is still widely debated.

To address these issues, the U.S.-based Pew Initiative on Food and Biotechnology organized a conference in Mexico City in

**Biotech corn has probably left its mark on Mexican maize. How much this matters is up for debate.**

September on “Gene Flow: What Does It Mean for Biodiversity and Centers of Origin.” Among the presenters was Major Goodman, a professor of crop science and genetics at North Carolina State University, USA. Goodman told participants that if there is a “transgenic presence” in Mexican corn, it is unlikely to be a threat to the genetic diversity of Mexican landraces.

“Midwest Corn Belt Dent, probably the world’s most productive maize when grown in the U.S. Midwest, Chile or southern Europe, is useless in the tropics or subtropics, where it is unadapted and stress-, insect- and disease-prone,” he said. “Have transgenes been introduced to Oaxaca? Almost certainly. Have they survived? Very doubtful. Ask any experienced Mexican

maize breeder who has worked with U.S. maize in Mexico.” He added that the “lack of economic viability of small farmers is far more certain to erode Mexico’s maize diversity than is improved or transgenic maize.”

Wayne Parrott, a professor of crop and soil sciences at the University of Georgia, USA, has studied at close hand the relationship between Mexican farmers and their environment. He favors evaluation of GM crops on a case-by-case basis, but he argues that critics such as Greenpeace, who say GM crops are a threat to landraces, ignore the fact that plants have always traded their genetics through pollen transfer.

“When you hear some people, they’re talking as if these were museum pieces, something you have to keep in its original shape and not interfere with in any way. But the reality is these landraces are very dynamic, and they’re always changing from year to year,” he says.

Parrott and others say that for GM technology to be successful in countries like Mexico, more research is needed on the needs of local farmers. Cal Qualset, professor emeritus of agronomy at the University of California at Davis, estimates that 80 percent of Mexican cornfields are on small farms in mountainous areas. There, farmers typically use mixed cropping, with beans and squash as companion crops. In such areas, he says, GM varieties are inappropriate because they were developed for different climates, and the herbicides used with them would kill the secondary crops. He adds that biotechnology could play a useful role by modifying landraces to make them more valuable to farmers.

“Genes introduced to protect the maize from insect damage after harvest would have a very positive effect on the productivity and economics of poor farmers,” he says.



# PANAFTOSA Crusaders for Animal Health

by Alexandre Spatuzza



▲ The Pan American Foot-and-Mouth Disease Center, in the state of Rio de Janeiro, Brazil, is one of nine specialized centers of the Pan American Health Organization. Its work is part of PAHO's veterinary public health program.

The turn of the millennium brought little to celebrate for South America's livestock industry. In 2000–01, after a 10-year absence, foot and mouth disease (FMD)—one of the oldest and most feared threats to animal health—broke out in a leading meat-producing area, the River Plate Basin.

The debilitating and highly contagious disease reached more than 4,000 farms in northern Argentina, northern Uruguay and southern Brazil. More than 20,000 animals were slaughtered to control the outbreak. Thirty-five million dollars' worth of fresh meat exports

were cancelled, and millions more in potential sales were lost. Slaughterhouses and packing plants closed down, thousands of workers lost their jobs, and trade was disrupted in several other commodities.

A 2002 report by the Pan American Foot-and-Mouth Disease Center (PANAFTOSA) noted that investments in immunization, surveillance and prevention had declined in the preceding decade after the countries had been declared FMD-free. The lesson, says Eduardo Correa de Melo, PANAFTOSA's director, is that "every country is at risk of the introduction of foot-and-mouth disease as long as it is endemic in other countries where programs have not had the expected results. No country—no matter how isolated—can afford to let down its guard."

Founded in 1951, PANAFTOSA is one of nine specialized centers of the Pan American Health Organization (PAHO). Located in the Brazilian state of Rio de Janeiro, the center works to improve the control and eradication of animal diseases—primarily FMD, but also such threats as rabies, tuberculosis and most recently "mad cow" disease (see box p. 27).

In the past 50 years, PANAFTOSA has carried out research on new vaccines and diagnostic procedures, served as a catalyst for technology transfer to its member countries, and trained government and private sector workers throughout the Americas to set up and operate systems for animal disease surveillance and control. Through this work, the center has helped the region's countries develop their potential as meat exporters while also increasing production for domestic consumption.

With PANAFTOSA's help, the region's countries have dramatically reduced the incidence of FMD and are on track to eradicate the disease by 2009. It's a goal that requires not only technical expertise, but political will and international cooperation—along with the involvement of all the region's farmers, down to the smallest farm.

"It must be a joint effort," says Correa. "There must be solidarity with those that face the toughest problems. Animal health is not a problem for one country alone."

Look at a map of South America and Correa's meaning becomes clear. Many of the continent's border areas are remote and undeveloped, making them difficult to monitor.

Chile provides an example. The first South American country to be declared "FMD-free" back in the 1970s, Chile stopped vaccinating against the disease. This earned it the most coveted status in the international meat market, "FMD-free without vaccination," allowing it to ship its meat virtually anywhere in the world. But it also left Chilean livestock with no trace of immunity to the disease.

As a result of contact between Chilean and Argentine livestock grazing in upland pastures near the two countries' border in the summer of 1987, the disease once again broke out. PANAFTOSA consultant José Naranjo was one of 400 veterinarians and technicians who had to search the country for infected and exposed animals, calling the army in to kill and bury them. Nearly 35,000 head of cattle alone were slaughtered to save a national herd of 3.6 million. Thanks to



photo courtesy: PANAFTOSA

*PANAFTOSA has played a leading role in the region's battle against FMD. Now the goal of eradicating the disease is finally within sight.*

the drastic measures, Chile was able to halt the spread of FMD and was declared disease-free again by December of the same year.

"The positive result of this was a system to control the movement of animals and cooperation agreements with Argentina and Peru," Naranjo says.

## Haves and have-nots

Introduced into the Americas from Europe in the 1870s, FMD has at one time affected all of the Western Hemisphere except Central America. Today it remains endemic in Bolivia, Ecuador and Venezuela. All of North America, Central America and the Caribbean are disease-free without vaccination, along with Guyana, Chile and the Argentine Patagonia. Uruguay is

"free with vaccination," as are extensive areas of Colombia and Peru. More than 80 percent of Brazil's livestock is in FMD-free zones.

The designation of countries as FMD "haves" and "have-nots" has an enormous impact on trading patterns, with the Paris-based World Organization for Animal Health acting as referee. Known by its French initials, the OIE is responsible for classifying countries according to their foot-and-mouth-disease status. More than 50 of its 162 member countries have been declared FMD-free without vaccination, allowing them to sell their meat products around the world. Those with endemic disease or outbreaks face international bans on their suspect meat. But countries that are FMD-free with vaccination also face a disadvantage in the marketplace, as some countries restrict imports of their meat. While the OIE classification system has ensured transparency and helped protect disease-free countries from importing the virus, it has created a major disincentive for countries to use vaccination as a means of preventing the disease.

OIE rules were modified somewhat in the last decade to allow for FMD-free zones within affected countries, a change that favored Argentina, Brazil and Colombia, among others. Then last year, the organization adopted more profound changes that could have far-reaching results. For the first time, it recognized the concept of infection by

▲ Brazil boasts cattle herds that are among the world's most productive and highest quality. PANAFTOSA's technical cooperation has helped put the country on track to eradicate foot-and-mouth disease.



## ABCs of FMD

**F**oot-and-mouth disease (FMD) is a viral illness that rarely affects humans but causes fever, malaise and painful lesions in cattle, sheep, pigs and other livestock. In young animals, the disease can be fatal, while older animals suffer weight loss, slowed growth and reduced lactation. Outbreaks result in major losses in livestock and milk production.

Because FMD is highly contagious, "stamping out," or widespread culling of affected and exposed animals has been the preferred method for containing the disease. In the notorious 2001 outbreak in the United Kingdom and Ireland, for example, authorities ordered the slaughter of more than 4 million animals. But the images of cattle and sheep being herded into mass graves and of burning mounds of carcasses prompted criticism of the methods and a reexamination of outbreak response strategies that continues to this day.

"Massive sacrifice as the sole measure for eliminating the infection turned out to be extremely inefficient in terms of costs and benefits, environmental impact, public opinion and huge losses in other segments of the economy, such as tourism—not to mention the catastrophic effects in terms of animal welfare," says Eduardo Correa de Melo, director of the Pan American Foot-and-Mouth Disease Center (PANAFTOSA).

In South America, strategic—and much more limited—culling, coupled with vaccination, is the outbreak-control strategy of choice. Today most countries that have not yet eradicated FMD practice twice-yearly vaccination against the disease.

the FMD virus, as distinct from the presence of antibodies as a result of vaccination. It also reduced from two years to 18 months the time it takes for countries to regain FMD-free status after vaccinating but not sacrificing animals during an outbreak.

"These are positive developments," says Albino Belotto, head of PAHO's veterinary public health program in Washington, D.C. "In the past, stamping out without vaccination was the only way to assure rapid resumption of trade. Now countries can use emergency vaccination without sacrificing vaccinated animals, and then prove that the virus is not in circulation."



photo courtesy PANAFTOSA

The changes were made possible by recent scientific and technological breakthroughs, chief among them a new diagnostic system developed by PANAFTOSA. The system can detect antibodies to the FMD virus, distinguishing infected animals from those that have merely been vaccinated. The OIE has proposed that PANAFTOSA's diagnostic system be adopted as the standard "reference test" for the Americas.

The system, available since 1991, provides a major boost for FMD surveillance efforts, according to PANAFTOSA laboratory coordinator Ingrid Bergmann.

"It is not a disease-control tool as such, but it is a major help in manag-

ing vaccinated herds, gaining international recognition as being FMD-free, and guaranteeing domestic and international trade in meat products," Bergmann says.

An equally important PANAFTOSA contribution to the fight against FMD was its development in the early 1980s of a new oil-adjuvant vaccine, a true "disease-control tool" that confers longer-lasting immunity on animals, thus requiring less frequent vaccination than conventional vaccine.

"Earlier vaccines gave animals immunity for a maximum of four months," explains Bergmann. "That meant vaccinating three times a year, with the asso-

ciated costs of rounding up animals and giving the shots. The oil-adjuvant vaccine is given twice during an animal's first year and only once a year thereafter."

**P**erhaps PANAFTOSA's most important and enduring contribution was its leadership in developing the 1987 Hemispheric Plan for Foot-And-Mouth Disease Eradication. This continent-wide effort built on the center's work helping countries create national FMD-control programs in the 1960s and 1970s. It followed the establishment in 1973 of the South American Commission for the Fight Against Foot-and-Mouth

Disease (COSALFA), set up to coordinate international action. Through this and other multilateral forums, PANAFTOSA helped the region's countries organize their fight against FMD.

The results have been encouraging: FMD control programs were expanded from covering just 30 percent of the region's herds in the 1960s to some 85–90 percent of herds by the 1980s.

Chile, declared FMD-free without vaccination in 1981, became the first success story for these efforts. With PANAFTOSA's support, the country set up a complete surveillance and control system involving both the private and public sectors. The government

*The massive sacrifice of animals has proved to be highly inefficient in terms of costs and benefits, environmental impact, public opinion and losses in other segments of the economy.*

formed inspection teams, established international cooperation accords and provided mechanisms to cover farmers' eventual losses. Meanwhile cattle ranchers invested even more to train personnel and buy vaccines and related equipment.

The results have been sustained growth in both foreign exports and domestic production.

"Not only are meat and dairy exports to more sophisticated markets growing, but domestic Chilean meat consumption has doubled in the last two

decades," says José Naranjo. "PANAFTOSA had a vital role in this by transferring technology, training personnel and helping to create inspection teams."

Eyeing the benefits of dollar-denominated income in new markets, Brazilian farmers began organizing themselves in the 1980s.

"The national livestock council was created in 1982 and wanted to organize the whole meat production chain," explains João Meirelles, a Brazilian cattle rancher and former president of one of the country's cattle growers' associations. "This brought the country from being a net importer of meat in 1978 to being the largest exporter in the world in 2003."

While FMD is still present in some parts of Brazil, proponents of eradication believe their goal is well within reach. "It's becoming easier to do my job," says Dercio Gottardo, a veterinarian in São Paulo state's animal health department. "People are aware of the problem of FMD."

Yet challenges remain. Countries throughout the region face the common problem of "leaky borders," with most governments lacking the manpower to eradicate livestock smuggling. Universal tagging, which allows meat to be traced back to its animal and farm of origin, would help address this and other problems of disease control.

In a May 2003 meeting in Chile, COSALFA called on PANAFTOSA to begin supplying diagnostic kits for FMD surveillance, while seeking an outside partner capable of longer-term, larger-scale production. It also increased PANAFTOSA's power to "audit" countries' FMD status and called on the center to develop a new program to train technicians in monitoring animal health.

In March 2004, at the annual Houston Livestock Show and Rodeo in Texas, PAHO and the U.S. Department of Agriculture will host a Hemispheric Conference on the Eradication of FMD. The meeting is intended to galvanize wide, coordinated international action for the final push to eradicate the disease. A point of emphasis will be the need to further strengthen

## Keeping BSE at bay

**O**ne of the reasons why South American meat exports have increased dramatically in recent years is the emergence of bovine spongiform encephalopathy (BSE), or "mad cow disease." After first appearing in the United Kingdom in 1986, the fatal neurological disease has spread to more than a dozen countries in Europe, prompting bans on consumption and sale of suspect meat and boosting imports from unaffected countries.

In May of this year, authorities in Canada identified a single infected cow in the province of Alberta, and an investigation concluded that the likely source of infection was feed containing animal parts. To date, no other country of the Americas has reported a single case of BSE. To maintain that status, the Pan American Health Organization (PAHO) has helped its member countries set up a laboratory-based surveillance system.

The risk today is considered extremely low: the region has banned all imports of feed containing meat or bone meal and live animals from BSE-affected countries. As for South America, its best selling point remains that an estimated 95 percent of its livestock are pasture-fed.

prevention efforts based on surveillance and quarantine, along with vaccination.

João Meirelles notes that the efforts already undertaken in the past half-decade in Latin America have produced one of the most efficient disease surveillance networks in the world: "With this setup, we can now look at fighting other important animal diseases such as tuberculosis, rabies, brucellosis—and really move toward the ultimate goal, which is to have healthy animals in a healthy continent."

*Alexandre Spatuzza is a Brazilian freelance journalist living in São Paulo.*

▲ PANAFTOSA's work on vaccines and diagnostic systems, in addition to its help in setting up national control programs, has helped South American countries to reduce the incidence of foot-and-mouth disease dramatically.





# Purple Death

## The Great Flu of 1918

by Sara Francis Fujimura

**U.S. AT WAR. MYSTERY VIRUS LEAPS AROUND THE GLOBE KILLING SCORES IN ITS PATH. SCIENTISTS RACE TO FIND A CURE.**

**Not headlines from March 2003, but from 85 years earlier. In 1918, hundreds of thousands of American troops headed to Europe for the closing offensives of World War I.**



photo © Ohio Historical society

**M**eanwhile back home, schoolgirls jumped rope to a new chant:

*I had a little bird  
And its name was Enza  
I opened the window  
And in-flew-Enza*

Influenza—more specifically the Spanish flu—left its devastating mark in both world and American history that year. The microscopic killer circled the entire globe in four months, claiming the lives of more than 21 million people. The United States lost 675,000 people to the Spanish flu in 1918—more casualties than World War I, World War II, the Korean War and the Vietnam War

combined. Pharmaceutical companies worked around the clock to come up with a vaccine to fight the Spanish flu, but they were too late. The virus disappeared before they could even isolate it.

*America's Forgotten Pandemic: The Influenza of 1918*, by Alfred Crosby, tells the chilling story of the world's deadliest flu pandemic from a U.S. perspective and also offers many details of the epidemic's international reach. The book was first published in 1990, but following the emergence of severe acute respiratory syndrome (SARS) earlier this year, it was rereleased in paperback in September with a new preface.

Crosby's book and other treatments of the 1918 pandemic (see box at end) make enlightening—if alarming—reading as the Northern Hemisphere's new flu season gets under way.

**D**espite its name, researchers believe the Spanish flu most likely originated in the United States. One of the first recorded cases was on March 11, 1918, at Fort Riley in Kansas. Overcrowding and unsanitary conditions created a fertile breeding ground for the virus. Within one week, 522 men had been admitted to the camp hospital suffering from the same severe influenza. Soon after, the army reported similar outbreaks in Virginia, South Carolina, Georgia, Florida, Alabama and California. Navy ships docked at East Coast ports also reported outbreaks of severe influenza and pneumonia among their crews. The flu seemed to target military personnel and not civilians, so the virus was largely overshadowed by hotter current affairs such as Prohibition, the suffragette movement and the bloody battles in Europe.

By May 1918, influenza began to subside in the United States. But the ordeal was by no means over. Soldiers at Fort Riley, now ready for battle, incubated the virus during their long, cramped voyage to France. Once they hit French shores, the virus exploded, striking the Allied forces and Central Powers with equal force. The Americans fell ill with “three-day fever” or “purple death.” The French caught “purulent bronchitis.” The Italians suffered “sand fly fever.” German hospitals filled with victims of *Blitzkatarrh* or “Flanders fever.”

No matter what they called it, the virus attacked everyone similarly. It started like any other influenza case, with a sore throat, chills and fever. Then came the deadly twist: the virus ravaged its victim's lungs. Sometimes within hours, patients succumbed to complete respiratory failure. Autopsies showed hard, red lungs drenched in fluid. A microscopic look at diseased lung tissue revealed that the alveoli, the lungs' normally air-filled cells, were so full of fluid that victims literally drowned. The slow suffocation began when patients pre-

sented with a unique symptom: mahogany spots over their cheekbones. Within hours these patients turned a bluish-black hue indicative of cyanosis, or lack of oxygen. When triaging scores of new patients, nurses often looked at the patients' feet first. Those with black feet were considered beyond help and were carted off to die.

What made this influenza especially baffling to health care workers was that it attacked healthy, strong adults most often. Normally, flu is only life-threatening to the elderly, young children and people with compromised immune systems. Many adults become sick, but very few die. Spanish flu turned the tables on this pattern. Disproportionate numbers of men and women—especially pregnant women—died, leaving their orphaned children behind.

### The Spanish lady

Spanish flu, sometimes called the “Spanish Lady,” received its misnomer thanks largely to wartime censorship. Both the Allied forces and Central Powers had amassed huge losses due to Spanish flu, but the warring parties stifled reports to hide information that could be valuable to the enemy. However, uncensored newspapers in Spain openly reported the deaths from flu of millions of Spaniards in May and June of 1918—reports that were picked up by media around the world. Spain, outraged at the unflattering epithet, pointed its finger at France, saying the disease had come from its battlefields and had flown over the Pyrenees mountains carried by the wind. The misnomer, however, endured.

From the battlefields of Europe, the epidemic quickly evolved into a pandemic, as the disease spread north to Norway, east to China, southeast to India and as far south as New Zealand. Even islands weren't safe. Hitching rides on naval ships and carriers, merchant vessels and trains, the virus traveled to the four corners of the earth. By the summer of 1918, it had hit Puerto Rico, the Caribbean, the Philippines and Hawaii. The epidemic wreaked havoc on Puerto Rico but surprisingly barely touched the Panama Canal Zone, the

crossroads of the world at the time. The steamship *Harold Walker* is blamed for bringing Spanish flu to Tampico, Mexico. Within four short months, the virus had rounded the globe and returned once more to U.S. shores.

The second and third waves of Spanish flu slammed the United States in the cold-weather months of 1918. This time civilians were not immune. The country's indigenous people, particularly Native Alaskans, suffered disproportionately. The flu completely wiped out some villages in Alaska, and others lost most of their adult population. Big-city dwellers fared poorly too. New York City buried 33,000 victims. Philadelphia lost nearly 13,000 people in a matter of weeks. Overwhelmed with bodies, many cities soon ran out of coffins and some had to convert streetcars into hearses to keep up with demand.

Crosby described how overburdened undertakers were:

In some cases the dead were left in their homes for days. Private undertaking houses were overwhelmed, and some were taking advantage of the situation by hiking prices as much as 600 percent. Complaints were made that cemetery officials were charging fifteen-dollar burial fees and then making the bereaved dig the graves for their dead themselves.

Life came to a standstill in some parts of the United States. Boston officials closed public schools, saloons and soda shops. Chicago police officers were ordered to arrest anyone sneezing or coughing in public. In Nashville, all public gatherings—including in movie houses, dance halls and pool parlors—were prohibited. Even ministers were ordered not to hold church services.

Crosby details the desperation: “Many families, especially in the slums, had no adult well enough to prepare food and in some cases had no food at all because the breadwinner was sick or dead.”

Jeffery Taubenberger, chief of cellular pathology and genetics at the U.S. Armed Forces Institute of Pathology and a world-renowned leader in Spanish

▲ Lung and brain tissue samples from victims of the 1918 influenza pandemic rest atop a list of child victims. Estimates of the number of deaths from the pandemic range from 21 million to 50 million worldwide.



flu research, estimates that about a third of the U.S. population was infected with Spanish flu. “There was a massive shortage of medical care of all kinds,” he says.

Many cities’ health care services were already overtaxed by the war. For example, one-third of Nashville’s doctors were treating service people overseas when Spanish flu hit. Nurses became an invaluable asset to communities as the remaining doctors quickly became overwhelmed and in many cases sick themselves with the Spanish flu.

Crosby describes the horrors facing nurses, some fresh out of school and with little practical experience:

Visiting nurses often walked into scenes resembling those of the plague years of the fourteenth century...One nurse found a husband dead in the same room where his wife lay with newly born twins. It had been twenty-four hours since the death and the births, and the wife had had no food but an apple which happened to lie within reach.

Every year, the world catches a new influenza virus. Many people become infected, and many die. But what made the 1918 pandemic so particularly deadly? Like other viruses, the influenza virus changes constantly. This mutation, or antigenic drift, normally causes only minor changes, so pharmaceutical companies are able to counteract each year’s strain with the proper flu vaccine. However, as historical records dating from the 1700s show, every 10 to 40 years the world suffers a global flu pandemic, the result of a major antigenic drift. The virus mutates so much that the human body no longer recognizes it and is left defenseless. The resulting epidemic spreads faster than scientists can isolate, produce and distribute a vaccine. This is what happened in 1918.

“History tells us we are ready for another pandemic,” says Kirsty Duncan, Spanish flu researcher and author of *Hunting the 1918 Flu: One Scientist’s Search for a Killer Virus*. “In many ways we are even more vulnerable now than in 1918. We travel and tour the world



photo © Bertram/Corbis

more. You can travel from one continent to another in a matter of hours now. Someone unknowingly harboring a disease can bring it from one country to another, passing the disease along to other travelers before they ever show signs of the disease.”

Would the world be able to cope with another flu pandemic? Yes, says Robert Webster, chief virologist at St. Jude Children’s Research Hospital and an expert on influenza. He cites Taubenberger’s pioneering work in developing new techniques for analyzing genetic changes in influenza viruses. His findings suggest that “should something like the Spanish flu return, today’s flu drugs—Tamiflu, Flumadine, Symmetrel, and Relenza—would all be effective,” Webster says, adding: “With today’s technology to add to Taubenberger’s results, drug companies could get a vaccine ready very quickly.”

What about a new, non-influenza virus, like the one that causes SARS?

“Quarantine and hygiene put the SARS virus back in the bottle,” says Webster. “It would not have been possible to do so with an influenza. It would travel too fast to be contained by quarantine and hygiene alone.”

▲ In Tokyo, schoolgirls wear face masks to protect them from the Spanish flu virus. Experts say a new mutant influenza strain like the one that caused the 1918 pandemic would likely spread much faster than the coronavirus that caused SARS.

*America’s Forgotten Pandemic: The Influenza of 1918*  
by Alfred W. Crosby, Cambridge University Press (paperback, September 2003)

*Hunting the 1918 Flu: One Scientist’s Search for a Killer Virus*  
by Kirsty E. Duncan, University of Toronto Press (hardcover, May 2003)

*Flu: The Story of the Great Influenza Pandemic of 1918 and the Search for the Virus That Caused It*, by Gina Kolata, Simon & Schuster Adult Publishing Group (paperback, January 2001)

For children:  
*Influenza Pandemic of 1918–1919*, by Virginia Aronson, Chelsea House Publishers (hardcover, March 2000)

*Purple Death: The Mysterious Flu of 1918*, by David Getz, Henry Holt & Co. (hardcover, September 2000)

Sara Francis Fujimura is a freelance writer based in Arizona, USA. She is currently at work on a young adult novel set during the 1918 flu outbreak in Nashville, Tennessee.

# Mailbox

## Health for all

✓ Your article “Alma-Ata Revisited” (Vol. 8, No. 2) brought back many memories of my work at the World Health Organization during that period. It is true that even proponents of the goal of “Health for All” underestimated the efforts needed for its achievement and that the primary health care strategy was distorted by international agencies’ desire for quick results. There are no quick fixes for achieving a sustainable impact on the health care systems and people’s health.

As director of WHO’s Health for All Strategy Coordination, I too was disappointed when this vision faded after WHO’s change of leadership in 1988. So much invested effort was lost. I agree that a new vision for health is needed today—one based on integral health, encompassing its physical, social, mental and spiritual dimensions, and with a strong emphasis on individual and collective responsibility.

We know much more about how health is created, destroyed and protected today than we did in 1978. We have much more technology for health and for information dissemination to the remotest places. With chronic diseases increasing and health care costs soaring, it is even more imperative now for international health leaders to formulate a new vision for health. I hope they respond to this challenge.

*Sumedha Khanna*  
*Executive Director, Healing Well*  
*Gualala, California, USA*

✓ I agree with David Tejada’s argument in “Alma-Ata Revisited” that it is imperative to transfer the power of decision-making on issues of social importance to the citizenry. One of the best contributions to this process in our region has been Brazil’s National Health Conferences. Since their inception in 1941 these have served as a forum for debate on important proposals in the area of health. They have benefited from consistent and growing social participation and from the excellent technical support of Brazilian professionals and institutions directly or indirectly involved in the health sector.

The discussions and the political work of these conferences were instrumental in getting Article 196 incorporated into Brazil’s constitution. It reads: “Health is the right of all and the duty of the state, guaranteed through social and economic policies

designed to reduce the risk of disease and other health problems, which ensure universal and equal access to actions and services for the promotion, protection and recovery of health.”

These conferences have contributed to the search for equity and improvements in population health and to the development of health services, thanks to the participation of a society capable of putting essential values before a plurality of interests. It is imperative to continue joining forces to achieve health for all, without exclusions.

*Florentino García Scarponi*  
*Pan American Health Organization*  
*Buenos Aires, Argentina*

## The power of telenovelas

✓ Your article “Love, Tears, Betrayal...and Health Messages” (Vol. 8, No. 2) cites the work of Brazil’s TV Globo in addressing social and health issues through its telenovelas. The “silent partners” in this social merchandising initiative are the U.S.-based Population Media Center and Comunicarte of Rio de Janeiro. The two organizations work together with TV Globo writers to assist with ideas for social content, and project staff provide pro bono research on the themes being addressed.

In Mexico, the Population Media Center works with CORA (Centro de Orientación Para Adolescentes) to support youth-run radio melodramas and talk shows that address adolescent pregnancy prevention and sexual and reproductive health issues. Already piloted in three Mexican states, the youth-written and produced programs have proven to be wildly popular with adolescents.

Entertainment-education works not only because the entertainment quality leads to large audiences but also because of the shows’ emotional content. Most human behaviors, including those that are health-related, are rooted in values that are more affected by emotions than by information. Melodrama is a perfect medium for reaching the emotions and motivating change.

*William N. Ryerson*  
*President, Population Media Center*  
*Shelburne, Vermont, USA*

## Essential patents

✓ Martin Foreman’s article on TRIPS and essential drugs (Vol. 8, No. 1) deals with the serious problem of access to health care in the developing world. Unfortunately, like many others, Foreman simply scapegoats the intellectual property system. This ignores the real causes of inadequate health care provision in poor countries while undermining one of the pillars of technological progress and improved living conditions.

The patent system is crucial in providing incentives for the development of new technologies, including new drugs. Indeed, many drugs might have never been created in the absence of the patent system. Moreover, studies show that 95 percent of the World Health Organization’s list of essential drugs are off-patent, but still they don’t reach the world’s poor. Patents, then, are not the cause of the problem.

Foreman offers a very precise description of some of the practical problems of health care in the developing world, but none of these problems has anything to do with the patent system. Rather, they arise from governmental inefficiency (often accompanied by corruption) in the administration of health care systems.

The improvement of health conditions in the Third World is a goal shared by all mankind. However, only a serious and deep analysis of the real causes of poor health care in developing countries can help us find the way.

*Andrés Mejía-Vergnaud*  
*Director General, Instituto Desarrollo y Libertad*  
*Bogotá, Colombia*

**Correction:** A quote on page 24 of “Cuba’s Jewel of Tropical Medicine” (Vol. 8, No. 2) presents rates of typhoid, tuberculosis and bacterial meningitis as percentages. The rates are in fact per 100,000 people.

We encourage readers’ comments on articles in *Perspectives in Health* and on the issues they raise. Letters to the editor may be sent by e-mail to eberwind@paho.org.



# There is a Cure for Discrimination

by Carol Vlassoff

**S**ince the beginning of the AIDS epidemic, people living with HIV have suffered not only the direct effects of the illness but also the added burden of stigma and discrimination.

Men and women around the world have lost their jobs, their homes and the support of their friends and families as a result of others learning they are HIV-positive. Many have been verbally and physically attacked, and a few have even lost their lives.

As a newly published study from the Pan American Health Organization (PAHO) reveals, people with HIV have also faced discrimination in the health sector from those who have the social responsibility to take care of them and ensure their well-being.

Such discrimination can take many forms. It can range from violations of confidentiality to verbal assaults and other forms of mistreatment. A patient in Bolivia learned that he had contracted the virus when a doctor shouted at him in the waiting room: "You've got AIDS. Now you're going to die." In some cases, health workers have revealed the results of an HIV test to others without the patient's permission, an unacceptable practice.

In other instances, people with HIV have faced delays in or withholding of treatment. Reports from several countries in the Americas and elsewhere have confirmed that people with HIV have often been refused counseling or denied

even inexpensive treatment for opportunistic infections. One health worker was quoted as saying there was no point in offering treatment because the patient was "going to die soon."

Acts of discrimination, whether overt or subtle, can have a significant physiological or psychological effect on those at whom they are directed. Over the 20 years since the disease was first identified, the actions—or inaction—of health workers have seriously affected the lives of hundreds of thousands, and perhaps millions, of people across the globe.

There are many reasons why some health service workers react so negatively toward people with HIV. They may hold negative attitudes based on what they know or assume to be the client's sexual or drug-taking behavior. They may be poorly trained. They may be under severe stress from working in an environment with inadequate resources, where the most appropriate treatment is not available.

HIV/AIDS-related stigma feeds off and adds to other kinds of stigma. Women with the virus are often assumed to be "promiscuous." Gay men and transgender individuals are particularly affected. One man in Chile who began treatment when married and a father of two found that health workers' attitudes toward him deteriorated significantly when he became openly homosexual.

But to effectively combat discrimination, we need more and better information about it. There have been some studies of discrimination in the health services, but overall, research in this area is limited. We know that many people with HIV/AIDS have negative experiences in health care settings, but we do not know if they are the minority or the majority. We don't know what proportion of health workers hold discriminatory attitudes or how often such attitudes translate into discriminatory behavior. There are reports that discrim-

ination is decreasing, but we do not have the evidence to confirm this. In other words, we know there is a problem, but we do not know how big it is or where it is most acute. For public health, these are key questions that must be addressed in formulating an effective response.

As a first step, we must restate our respect for the dignity and human rights of all individuals. We must ensure that all health workers have the appropriate knowledge and skills to deal with people with this disease. We must restate and adhere to the appropriate ethical guidelines—and modify those guidelines where circumstances demand it.

It is important to address the needs not only of people with HIV/AIDS but also of our fellow health workers, in particular those who face the daily stress of dealing with patients who are severely ill and who may die in the prime of their lives. We should establish partnerships with organizations of health workers and people with HIV/AIDS. We can offer training, and we can identify systematic weaknesses in clinics, hospitals and other medical settings that allow discrimination to occur.

Those of us working in the health sector, whatever our role, have a particular duty to support people suffering from any disease, especially one as traumatizing as HIV/AIDS. We cannot allow stigma and discrimination to prevent us from fulfilling this duty. If we can overcome HIV/AIDS-related discrimination in the health services, all of us—patients and health workers alike—will be changed for the better.

*Carol Vlassoff is chief of the Pan American Health Organization's HIV/AIDS unit. The PAHO report Understanding and Responding to HIV/AIDS-related Stigma and Discrimination in the Health Sector is available at [www.paho.org](http://www.paho.org).*

# discrimination

## If it doesn't raise your blood pressure, get a checkup

Discrimination is a problem that affects all society. Within the health services, people with HIV and other diseases are sometimes affected by discrimination. Check for these symptoms of discrimination:

- Refusal to admit patients to health care facility
- Delayed treatment
- Other forms of care (e.g., food, hygiene) delayed or withheld
- Premature discharge of patients
- Testing without consent
- Breach of confidentiality within or outside the health care system
- Inappropriate comments or behavior (e.g., shouting, rudeness)
- Use of excessive precautions

**Health workers: partners in the fight against discrimination**



**Pan American Health Organization**

Regional Office of the World Health Organization





© Sebastião Salgado/Amazons - Contact Press Images

Indian children disabled by polio and other diseases take part in occupational and physiotherapy at the Amar Jyoti Rehabilitation and Research Center in New Delhi. India is one of only seven countries where polio is still endemic. As part of the Global Polio Eradication Initiative, the country organized the largest mass immunization campaign in history in February of this year. More than a million teams of volunteers and health workers delivered oral polio vaccine to more than 165 million children in just six days. Photographer Sebastião Salgado shot this photo as part of a series documenting the polio eradication drive, published earlier this year in *The End of Polio: A Global Effort to End a Disease* (see story page 10).