Healer Needed for World Health Body

As the World Health Organization (WHO) prepares to choose a new leader, public health experts are hoping for somebody who will bring a new vision to an agency that many think has lost its way

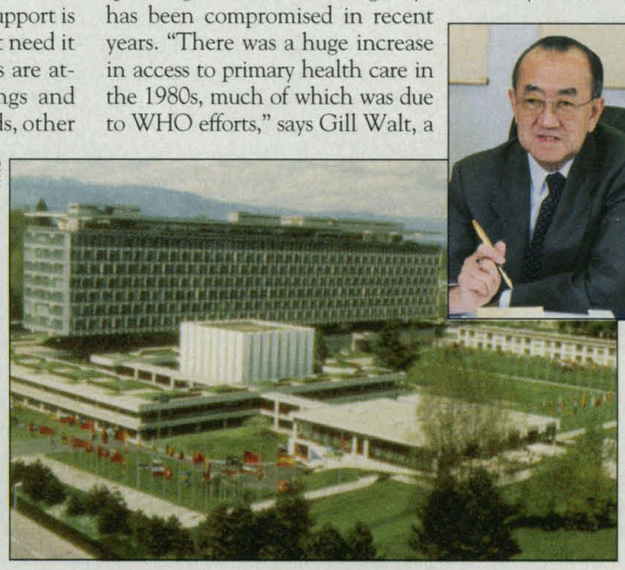
GENEVA—On 19 January, the executive board of the World Health Organization (WHO) will convene in this lakeside city for what may be the most important meeting in the agency's 50-year history. The 32-member board, made up of representatives from WHO's 191 member countries, will nominate a new director-general to carry the organization into the 21st century. The new leader will replace Hiroshi Nakajima of Japan, whose 10-year stewardship of WHO comes to an end in July.

The election comes at a critical turning point for WHO. The world's health landscape has changed over the past decade, and yet many believe the agency has not changed with it. Its narrow, disease-based approach is sometimes seen as too simplistic; its support is not always going to the countries that need it the most; and while member nations are attempting to interfere in its workings and some are arbitrarily withholding funds, other agencies not usually connected with health are muscling in on its territory. Such problems have mounted in recent years, and health experts both within WHO and outside it believe that the new director-general will need to create a new vision for the organization to get it back on track.

When WHO was established in 1948 as the United Nations (U.N.) agency chiefly responsible for safeguarding the world's health, it had two primary missions: to create and disseminate international health regulations and guidelines, and to provide expert technical assistance and emergency relief to its member countries. In addition to these advisory roles, the organization has coordinated international research efforts in a number of health-related areas, such as contraception methods, AIDS, toxic chemicals, and the health effects of radiation from Chernobyl and other nuclear accidents.

For many years, this straightforward biomedical approach worked well and led to some of WHO's greatest triumphs—particularly the much-heralded eradication of smallpox in the late 1970s. But more recently, international health issues have become increasingly complex, as economic and political factors—including the ravages of wars, particularly in Africa, that have wiped out entire health care infrastructures—have led many to question WHO's traditional approach. Many critics believe that WHO must be a greater advocate against poverty and the social conditions that contribute to poor health, especially in developing countries.

"We have been presiding over increasing health inequities, and in many cases worsening health situations, particularly linked to poverty," says John Martin, a senior official in a WHO division established in 1990 to help concentrate more of the organization's multidisciplinary talents on the poorest nations. While WHO's public health experts and others outside the agency do not always agree on what WHO's priorities should be, there is widespread agreement that the agency's credibility has been compromised in recent years. "There was a huge increase in access to primary health care in the 1980s, much of which was due to WHO efforts," says Gill Walt, a health policy analyst at the London School of Hygiene and Tropical Medicine. "But as recession hit and public spending began shrinking, the agency was still looking at technical issues in health and disease, and didn't take on the question of how to finance increasingly stretched health infrastructures."



WHO

Visionary wanted. A new leader will take over from Hiroshi Nakajima *(inset)* at WHO's sprawling Geneva headquarters.

This task, Walt and others say, fell by default to other agencies not traditionally concerned with health, such as the World Bank, which have stepped in to fill the gap. While WHO itself does not have the funds to provide such financing, some observers believe that the organization has ceded much of its leadership role in defining what the health priorities should be. "Many people are worried that WHO has lost its lead role in many areas," says Wilfried Kreisel, the agency's executive director for health and environment. James Sherry, a health analyst with the U.N. Children's Fund currently serving as an adviser to UNAIDS, the multiagency U.N. body responsible for coordinating the worldwide fight against AIDS, adds that "in the absence of sharp leadership at the top, WHO has reverted to what it draws the most comfort from—printing out guidelines in the headquarters basement and sending them out to 150 countries."

After Nakajima

For most of WHO's staff, as well as public health experts and other observers outside the agency, restoring the organization's credibility will be one of the highest priorities for the new director-general. "It's tough right now to keep moving forward," says Susan Holck, director of WHO's reproductive health division. "There's nothing holding us together except our commitment to the organization and its work." WHO staff members are therefore anxiously waiting to see who their new leader will be. This month's executive board meeting will pick a sole nominee from among seven candidates vying for the position (see sidebar on p. 167). That person will almost certainly be elected when all of WHO's member states meet for the World Health Assembly next May, and will take office on 21 July.

As the suspense mounts, there is a palpable sense of relief that the Nakajima era is coming to an end. While some feel that the outgoing director-general has often been unfairly criticized, the last decade has been marked by accusations of financial irregularities and questionable awards of contracts by top officials, and many say that Nakajima's bureaucratic management style has compromised WHO's ability to respond to pressing health problems around the world. For example, one of WHO's most important programs—its new division of emerging and communicable diseases, created in late 1995 and devoted to controlling frightening new viral diseases such as Ebola and Lassa as well as more well-established killers like cholera—came into existence only after overcoming considerable bureaucratic resis-

Who Will Lead WHO?

GENEVA—Ask public health experts what qualities they would like to see in the next director-general of the World Health Organization (WHO), and one answer almost always comes up first: charisma. After 10 years of what is widely perceived as lackluster leadership from current chief Hiroshi Nakajima, whose tenure expires on 20 July, the international public health community is eager to see a visionary take his place. Yet, there is an undercurrent of fear that when the WHO's 32-member executive board meets later this month, the regional rivalries and horse trading that often mark United Nations (U.N.) politics will play a hand in the selection of the WHO's new leader. While seven candidates are vying for the job, observers within and outside the WHO say that four are clear front-runners:

Gro Harlem Brundtland

Nafis Sadik

Ebrahim Malick Samba

George Alleyne

Gro Harlem Brundtland. The former prime minister of Norway, Brundtland is an energetic campaigner on environmental and economic development issues. She is also favored by most of WHO's staff, chiefly because she hails from outside the U.N. system. One handicap: Although she is a physician, Brundtland has little public health experience. In an interview with *Science*, Brundtland stressed the relation between health and development issues: "Not only does poverty breed ill health, but ill health breeds poverty. Investing in health increases productivity and economic output."

Nafis Sadik. A former obstetrician from Pakistan, Sadik has been executive director of the United Nations Population Fund since 1987. She is an outspoken advocate for women's reproductive rights and played a leading role at the Cairo conference on population and development in 1994. Chief handicap: She has already spent 10 years as head of a U.N. agency. But Sadik does not see that as a minus: "I have been working in public health all my life. It takes years to understand the U.N. system."

Ebrahim Malick Samba. WHO's regional director for Africa since 1995, Samba, a physician from The Gambia, is noted for leading a highly successful campaign against onchocerciasis (river blindness) in Africa during the 1980s and '90s. Samba, who has the solid backing of the nations of sub-Saharan Africa, would be WHO's first director-general from the developing world. "WHO's budget is not distributed according to greatest need, but according to a formula no one seems to understand," he says. If chosen, Samba promises to set up a commission to rectify this.

George Alleyne. A physician from Barbados, Alleyne is director of the Pan American Health Organization, which doubles as the WHO regional office for the Americas. Alleyne scores a lower charisma rating than his three chief competitors, but is well respected for his integrity and management skills. "Anyone who goes into an organization saying he's going to change everything is a fool," Alleyne says. "But we are dealing with the perception that WHO has lost some of its credibility, and we must change that perception."

The remaining three candidates—**Fernando Antezana** of Bolivia, WHO's deputy director-general in Geneva; **Arif Batayneh**, former health minister of Jordan; and **Uton Muchtar Rafei** of Indonesia, head of WHO's regional office for Southeast Asia—are considered long shots by virtually all commentators who spoke to *Science*. But some observers expressed concern about what they call the "nightmare scenario": The executive board, which is made up of representatives roughly split between developed and developing nations, might pick a compromise candidate of lower stature. "It would be absolutely naïve to think that geopolitics will not play an important role in the election of the new director-general," says Jaime Sepulveda, director-general of the National Institute of Public Health in Cuernavaca, Mexico. And immunologist Barry Bloom of the Albert Einstein College of Medicine in New York City admonishes: "If they pick a candidate for reasons that have nothing to do with health, that would be shameful." **–M.B.**

tance. "It took 3 years for WHO to respond to this new and important area," says Jonathan Mann, dean of the Allegheny University School of Public Health in Philadelphia. "Nakajima had to be dragged into it."

Mann, who in 1990 resigned as director of WHO's Global Program on AIDS, the forerunner to UNAIDS, in protest at what he saw as Nakajima's lack of commitment to the fight against the disease, says that Nakajima made "conformism and loyalty the highest value" within WHO: "What mattered most was fealty to the leader and not to the organization." Indeed, a key reason for the creation of the multiagency UNAIDS program was the widespread perception that WHO's approach to the disease was unimaginative and narrowly focused (*Science*, 25 November 1994, p. 1312). However, some commentators told *Science* that the focus on Nakajima's perceived weaknesses has oversimplified the issues facing WHO. "I think that history will treat Dr. Nakajima's stewardship much more kindly than most people do now," says George Alleyne, director of the Washington-based Pan American Health Organization and one of the candidates to succeed Nakajima. Sherry adds that "Nakajima didn't elect himself. This is not basically a failure of internal leadership, but of governance" by the member states that make up WHO.

Meddling in management

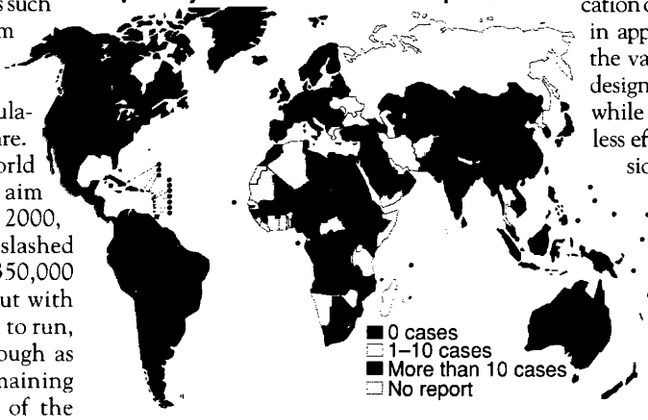
The often ambivalent attitude of WHO's member countries toward the organization may help explain many of the agency's problems. "The member states have the paradoxical tendency to micromanage parts of the organization, while at the same time abdicating their responsibilities for difficult issues that are vital for the organization as a whole," says Peter Piot, executive director of UNAIDS. One WHO program director, who asked not to be identified, says that "the way some member state representatives behave leaves a lot to be desired. They pass resolutions in the World Health Assembly saying people should be hired on merit, and then during the coffee break they try to push program directors to hire people from their countries."

At the same time, the member countries have kept WHO closely reined in by freezing its core budget for the past 15 years. Thus, the organization's regular budget for 1998–99—

Hunting Down the Last of the Poliovirus

GENEVA—One early morning last month, millions of people across India, from the snow-peaked Himalayas to the deserts of Radjastan, set off by foot, camel, bike, car, or helicopter to run polio vaccination posts in 650,000 Indian villages. By the time this army of volunteers arrived home at the end of the day, 127 million children under the age of 5 had been immunized against this crippling disease. "Everybody said it just couldn't happen. And, yet it does," says Harry Hull, chief of the World Health Organization's (WHO's) Polio Eradication Program. Indeed, while WHO's headquarters is preoccupied with the coming vote for a new director-general (see main text), initiatives such as the Polio Eradication Program show that WHO's foot soldiers can make a huge difference to the majority of the world's population without adequate health care.

Since 1988, when the World Health Assembly declared its aim to eradicate polio globally by 2000, the number of cases has been slashed by 90%, from an estimated 350,000 cases to about 35,000 today. But with just 3 years of the initiative left to run, the job will get increasingly tough as health workers track down remaining pockets of the virus in some of the most remote, poor, and war-torn corners of the globe. "This is one we can win," says Steve Cochi, director of polio eradication activities at the U.S. Centers for Disease Control and Prevention (CDC) in Atlanta. He says the Polio Eradication Program "can make people who work in public health feel like they can do something meaningful."



SOURCE: WHO

Lurking menace. WHO hopes to wipe out these lingering pockets of polio by 2000.

At first, the campaign to rid the world of a disease that has left some 10 million to 20 million people paralyzed did not seem to be making an impact. But in 1995, WHO and its partner, the United Nations Children's Fund (UNICEF), adopted the new strategy of blitzing the entire child population of a country in a single day. In 1996, such National Immunization Days vaccinated more than 420 million children—almost two-thirds of the world's children under five—against polio. These dramatic campaigns captured the imagination of the world and have even persuaded hardened fighters in war-torn countries such as Afghanistan, Sudan, and Sri Lanka to stop fighting for a day so that their children can be immunized.

In these campaigns, which are coordinated by WHO, the other main partners have different but complementary functions. UNICEF provides the oral polio vaccine, the CDC offers technical expertise, and the charity Rotary International, which has contributed $400 million to date, mobilizes millions of volunteers to carry out the mass immunization campaigns.

Only a small number of diseases are suitable for such an eradication program. Polio is a perfect candidate because the virus infects only humans, is carried in the body for a short period of time, and has an effective intervention. "We have great vaccines against polio," says Hull. The WHO-led campaign uses the live, attenuated oral polio vaccine developed by Albert Sabin in 1961, rather than Jonas Salk's 1955 inactivated injectable vaccine, because it is cheap—8 cents a dose—can be easily administered by mouth by an untrained volunteer, and produces high levels of intestinal immunity which blocks the replication of the disease. Its disadvantage is that in approximately one in 3 million cases the vaccine will produce the disease it is designed to prevent. The Salk vaccine, while it protects a child from paralysis, is less effective in preventing the transmission of the wild virus. "We do not think that, in the world as we know it today, eradication of wild poliovirus is possible with the Salk vaccine," says Hull.

As the possibility of eradication nears, the campaign's partners know that failing to wipe out the virus would make all their efforts thus far futile. If not treated, the last pockets of the virus could quickly spread again. "The poliovirus is one day's journey from any spot on the globe," says Hull. "So, countries that have been free of polio for years must continue immunization until the entire world is free of polio." The United States, for example, spends $230 million annually immunizing children for a disease it has been free of for 20 years. Eradicating polio will save an estimated $1.5 billion in immunization, treatment, and rehabilitation around the globe every year. WHO estimates that between $600 million and $800 million will be needed to complete the job of eradicating polio by the turn of the century.

Buoyed by their anticipated success, WHO and its collaborators have started planning a new campaign to eliminate measles, one of the world's five major child killers. Such a campaign will be much more difficult than eradicating polio, because an injectable vaccine will have to be used. But the team is convinced that, with determination and strong, committed leadership from WHO's new director-general, WHO could begin the new millennium with another remarkable public health achievement in sight.

–Lisa Schlein

Lisa Schlein is a journalist in Geneva.

which comes from mandatory member contributions—will be only $843 million, roughly equal to the operating expenses of a medium-sized teaching hospital in an industrialized country. And this modest pie must be divvied up among some 15 major WHO programs, ranging from nutrition and food safety to communicable disease control. To make ends meet, most WHO programs cover part, or sometimes most, of their costs by seeking so-called extrabudgetary funds, from individual donor countries or other agencies. These extra contributions will make up an additional $958 million in 1998–99, or 53% of WHO's total spending. "The current proportion of the budget earmarked for specific programs is way too high," says Jaime Sepulveda, director-general of the National Institute of Public Health in Cuernavaca, Mexico.

To make matters worse, some member countries have recently expressed their displeasure with WHO's management by withholding funds from programs generally regarded as worthy of support. "We have lost considerable contributions," says Paul Van Look, associate director of a special program on human reproduction re-

search—some from countries known to be sympathetic to the program's goals. For example, Sweden, formerly one of the biggest contributors to the program, has drastically cut its donation, and Denmark—another major donor—has cut its subsidy entirely. An official of the Danish foreign ministry told *Science* that Denmark would not increase its donations to WHO programs until a new director-general was elected.

WHO resources have been further stretched by the failure of many rich Western countries to pay their membership dues on time, while some of the poorest countries in the world, including Rwanda, have managed to do so. Thus, the United States, the single biggest contributor, was nearly a year late paying its 1997 allotment of $107 million and still owes money from 1996. (A few countries, including Costa Rica and Bhutan, paid their 1998 dues months in advance.) But perhaps of greater ultimate concern are inequities in the way WHO resources are distributed around the world. "There is definitely less money going to countries with the greatest need," says Walt.

A recent study of 12 countries by a team of public health experts including Walt—which was commissioned by Australia, Canada, Italy, Norway, Sweden, and the United Kingdom—found that some of the nations most desperately in need of help from WHO were receiving significantly less aid than others in a better position to help themselves. For example, Mozambique, which is recovering from a 16-year-long civil war that essentially destroyed its health infrastructure, was found to be receiving only about half the assistance given to Ecuador, which has a relatively well-developed health system and only one-tenth the population.

Physician Carlos Tiny, head of WHO's office in Maputo, Mozambique's capital, told *Science* that the office has a technical staff of only five people, including himself. Yet, since last August, Mozambique has been ravaged by a cholera epidemic that has racked up 7000 cases and more than 200 deaths—and this in a country that has only 400 doctors for its 15 million inhabitants. Fortunately, much of the gap is being filled by numerous other aid agencies also working in the country. "The WHO is a technical cooperation agency and not a funding agency," Tiny says. "But if we had more staff, we could be more instrumental in coordinating donor input. We will never receive all the funds we need, but there is room for improvement."

Indeed, some critics of WHO believe the organization has stretched itself too thin and should concentrate its resources on the neediest countries. "The WHO has tried to be all things to all people," says immunologist Barry Bloom of the Albert Einstein College of Medicine in New York City. "But it doesn't have the funds to control every disease in every country in the world. Most countries don't need the WHO in there to vaccinate their kids. The WHO should really focus on upgrading health care in the poorest countries, because no one else is going to do it."

Some go so far as to argue that the headquarters should move entirely out of Geneva, a city with one of the highest costs of living in the world. "The WHO should become an organization that spends far fewer resources bringing people to Geneva to discuss policy and more resources getting people to build real programs in communities in the developing world," says Joseph McCormick, a former virus hunter with the U.S. Centers for Disease Control and Prevention in Atlanta and now at the Pasteur Institute in Paris. "Perhaps moving to Abidjan or Lagos or Karachi or Calcutta might reduce the bureaucracy and increase the amount of genuine commitment."

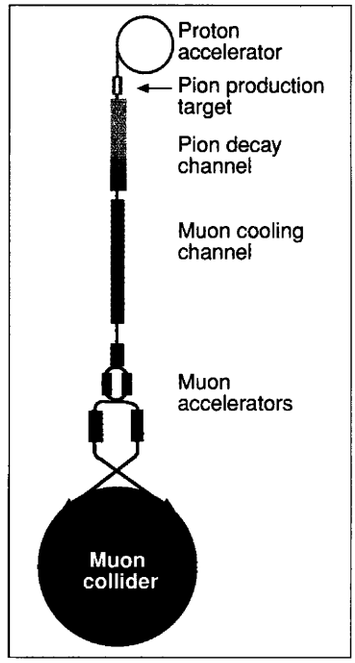
Such a dramatic step seems unlikely, at least at this juncture. But whoever is chosen as the organization's new director-general will clearly have to lead WHO in new directions if it is to retain its relevance into the next century. Says WHO's Holck: "To get us going along the right path at this crossroads, we need someone with guts and determination. And that person won't be easy to find."

–Michael Balter

HIGH-ENERGY PHYSICS

Physicists Dream of a Muon Shot

When you plan to accelerate subatomic particles to astronomical energies and collide them to spawn new forms of matter, your choice of a projectile is critical. Hadrons—protons, for instance—shatter on impact into smaller pieces such as quarks and gluons, making their collisions messy and hard to interpret. Electrons are indivisible and yield cleaner collisions, but they emit energy-wasting synchrotron radiation when they are accelerated in circular machines. At a meeting last month in San Francisco, a group of physicists considering the next great collider—a hoped-for successor to the Large Hadron Collider (LHC) now being built at CERN in Geneva—pinned their hopes on the electron's chubby brother, the muon.



SOURCE: CERN COURIER

Catching muon beams. High-energy protons (green) collide with a target to produce pions (blue), which gradually decay to produce muons (red).

Pointlike, negatively charged particles 207 times more massive than the electron, muons generally have a fleeting existence in the debris resulting from particle collisions. Partly for this reason, they have never before been used as accelerator projectiles. But they and their positively charged antiparticles have some compelling advantages, promising the clean collisions of electrons without their wasteful synchrotron radiation. Although some researchers favor a hadron or electron collider as a successor to the LHC, the group that met at the 4th International Conference on Muon Colliders "is becoming more and more enthusiastic about muon colliders," says Andrew Sessler of Brookhaven National Laboratory (BNL) in Upton, New York.

Indeed, Sessler and his colleagues are now proposing a large-scale test of muon collider technology to see if they can generate and marshal these ephemeral particles into a coherent beam. "This is becoming more and more a real thing," he says. "And we expect that we can do it for less money."

The $5 billion LHC, which will begin colliding protons and antiprotons at an energy of 14 trillion electron volts (14 TeV) in 2005, may well offer a glimpse of the Higgs boson, a hypothetical particle that would help explain the varied masses of other particles. The machine may also reveal supersymmetric particles, heavier partners to known particles, which are predicted by a theory called supersymmetry. But to follow up on these clues, researchers will need a new machine that can produce Higgs and supersymmetric particles en masse and precisely measure their properties.

Proton-antiproton collisions are ill suited to making these precision measurements, says Howie Baer of Florida State University in Tallahassee: "You get lots of extra quarks and gluons, making the events very 'messy.'" And because electrons give off copious synchrotron radiation when a magnet bends their paths, a next-generation electron collider would probably