

# 2009 ANNUAL REPORT

Working Across the Globe to End Needless Suffering



“A scientist who is also a human being cannot rest while knowledge which might reduce suffering rests on the shelf.”

Albert B. Sabin, MD

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## Letter from the Chairman and CEO

Dear Sabin Supporters,

We are pleased to present the Sabin Vaccine Institute's 2009 Annual Report "Working Across the Globe to End Needless Suffering." In the spirit of science in pursuit of humanitarian goals, Sabin has been engaged in almost a dozen major projects with an emphasis on controlling and eliminating infectious and neglected tropical diseases (NTDs).

With funding from the Bill & Melinda Gates Foundation, the Global Network for Neglected Tropical Diseases continues to raise awareness and resources to increase access to existing medicines that can control and over time, eliminate the seven most common NTDs for approximately 50 cents per person, per year. These diseases of antiquity, referenced in the Bible and other ancient texts, are no longer health threats in the developed world, but continue to wreak havoc on the poorest and most marginalized communities, the world's "bottom billion."

Our unwavering commitment to developing low-cost vaccines for infections and diseases that devastate these impoverished communities around the globe continues. Sabin Vaccine Development continued research and development, with The George Washington University and other partners, of the first-ever recombinant vaccines to combat hookworm and schistosomiasis. Our scientists have recently partnered with PATH Malaria Vaccine Initiative and others to develop a transmission blocking malaria vaccine.


Identifying innovative financing solutions for immunizations and promoting awareness and utilization of vaccines against killer infectious diseases remains the core objective of our Vaccine Advocacy and Education initiatives. The Pneumococcal Awareness Council of Experts (PACE) led several events around the world, using World Pneumonia Day to call attention to the world's leading killer of children. Our Sustainable Immunization Financing (SIF) program brought together ministers of health and finance and parliamentarians in 15 countries to encourage policymakers to increase funding of national immunization programs.

We hope that you will be encouraged by the tremendous opportunities to contribute to poverty alleviation through the innovative and scientifically supported approaches of Sabin. We express our deep appreciation to those who have generously supported our work. There is much to be done, but with your support we believe that attainment of our vision will not be far away.

Sincerely,

  
Morton P. Hyman  
Chairman



  
Michael W. Marine  
Chief Executive Officer



## Message from the President

Dear Friends,

This has been a transformative year for Sabin. The addition of new leadership and staff has enabled us to expand our reach in areas core to our mission, while the growth of our programs reflects remarkable progress in realizing our vision of making a tangible difference in the lives of hundreds of millions of people suffering from infectious and neglected tropical diseases (NTDs). We are at a watershed moment of increasing innovation, research, and awareness.

The control and eventual elimination of these diseases demand solutions that are nimble, strategies that can be adapted to different cultures and countries, and leadership that embraces collaboration with partners of all types, each a component of the Sabin model. We have played a major role in making NTDs a global health priority and we continue our work to increase access and affordability of treatments and vaccines, while strengthening our established product development partnerships to develop vaccines that are desperately needed, but don't yet exist.


In the coming year, clinical trials will be initiated for the human hookworm infection antigen *Na-GST-1*, a key advance for the Sabin Vaccine Development team. Also, the schistosomiasis antigen *Sm-TSP-2* will be manufactured by our partner, Instituto Butantan in Brazil. Vital to both vaccines are partnerships with Brazil's Fundação Oswaldo Cruz and the Brazilian Health Ministry.

Through the Global Network for Neglected Tropical Diseases, we have the opportunity to control or eliminate several of the seven most common NTDs and to lift "the bottom billion" out of extreme poverty. The short-term solution to defeating NTDs rests in increased funding, which would result in improved school attendance, worker productivity and better maternal and child health.

Our Vaccine Advocacy and Education team will continue its work with policymakers and global health stakeholders to increase the use of vaccines that already exist for deadly illnesses such as HPV, pertussis, rotavirus, and pneumococcal disease. South Africa will be the site of two important forums in 2010. In August, the 9th Rotavirus Symposium will bring together stakeholders from over 20 countries. In the fall of 2010, our Sustainable Immunization Financing program will bring together representatives from 15 countries for a forum on immunization financing.

The need is great; our collective capacity is greater. Sabin will continue its commitment to eliminating and controlling infectious and neglected tropical diseases. I look forward to your ongoing support and engagement with the Institute as we strive to reach our mission.

Sincerely,

  
Peter J. Hotez, MD, PhD  
President



## About Us

We're scientists.

We're researchers.

And we're advocates for a world free of needless suffering.

The Sabin Vaccine Institute (Sabin) is a non-profit, 501(c)(3) organization dedicated to reducing needless human suffering from infectious and neglected tropical diseases through prevention and treatment. Sabin works with governments, academic institutions, scientists, medical professionals, and non-profit organizations to provide short and long-term solutions for some of the globe's toughest health care challenges.

Since its establishment in 1993, Sabin has been at the forefront of global efforts to eliminate, prevent and cure infectious and neglected tropical diseases by developing new vaccines, establishing international networks and advocating for effective and efficient delivery of preventions and treatments to the world's poor.

## The Sabin Mission

To reduce needless human suffering from infectious and neglected tropical diseases through innovative vaccine research and development; and to advocate for improved access to vaccines and essential medicines for citizens around the globe.



Sabin was founded on the legacy and global vision of one of medicine's most pre-eminent scientific figures, Dr. Albert B. Sabin, best known for developing the oral live virus polio vaccine. Dr. Sabin not only dedicated his entire professional career to groundbreaking medical advancements to reduce human suffering, he also waged a lifelong campaign against poverty and ignorance.

The Institute continues Dr. Sabin's vision by providing greater access to vaccines and essential treatments for hundreds of millions of people stuck in a cycle of pain, poverty and despair through its three main programs – Sabin Vaccine Development, the Global Network for Neglected Tropical Diseases, and Vaccine Advocacy and Education. Through these three distinct yet complementary programs, the Institute continues Dr. Sabin's lifelong efforts to develop preventive measures for diseases that place heavy burdens on the world's poorest countries.



# Sabin Vaccine Development

## Who We Are

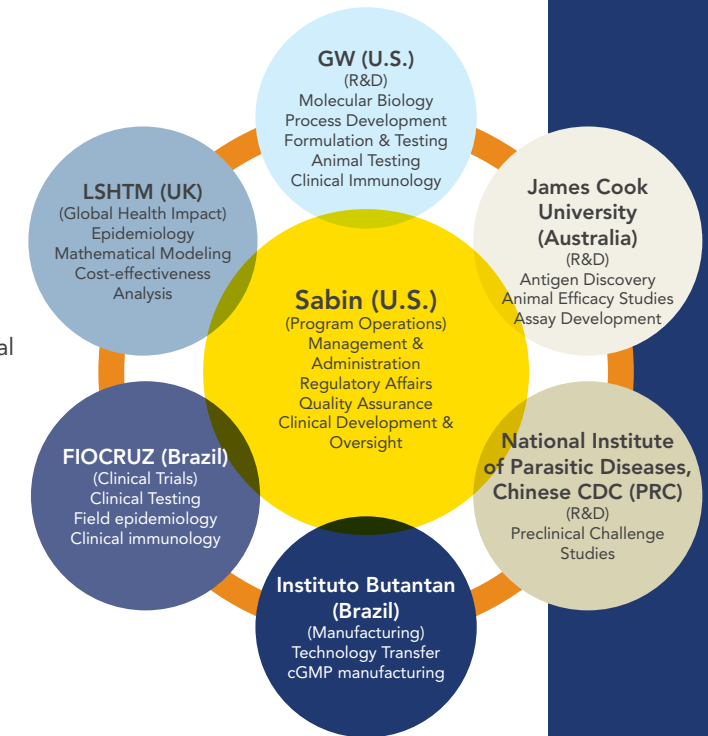
Sabin Vaccine Development is a product development partnership (PDP), headquartered at the Sabin Vaccine Institute, leveraging industry practices to produce a new generation of antipoverty vaccines. Sabin Vaccine Development has built the infrastructure and capacity for research, development, and manufacture of potential vaccine candidates. Under the leadership of Dr. Peter Hotez, the program has a strong management and administrative core experienced in vaccine development, quality assurance, regulatory affairs, and clinical trials.

Sabin Vaccine Development is an international collaboration comprised of The George Washington University (GW) in the United States, Fundação Oswaldo Cruz (FIOCRUZ) and Instituto Butantan in Brazil, James Cook University in Australia, the London School of Hygiene and Tropical Medicine (LSHTM) in the United Kingdom, and The Institute of Parasitic Diseases at the Chinese Center for Disease Control and Prevention in China.

## What We Do

With ten years of experience, we have produced a well-rounded model that serves as a blueprint for the development of safe and effective vaccines against infectious and neglected tropical diseases. Existing capabilities include:

- Product Development:** We have established the infrastructure to engage in antigen discovery, rapid development of scalable manufacturing processes (process development), quality control, preclinical and clinical immunology and stability testing.
- Technology Transfer and Manufacturing:** We work with manufacturers in both Brazil and the United States to scale up developed processes for manufacture of pilot clinical lots under current good manufacturing practices (cGMP).
- Epidemiological and Clinical Studies:** We have established a field laboratory and field clinical site, including a vaccine testing center in the endemic region of Americaninhas in the Brazilian state of Minas Gerais, for the conduct of clinical trials, including Phase 1 (first in human trials).
- Ethical and Regulatory Approvals:** We have completed Phase 1 clinical trials with ethical oversight from institutional review boards in the United States and Brazil and obtained regulatory approval for clinical testing from the U.S. Food and Drug Administration (FDA) and Brazilian regulatory agency, the Agência Nacional de Vigilância Sanitária (ANVISA).



Hookworm infection antigen manufactured for toxicological and clinical use in Brazil where **32** million of the estimated **600** million global hookworm cases occur in populations surviving on an income of less than **\$1.25** a day.



4 vaccine antigens in development for 3 parasitic diseases which afflict over 1 billion individuals primarily residing in the developing world.

### Our Programs

#### The Human Hookworm Vaccine Initiative (HHVI)

With financial support from the Bill & Melinda Gates Foundation, the HHVI was launched in 2000 as the world's first-ever vaccine program targeting human hookworm infection. *A hookworm vaccine would alleviate suffering for more than a half-billion infected people. Globally, an estimated 3.2 billion people are at risk, including hundreds of millions of children and 44 million pregnant women.* Hookworms are intestinal worms that cause blood loss in the gut, leading to iron-deficiency anemia and protein malnutrition, particularly in children and pregnant women. Chronic hookworm infection in children contributes to physical and intellectual impairment, learning difficulties and poor school performance. This often leads to an under-achieving workforce in already economically depressed communities, thereby perpetuating the cycle of poverty.

The HHVI has identified several candidate antigens for the human hookworm vaccine. Two of these promising antigens will soon be ready for clinical trials: Na-GST-1 was manufactured in the fall of 2009 and will be ready for clinical testing in late 2010, and Na-APR-1 is scheduled to be manufactured in 2011. Following independent safety testing of each antigen, the human hookworm vaccine under development will ultimately incorporate both the Na-GST-1 and Na-APR-1 antigens in a bivalent vaccine together with an adjuvant.

#### The Schistosomiasis Vaccine Initiative (SVI)

*The development of a vaccine for schistosomiasis has the potential to improve the lives of more than 200 million people in 74 countries worldwide.* Schistosomiasis, also known as bilharzia or "snail fever," is a parasitic disease carried by fresh water snails. Schistosomiasis is second only to malaria as the most deadly parasitic disease in the world, and kills approximately 280,000 people annually. The parasite can live inside human blood vessels for years, causing severe blood loss, anemia and malnutrition. Long-term schistosomiasis infections can also cause severe kidney, spleen and liver damage and can contribute to the development of bladder cancer, while in women female genital schistosomiasis leads to increased susceptibility to HIV/AIDS.

The SVI was launched in 2008 through a generous donation by Mort and Chris Hyman, and funding from the Blavatnik Charitable Foundation. The goal of the SVI is to utilize and leverage Sabin's existing programmatic and technical infrastructure in vaccine development to produce a safe and cost-effective schistosomiasis vaccine.

In collaboration with researchers at Queensland Institute of Medical Research (now at James Cook University), a promising new antigen, Sm-TSP-2 (*Schistosoma mansoni* Tetraspanin-2), has been selected for research. Evidence from studies of the human immune response to schistosomiasis in endemic areas and from preclinical animal studies suggest that vaccination with this antigen may induce protective immunity against infection by this parasite. In 2010, SVI plans to manufacture clinical product at Instituto Butantan, Sabin's manufacturing partner in Brazil.

#### The Malaria Vaccine Program (MVP)

PATH Malaria Vaccine Initiative (MVI), Sabin Vaccine Development, and The Johns Hopkins Bloomberg School of Public Health have formed an 18-month research collaboration to aid in the development of a transmission-blocking malaria vaccine antigen. MVI is funded primarily by the Bill & Melinda Gates Foundation and aims to develop malaria vaccines and ensure their availability and accessibility to people in the developing world.

With the investment from MVI, Sabin Vaccine Development will utilize its existing product development capabilities at The George Washington University to optimize the expression of *Anopheles* alanyl aminopeptidase-1 (AnAPN-1) in either yeast or a bacterial vector. Once the expression system is determined, researchers at GW will develop a manufacturing process to produce the AnAPN-1 antigen, as well as the release and stability tests necessary to test its identity, purity, potency and stability. The successful development of AnAPN-1 will potentially yield an important tool to aid in the control and eradication of malaria.

"The Ministry recognizes the decade-long commitment by Sabin and the Human Hookworm Vaccine Initiative (HHVI) to foster development in Brazil, in collaboration with FIOCRUZ and Instituto Butantan. We also acknowledge your efforts to build capacity with these institutions in regards to vaccine product development and clinical testing."

- Dr. Reinaldo  
Guimarães, Brazilian  
Ministry of Health



A scientist from FIOCRUZ looks into a microscope at Sabin Vaccine Development's clinical trial site in Minas Gerais, Brazil.

# Sabin Vaccine Development

## Human Hookworm Vaccine Initiative Receives A Commitment from Brazilian Government in Support of Clinical Trials

In July 2009, the Brazilian government notified Sabin of a financial commitment for translational research on neglected tropical diseases (NTDs) that will support the HHVI's vaccine development program in Brazil. This pledge is part of a broad new initiative launched by the federal government called the Programa de Aceleração do Crescimento (Program for Accelerated Growth), and seeks to facilitate the translation of basic science discoveries for NTDs that are important in Brazil into new vaccines, drugs and diagnostics. It also recognizes the decade of collaboration between the HHVI and Brazilian organizations such as FIOCRUZ and Instituto Butantan, and Sabin's commitment to fostering vaccine development and clinical testing in Brazil.

The funds will be used to invest in infrastructure and capacity building for hookworm and schistosomiasis vaccine development at the clinical laboratories of Centro de Pesquisas René Rachou (CPqRR/ Fiocruz Belo Horizonte) and the clinical trial field site in Minas Gerais, both of which are operated as a collaboration between the HHVI and FIOCRUZ.



Paula A. Freitas pipettes at the labs of FIOCRUZ.

## Manufacture of Human Hookworm Vaccine at AERAS Completed

In the fall of 2009, Sabin Vaccine Development partnered with the AERAS Global TB Vaccine Foundation to manufacture the Na-GST-1 Hookworm Vaccine at its Rockville, MD production facility. AERAS is a non-profit product development partnership (PDP) funded primarily by the Bill & Melinda Gates Foundation. This state-of-the-art GMP-compliant facility has the capacity to produce up to 200 million doses of recombinant Bacillus Calmette-Guérin (BCG) tuberculosis vaccine per year, and is geared toward vaccine production and distribution at the lowest possible cost. Both of these factors make AERAS an ideal partner in the production of NTD vaccines, and one lot of Na-GST-1 Hookworm Vaccine has been produced for toxicological and clinical use.

The successful manufacture of the Na-GST-1 Hookworm Vaccine is an important step towards the eventual creation of a bivalent vaccine candidate for hookworm. Immunization with Na-GST-1 Hookworm Vaccine may interfere with the ability of adult hookworms to digest hemoglobin, therefore inhibiting their ability to feed and produce eggs. This may result in



Dr. Ricardo Fujiwara of FIOCRUZ completes the first step of subject blood sample preparation.

a less severe infection and a reduction in the chronic adverse health effects of this parasite. Clinical trials for this promising candidate are scheduled to begin in Brazil in late 2010.

# Vaccine Advocacy and Education

## Who We Are

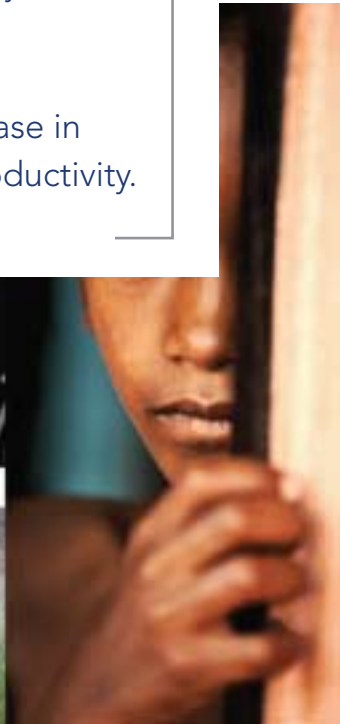
The Vaccine Advocacy and Education team is motivated by the number of lives that can be saved and the extraordinary personal and community benefits gained through widespread immunization. We recognize that immunization is one of the best investments a country can make for the health and vitality of its population as well as the growth of its economy. Inspired by Albert B. Sabin’s desire to get vaccines off the shelves and into children’s arms, the Vaccine Advocacy and Education program was launched in 2003 to ensure that decision-makers have the information and resources they need to introduce and sustainably fund safe and effective vaccines. Simply, our goal is to help get life-saving vaccines directly to people who are most in need.

We strive to build on our success and experience in reducing death and suffering from vaccine-preventable diseases by:

- Ensuring that all countries introduce safe and effective vaccines;
- Decreasing the time from vaccine development to introduction in poor and middle income countries;
- Increasing government ownership and financial sustainability of national immunization programs; and,
- Conducting original research to underscore the need to introduce vaccines.

Vaccines do not only prevent death, they also increase scholastic achievement and worker productivity by reducing illness and chronic disability.

71% of costs associated with pneumococcal disease in Latin America are due to long-term lost labor productivity.



## What We Do

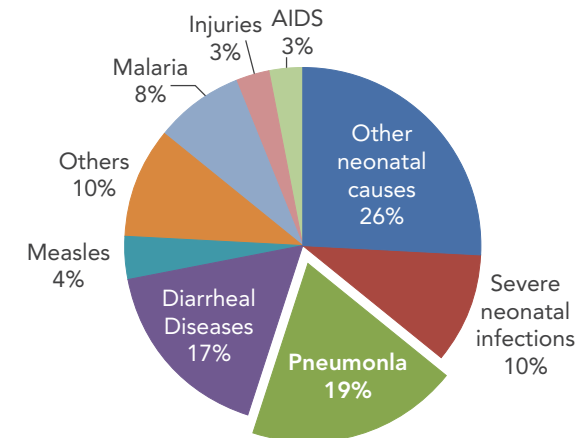
### PACE: Raising Awareness and Action

The Pneumococcal Awareness Council of Experts (PACE) is a project of the Sabin Vaccine Institute focused on pneumococcal disease awareness and prevention. Pneumococcal disease takes the lives of 1.6 million people each year—including more than 800,000 children under age five—making it a leading infectious killer worldwide. PACE works through a variety of mediums to drive forward pneumococcal awareness and advocacy efforts, including media outreach, original research, panel and roundtable discussions, and its Global Call to Action.

Since its inception, PACE’s media outreach efforts have reached an audience of more than 150 million in over 25 countries through 579 print, radio, and TV outlets worldwide. *These efforts have helped motivate countries like Turkey and Rwanda to introduce life-saving pneumococcal conjugate vaccine.*

PACE played a critical role in organizing and launching the first-ever World Pneumonia Day on November 2, 2009. The creativity, energy, and impact PACE brought to the cause were demonstrated by two days of events in Dhaka, Bangladesh including a press conference, televised roundtable discussion, march and rally, and a national symposium, which drew major national and international figures including members of parliament from the United Kingdom and Bangladesh. *PACE’s leadership established November 2nd as World Pneumonia Day and helped pave the way for countries such as Bangladesh to introduce pneumococcal conjugate vaccine into their national immunization program.*

### Leading causes of death in children under 5 years old



Students and health professionals rally on World Pneumonia Day to raise awareness of the disease in Dhaka, Bangladesh. The two days of activities in Bangladesh, organized and sponsored by PACE, drew media attention from every major national news outlet.

5 Sabin Senior Program Officers sponsored multiple parliamentary briefings on immunization financing in 8 countries and attended more than 150 meetings with ministry of health and finance officials and representatives of the GAVI Alliance, WHO, UNICEF and the World Bank.

**Sustainable Immunization Financing Program: Promoting Sustainability**  
 In the developing world, high price tags on new vaccines keep them from reaching the children who need them the most. Recognizing this problem, large donors, including the GAVI Alliance, the World Health Organization, and UNICEF have increased their financial support to help developing and emerging-market countries purchase vaccines. Countries are also beginning to increase their share of the investment, yet questions remain about the long-term sustainability of immunization financing.

With funding provided by the Bill & Melinda Gates Foundation, Sabin's Sustainable Immunization Financing (SIF) program was established in 2007 to help countries increase their share and amount of government funding for immunization to meet rising immunization costs and attain sustainability. *The program takes a unique approach: rather than provide material support to national immunization programs, the SIF program helps Ministries of Health, Ministries of Finance, and legislators to identify long-term funding solutions for national immunization programs.* The first step is to establish a dialogue

among the key national counterparts. The SIF program helps country officials document the economic efficiency and cost-effectiveness of each country's immunization program. With an investment case to inform budgetary decisions, governments are better positioned to justify increases in their immunization program budgets, thereby reducing donor dependency. The SIF program also engages other domestic partners, such as civil society organizations and private businesses, in the national immunization program. The involvement of these other stakeholders solidifies national ownership, promotes inter-sectoral collaboration and induces greater government accountability, further strengthening public support for the programs.

*By focusing attention on the need to secure sufficient funding for the health sector, and in particular the national immunization program, the SIF program is empowering nations to take critical steps towards fiscal sustainability.* After a briefing in Kinshasa, Democratic Republic of Congo in 2009, the Minister of Budget issued an order for the release of funds to the GAVI Alliance. Parliamentarians in the DR Congo are also now exploring the possibility of establishing a committee devoted to immunization financing.



Senior Program Officer Jonas Mbwangue presents immunization financing concepts to parliamentarians in Mali.

**Conducting Original Research: Uncovering the Burden of Disease**

**Pneumococcal Disease Burden Study**  
 Sabin conducted the first-ever study to estimate the comprehensive burden of pneumococcal disease in the Latin America and Caribbean region as well as the cost effectiveness of pneumococcal vaccination. The landmark report found that more than 18,000 people die every year in the region from preventable pneumococcal-related diseases. The report also revealed that the region was spending more than \$294 million in direct medical costs to treat these diseases, not including the countless millions in associated costs due to lost wages and opportunity costs. Using these findings, countries are now able to formulate evidence-based plans highlighting the need for urgent action to introduce vaccines in the region.



PACE Co-Chairs Drs. Ciro de Quadros (left) and Orin Levine (right) present WHO pneumonia expert Dr. Thomas Cherian (center) with the 2009 Global Leadership Award for his pivotal work to accelerate access to vaccines preventing pneumococcal disease.

Current WHO-recommended vaccines are preventing up to 25% of child mortality in developing countries. Newly-developed vaccines against hepatitis B, *Haemophilus influenzae* type b, pneumococcal disease, rotavirus, and Human Papillomavirus have the potential to prevent another 10-15%—but they will also more than double the cost of childhood immunization. SIF is working with 15 countries to help reduce costs by identifying additional external and domestic financing resources to ensure these newer vaccines come into routine use.

The 2009 Global Leadership Award was presented to Dr. Thomas Cherian in 2010 for his pivotal work to accelerate access to vaccines preventing pneumococcal disease. In 2007 and 2008, PACE awarded its annual Global Leadership Award to the Ministries of Health of Costa Rica and Rwanda, respectively, for being role models in their regions and introducing pneumococcal conjugate vaccine.

*Symposium Sparks Action on Rotavirus*

In 2004, Sabin held its first Rotavirus Symposium in Mexico City with more than 400 people from over 30 countries in attendance. Soon after, regional momentum for a rotavirus vaccine began to build. In 2006, Nicaragua introduced rotavirus vaccine into its immunization schedule, becoming the first developing country to introduce a vaccine during the same year that it was licensed. Today, rotavirus vaccine is available in more than 20 countries.

**HPV Disease Burden Study**

In 2007, Sabin released a study showing for the first time that 33,000 women die every year in the Latin American and Caribbean region from cervical cancer, a preventable disease caused by the human papillomavirus (HPV). In conjunction with partners from the Pan American Health Organization and the Centers for Disease Control and Prevention, our multi-national research team reviewed more than 15 years of research, publishing the first major assessment of the impact that HPV has had on the region. The study showed that the virus is far more common than anyone expected and effectively demonstrated that routine screening, along with vaccination, is the only way to tackle this disease. Less than two months after the study was released, the GAVI Alliance announced that the HPV vaccine is among its next priorities. *New cost-saving approaches to cervical cancer screening, with the potential to greatly improve detection and treatment in low resource settings, are currently being implemented in Latin America and the Caribbean.*

Our work enables decision-makers to view immunization not as an expenditure, but as a cost-effective investment in the lives of their citizens.

**Africa Review Papers**

The Africa Review Papers are a set of comprehensive literature reviews produced by PACE that draw widespread attention to the problem of pneumococcal disease. Among the findings were that African children suffer an alarmingly high burden of sequelae from pneumococcal meningitis and that people with sickle cell disease, which is most common in Africa, are especially vulnerable to invasive bacterial infections like meningitis. The conclusions from the papers make a strong case for African countries to act urgently to prevent pneumococcal disease and are being used to support current advocacy efforts in the region.

**Meetings and Symposia**

To help spark the momentum necessary to get countries to introduce life-saving vaccines, we reach out to policymakers, researchers, physicians, and other stakeholders through scientific symposia. Sabin has convened nearly a dozen meetings in the last two years, bringing together more than 1,500 people from over 50 countries to discuss and plan the introduction of new vaccines in their countries. These doctors, scientists, government officials and other stakeholders all share a common interest in the worldwide reduction of needless suffering and preventable deaths. Attendees interact with industry leaders, creating a unique dialogue that facilitates a two-way transfer of knowledge.



Thus far, **117** professional societies and organizations from **50** countries have endorsed PACE's Global Call to Action, with **28** countries introducing pneumococcal vaccine since PACE's inception in 2006, to prevent pneumococcal disease, which kills over **800,000** children under **5** worldwide each year.

# Global Network for Neglected Tropical Diseases

## Who We Are

The Global Network for Neglected Tropical Diseases, a major initiative of the Sabin Vaccine Institute, is an advocacy and resource mobilization program dedicated to helping control and eliminate the seven most common neglected tropical diseases (NTDs)—a group of disabling, disfiguring and deadly diseases affecting more than 1.4 billion people worldwide living on less than \$1.25 a day.

Our goal is to provide an advocacy platform for the NTD community that reaches the attention of policymakers, philanthropists, thought leaders and the general public. The Global Network mobilizes resources, raises awareness and seeks to expand efforts to deliver cost effective and proven successful NTD treatments to the “bottom billion.”

For approximately **50 cents** per person, per year, we can treat the seven most common NTDs, representing 90% of the global NTD burden—making an investment in NTD control a “best buy” in global health.

“We will fight neglected tropical disease. And we won’t confront illnesses in isolation — we will invest in public health systems that promote wellness and focus on the health of mothers and children.”

- Barack Obama, United States President



## What Are Neglected Tropical Diseases?

NTDs are parasitic and bacterial infections that are widespread among people in poor, rural and peri-urban communities. They are the most common infections of the “bottom billion,” and result in a global disease burden equivalent to HIV/AIDS or malaria.

Research has shown that significantly reducing the burden of NTDs could lift millions out of poverty by:

- **Ensuring children stay in school to learn and prosper.** NTDs infect over 600 million school-aged children throughout the developing world. Treating their infections is the single most cost-effective way to boost school attendance.
- **Strengthening worker productivity.** Global NTD control can contribute hundreds of billions of dollars to developing economies through increased worker productivity.
- **Improving maternal and child health.** Treating NTDs greatly reduces adverse pregnancy outcomes and cuts the prevalence of anemia and malnutrition, which cause 35% of the global disease burden, in children under five.

## What We Do

The Global Network raises the profile of NTDs and builds support for control and elimination activities through our efforts to educate, advocate, catalyze, and convene. We highlight efforts underway in the field, and we connect global players and afflicted communities to increase access to vital medicines that can control and eliminate NTDs and lift the world’s poorest people out of poverty. We work through three primary tracks:

- **Policy and Advocacy:** We raise the profile of NTDs among policymakers, thought leaders, and the general public to foster the collective will to take action and support the control and elimination of these diseases.



Supported NTD treatment campaigns in **5** countries impacting more than **16** million individuals who were treated for **3** of the **7** most common NTDs.

Melinda Gates, sitting next to husband Bill Gates, holds a copy of “The Campaign to ‘End the Neglect 2020’” at the 2009 World Economic Forum in Davos, Switzerland.

## End the Neglect 2020

In January 2009, at the World Economic Forum in Davos, Switzerland, the Global Network kicked off its new global campaign, “End the Neglect 2020,” launched with a catalytic \$34 million grant from the Bill & Melinda Gates Foundation. The campaign’s goal is to raise awareness and support from governments, corporations, foundations and individuals to control and eliminate some of the most devastating and deadly NTDs by 2020.

- **Resource Mobilization:** We engage the donor community to increase and sustain investments in NTD control and elimination efforts. We believe every donor can make a difference in ending the neglect and we connect donors with afflicted communities and facilitate high-impact and highly leveraged investments.
- **Global Coordination:** We help coordinate the NTD community around a global campaign to control and eliminate the most common diseases of poverty. Through a grant from the Bill & Melinda Gates Foundation, we are helping to shape regional strategies and financing mechanisms to raise and efficiently disburse resources to affected communities.

### Just 50 Cents

Just 50 Cents is the Global Network’s signature grassroots fundraising and awareness campaign, designed to give individuals the chance to turn nickels, dimes, and quarters into meaningful change. Goals of the grassroots initiative include:

- Building broad-based public awareness of NTDs;
- Raising funds from grassroots supporter base;
- Developing an international constituency that can be mobilized for policy and advocacy purposes; and,
- Building partnerships across sectors.

Collection drives in schools, workplaces, and communities raise awareness and money to increase access to integrated NTD control for those burdened with NTDs around the world. Rotary clubs, high school, and university students in the U.S. and abroad have successfully run Just 50 Cents campaigns.

Just 50 Cents would not be possible without the generous drug donation programs of pharmaceutical companies including GlaxoSmithKline; Merck & Co., Inc.; Pfizer; Johnson & Johnson; Merck KGaA; and MedPharm. The Global Network expresses its deep gratitude for their commitment.

### Campus Challenge Pilot Launch

The Global Network is working to harness an unprecedented surge of student interest in global health by providing students with the opportunity to act and be involved in a new global health constituency. Therefore, a major component of the Just 50 Cents Campaign is university engagement through the Campus Challenge, a contest which provides an opportunity for college students to become Student Ambassadors in the fight to prevent and eliminate NTDs.



Campus Challenge participants from the University of Illinois at Chicago College of Medicine.

### Global Network Ambassadors

The Global Network’s Ambassador Program continued to grow this year. Our first ambassador, actress Alyssa Milano, donated \$100,000 to allow the African Programme for Onchocerciasis Control (APOC) to purchase up to 1,000 bicycles for community drug distributors in Tanzania and Liberia. She also issued a challenge grant to the Campus Challenge participants. Former Secretary of the U.S. Department of Health and Human Services and four-term Governor of Wisconsin Tommy Thompson, also continued in his role as a Global Network Ambassador. This year he travelled, along with former U.S. Ambassador to Tanzania and current Malaria No More Policy Center Director Mark Green, to Tanzania where he reinforced the Global Network’s commitment to integrating NTD and malaria treatment efforts. Thompson also participated in two think tank/academic briefings facilitated by the Global Network, and continues to lend his voice to educate policymakers on our behalf.



Alyssa Milano  
Global Network Ambassador



Tommy Thompson  
Global Network Ambassador

Advocated for the inclusion of **7** neglected tropical diseases into the Congressional Malaria Caucus, renamed the Congressional Malaria and NTD Caucus, with **60** members of Congress representing **21** states and **1** US territory.

## Global Network - A Year of Momentum

Whereas 2008 was the tipping point for positive action on NTDs, 2009 was a year of growing momentum.

In 2009, the Global Network succeeded in:

- Establishing exciting new partnerships with influential organizations including the Brazilian National Soccer team and the Miss Universe Organization;
- Developing our grassroots campaign, Just 50 Cents, and mobilizing more than a dozen universities ahead of the November 2009 launch of the Campus Challenge;
- Expanding the U.S. Congressional Malaria Caucus to include NTDs and educating members of Congress on the importance of fighting NTDs, leading to increased Congressional funding;
- Forming the first regional hub, in collaboration with the Inter-American Development Bank and the Pan American Health Organization, for Latin America and the Caribbean;
- Engaging new partners and donors to build a foundation for Asian, African, and potentially Eastern Mediterranean regional hubs; and,
- Raising public awareness on NTDs through the media and public service announcements.

## Global Network Highlights

### Regional Efforts in Latin American and the Caribbean

A catalytic partnership between the Global Network, the Inter-American Development Bank, and the Pan American Health Organization is working to scale up prevention and treatment efforts in the Americas to significantly reduce the burden of neglected diseases in the region. In close collaboration, these organizations have launched a trust fund to support the delivery of an estimated 200 million treatments through cooperation between the public and private sectors, governments, and participating communities.

This partnership's cross-sectoral approach also incorporates investments in water, sanitation, and housing that will improve overall public health, increase school attendance, and decrease poverty, thus enhancing the effects of NTD control.

### Deworming Efforts in Cameroon

The Global Network collaborated in the successful 2009 nationwide deworming campaign in Cameroon. Working with the Cameroon Ministries of Health and Education, the Union of United Councils and Cities of Cameroon, WHO, UNICEF, Johnson & Johnson, and Merck, the campaign targeted all 10 regions of Cameroon and a total of 4,000,000 school-age children in 13,000 schools. In each district, directors of schools and health personnel were trained, and health education and deworming materials were distributed.

Another breakthrough in the campaign is the creation of a tripartite partnership agreement between the Ministry of Health, the Ministry of Basic Education, and the Union of United Councils and Cities of Cameroon. This innovative partnership will boost the control of schistosomiasis and intestinal helminths in Cameroon as its members work together to carry out regular deworming of Cameroonian children in schools over the next three years.



Former U.S. President Bill Clinton and Sabin President Dr. Peter Hotez at the Clinton Global Initiative Annual Meeting.

## The Writings of Sabin Scholars

Sabin scholars are the authors of peer-reviewed science-based pieces that add to the global base of knowledge about vaccine development, international advocacy and neglected tropical diseases. In 2009, Sabin Scholars authored numerous papers for such prestigious journals as *The Lancet*, *Vaccine*, *Health Affairs*, *Public Library of Science (PLoS)*, and the *American Journal of Law & Medicine*.

Several of these papers received excellent media attention including “Empowering Women and Improving Female Reproductive Health through Control of Neglected Tropical Diseases” and “The Neglected Tropical Diseases and Their Devastating Health and Economic Impact on the Member Nations of the Organisation of the Islamic Conference” both written by Dr. Peter Hotez and featured in the *New York Times*.

Additional examples showcasing the breadth of research carried out by Sabin Scholars in 2009 include:

- **Ciro de Quadros.** “From global to regional: the importance of pneumococcal disease in Latin America” in *Vaccine*.
- **Ciro de Quadros and M. Teresa Valenzuela.** “Antibiotic resistance in Latin America: a cause for alarm” in *Vaccine*.
- **Ciro de Quadros and Orin Levine.** “Pneumonia prevention gets a fresh opportunity.” in *International Journal of Tuberculosis and Lung Disease*.
- **Jon K. Andrus;** **Ciro de Quadros;** **Cuauhtémoc Ruiz Matus;** **Luciani Silvana;** **Peter Hotez.** “New vaccines for developing countries: will it be feast or famine?” in the *American Journal of Law and Medicine*.
- **Jeff Bethony,** **Maria Elena Bottazzi,** **Ami Shah Brown,** **David Diemert,** **Alex Loukas,** **Peter Hotez.** “Hookworm vaccines.” in *New Generation Vaccines, Fourth Edition*.
- **Maria Elena Bottazzi and Ami Shah Brown.** “Model for product development of vaccines against neglected tropical diseases: a vaccine against human hookworm.” in *Expert Review of Vaccines*.
- **Meenakshi Ramakrishnan,** **Aaron Ulland,** **Laura Steinhardt,** **Jennifer Moisi,** **Fred Were,** **Orin Levine.** “Sequelae due to bacterial meningitis among African children: a systematic literature review.” in *BMC Medicine*.
- **Peter Hotez and Ami Shah Brown.** “Neglected tropical disease vaccines” in *Biologicals*.
- **Peter Hotez,** **Alan Fenwick,** **Lorenzo Savioli,** **David H. Molyneux.** “Rescuing the bottom billion through control of neglected tropical diseases.” in *The Lancet*.
- **Philip Musgrove and Peter Hotez.** “Turning neglected tropical diseases into forgotten maladies.” in *Health Affairs*.

## Sabin Scholars Honored

### Sabin President Dr. Peter Hotez Elected Member of the Institute of Medicine

Dr. Peter Hotez was elected a member of the Institute of Medicine (IOM) at the Institute’s 38th annual meeting in late 2008. Election into the IOM is one of the highest honors in the fields of health and medicine as it recognizes exceptional professional achievement and commitment to service. Dr. Hotez’s selection to the IOM symbolizes the value of his contributions to international medicine, especially in the fight against infectious and neglected tropical diseases.



### Dr. Ciro de Quadros honored by Brazilian Ministry of Health

In November 2009, Sabin Executive Vice-President Dr. Ciro de Quadros travelled to Brasilia, Brazil to receive The Medal of Merit Oswaldo Cruz from the Brazilian Ministry of Health. The Medal of Merit Oswaldo Cruz was created by decree in 1970 to honor members of the Brazilian and foreign medical and public health communities who have contributed to the physical well-being and mental health of the citizens of Brazil.

### Sabin’s Founding President Receives Distinguished Alumni Award

The Sabin Vaccine Institute’s Founding President, Major General Philip Russell, MD, received the 2009 Distinguished Alumni Award from the University of Rochester School of Medicine and Dentistry in October 2009.

The annual award honors one alumnus who demonstrates a legacy of outstanding and widely recognized achievement in the field of medicine with particular emphasis on achievements that create a significant impact on a national or global scale.



### Sabin Gold Medal Award

#### Dr. Rino Rappuoli Awarded 2009 Albert B. Sabin Gold Medal Award

On April 28th, 2009 Rino Rappuoli, PhD was presented with the 2009 Albert B. Sabin Gold Medal Award. This prestigious award recognizes a distinguished member of the research community who has made extraordinary contributions in the field of vaccinology or a complementary field.

Dr. Rappuoli’s accomplishments are numerous, but what may be his most enduring and historic legacy is his use of “reverse vaccinology,” or in silico vaccinology. His work has led to a protein-based vaccine against group B meningococci. More importantly, his efforts represent a paradigm shift that could lead to new vaccines for several devastating diseases.

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Sustainable Immunization Financing

# Financial Report

## Condensed Statement of Activities

December 31, 2009 and 2008

	2009	2008
<b>Revenue and Support</b>		
Grants, contributions and other support received	\$17,128,901	\$25,550,132
Future portion of grants as of 12/31/09	\$38,309,326	N/A
Investment income	\$94,650	\$200,652
<b>Total revenue and support</b>	<b>\$55,532,877</b>	<b>\$25,750,784</b>
<b>Expenses</b>		
Program services	\$18,441,527	\$13,884,765
General, administrative and fundraising	\$1,731,244	\$777,111
<b>Total expenses</b>	<b>\$20,172,771</b>	<b>\$14,661,876</b>
Excess of revenues, commitments and support over expense	\$35,360,106	\$11,088,908

Since 2000, our vision of a world free of needless suffering has gained tremendous momentum. In that time, Sabin supporters have generously committed over 140 million dollars toward these efforts.

Sabin's Board of Trustees and executive leadership are fully committed to responsible and effective stewardship of donor funding. This commitment was recently recognized when Sabin received Charity Navigator's highest rating possible for consistently executing our mission in a fiscally responsible way, and outperforming most other charities.



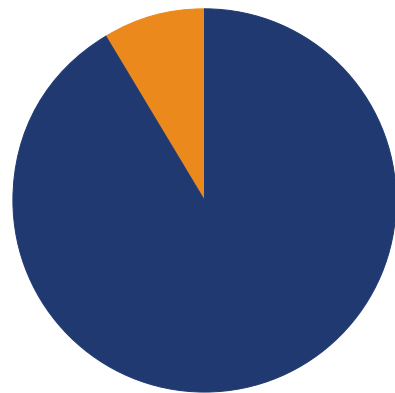
## Condensed Statement of Financial Position (audited)

December 31, 2009 and 2008

	2009	2008
<b>Assets</b>		
Cash, equivalents and other current assets	\$6,488,582	\$15,953,000
Investments	\$16,009,324	\$7,956,887
Other assets	\$54,728	\$37,750
<b>Total assets</b>	<b>\$22,552,634</b>	<b>\$23,947,637</b>
<b>Liabilities and Net Assets</b>		
Accounts payable and accrued expenses	\$2,889,732	\$1,476,342
Other liabilities	\$664,556	\$523,729
<b>Total liabilities</b>	<b>\$3,554,288</b>	<b>\$2,000,071</b>
Unrestricted net assets	\$2,321,029	\$1,550,036
Temporarily restricted net assets	\$16,677,317	\$20,397,530
<b>Total net assets</b>	<b>\$18,998,346</b>	<b>\$21,947,566</b>
<b>Total liabilities and net assets</b>	<b>\$22,552,634</b>	<b>\$23,947,637</b>

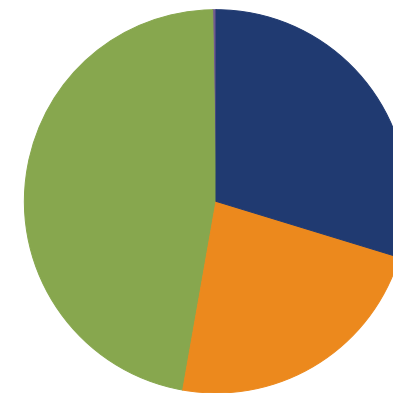
The financial statements presented here have been summarized from Sabin's audited financial statements. Sabin's full audit report, completed by Rogers & Co, LLP, is available at [www.sabin.org](http://www.sabin.org).

### 2009 functional expense allocation:



- Program services, 91.4%
- General, administrative and fundraising, 8.6%

### 2009 program expense allocation:



- Sabin Vaccine Development, 30%
- Vaccine Advocacy and Education, 23%
- Global Network, 47%
- Other programs, <1%

## A Summary of the Diseases We Fight

### Human Papillomavirus (HPV)

*Approximately 440 million infected.* HPV refers to a group of over 100 related viruses, generally symptom-free, that infect the genital area of men and women and cause genital cancers. Each year over half a million women are diagnosed with cervical cancer and another quarter million die from the disease, making it the second leading cause of cancer death in women. A disproportionate 80% of cervical cancer deaths are in developing countries.

### Malaria

*Approximately 250 million infected.* Malaria is caused by parasites transmitted to humans by infected mosquitoes. Symptoms include fever, headache, chills and vomiting. If not treated promptly, the illness can be fatal. Nearly one million people, many of them children under the age of five, die of malaria each year. Individuals residing in sub-Saharan Africa are most vulnerable to contracting the disease.

### Pertussis

Also known as whooping cough, pertussis is an upper respiratory infection caused by the *Bordetella pertussis* bacteria that lives in the mouth, nose, and throat. Symptoms include severe coughing, fever, nasal congestion, and fatigue. In 2000, the disease caused an estimated 39 million cases and 297,000 deaths worldwide.

### Pneumococcal disease

Pneumococcal disease refers to the spectrum of infections and illness caused by the bacteria *Streptococcus pneumoniae*, also known as pneumococcus, including pneumonia, meningitis,

bacteremia, and other life-threatening ailments. The bacteria are usually spread person-to-person by the respiratory route, though the bacteria can migrate through the bloodstream and cause an infection elsewhere in the body. An estimated 1.6 million people die annually from the disease worldwide including up to one million children under age five.

### Rotavirus

*Over 120 million reported cases.* Infection is transmitted via contaminated hands, water, food, or soil and is the single leading cause of diarrhea among infants and young children in the world. Complications from rotavirus, such as dehydration, can be deadly if care is not promptly and correctly administered. Over half a million children die from rotavirus every year. Another two million children are severely sickened and hospitalized by the disease.

### Rubella

*Approximately 200,000 reported cases.* Also known as German measles, infection is caused by a virus that is transmitted person-to-person via the respiratory tract. Symptoms include a low-grade fever and diffuse rash. Infection can cause severe birth defects, known as congenital rubella syndrome (CRS), if contracted by a woman early in her pregnancy. CRS can cause

hearing loss, congenital heart defects, cognitive, neurological, motor and vision problems, and liver or spleen damage.



## The Seven Most Common NTDs

### Hookworm infection

*Approximately 600 million infected.* Hookworms are soil-transmitted parasitic worms that cause intestinal blood loss leading to severe iron deficiency anemia. Children and women are considered the most vulnerable populations because they have the lowest underlying iron reserves. Chronic hookworm in childhood results in impaired physical development, fitness, cognition, and intelligence. In pregnancy hookworm increases maternal morbidity and mortality.

### Ascariasis and Trichuriasis

*Over one billion infected.* Transmission occurs through ingestion or absorption of parasite eggs through contaminated water, food, or soil. These infections in children cause intestinal inflammation and nutritional deficiencies, leading to stunted growth, and impaired physical and cognitive development.

### Schistosomiasis (snail fever)



*Approximately 200 million infected.* Infection is caused by a blood-borne fluke found in freshwater. Infection yields blood in urine or stool, which leads to anemia and impaired

physical and cognitive development in children. In adults, life-threatening conditions of bladder cancer, kidney malfunction or liver and spleen damage may develop. Globally, 280,000 people die from schistosomiasis each year, making it the most deadly of the NTDs.

### Onchocerciasis (river blindness)

*Approximately 37 million infected.* Infection is caused by a worm transmitted via the bite of a black fly. Symptoms include intense itching, disfiguring skin conditions and eye lesions that can result in blindness. The vast majority of all onchocerciasis cases are found near the rivers and fast-moving streams of sub-Saharan Africa.

### Lymphatic Filariasis (elephantiasis)



*Approximately 120 million infected.* Infection is caused by mosquito-borne filarial worms that damage the lymphatic system, causing gross disfiguration and incapacitation from swollen limbs and genitals as well as thickened,


rough skin. The worms' larvae circulate in the skin, causing intense irritation.

### Trachoma (blinding trachoma)

*Approximately 84 million infected.* The world's leading cause of preventable blindness is a bacterial infection transmitted through flies and poor hygiene. Over time, the upper eyelid develops scar tissue, eventually turning inward and causing the eyelashes to scratch the cornea, resulting in blindness.

### Other NTDs

In addition to the seven most common, several other NTDs cause significant suffering and promote the continuation of poverty in developing communities. These include: Buruli ulcer, leishmaniasis, leprosy, African sleeping sickness (human African trypanosomiasis), dengue/dengue hemorrhagic fever, Chagas disease and guinea worm (dracunculiasis).



The Sabin Vaccine Institute expresses its gratitude to our donors, partners, and supporters whose numerous contributions ensure the continued success of our programs.

