



A Call to Action: Addressing Soil-transmitted Helminths in Latin America & the Caribbean



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The Global Network for Neglected Tropical Diseases, the Inter-American Development Bank (IDB) and the Pan American Health Organization (PAHO), are leading the Latin America and the Caribbean NTD Initiative to develop a comprehensive approach within the region to combat the seven most common neglected tropical diseases (NTDs), with the help of funding from the Bill & Melinda Gates Foundation. Leveraging IDB's financial facilities and experience in project implementation, PAHO's technical expertise, and the Global Network's advocacy and fundraising capabilities, the Latin America and the Caribbean NTD Initiative is facilitating a comprehensive expansion of efforts within the region to address the current treatment gap for children and adults affected by NTDs.

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A Call to Action: Addressing Soil-transmitted Helminths in Latin America & the Caribbean.

This report was developed with the input of various professionals working on neglected tropical disease control and elimination. Special thanks goes to those who participated in the review of this report. Photos provided courtesy of Fundación Mundo Sano, the Inter-American Development Bank, APCO Worldwide, and Ryan Hart.

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Dear regional leaders, public health advocates and colleagues:

Countries throughout the Americas have recommitted themselves to achieving the Millennium Development Goals by 2015, just four short years away. Governments have pledged to improve the quality of education; raise rural incomes and invest in economic development; increase agricultural productivity; and improve the health and nutritional status of their citizens, especially mothers and young children.

While many efforts are underway to meet these pledges, a group of neglected diseases are afflicting vulnerable and marginalized populations, and still represent an outstanding debt with the Region's development, standing as an obstacle to ultimate success. Among at-risk populations, children are disproportionately affected by three parasitic intestinal worms known collectively as soil-transmitted helminths.

At least 46 MILLION children in the Americas are at risk of these parasitic infections. The health of these children is further strained by limitations in access to health care, clean water supply, adequate sanitation, and income security. For infected children, intestinal parasites cause anemia, vitamin A deficiency, stunted growth, malnutrition, and impaired physical and cognitive development. They reduce school attendance among children and impair their ability to pay attention in the classroom.

These diseases not only represent a tremendous health burden, but they also keep those affected trapped in poverty, sadly ensuring that the most marginalized and vulnerable populations remain in a vicious cycle.

Fortunately, there are highly cost-effective, proven interventions to treat intestinal parasites. By treating these diseases once or twice a year, countries in the Americas could begin to:

- rid millions of children from the burden of these diseases;
- significantly improve their quality of life; and,
- increase their potential and future socioeconomic development through better educational performance.

The good news is many governments and other groups are already conducting deworming campaigns, yet significant coverage gaps remain in some countries. Deworming interventions, however, can be easily integrated into various existing programs that many countries and their partners are already implementing in health, nutrition, immunization, education, water and sanitation, and income support.

The Global Network for Neglected Tropical Diseases, an initiative of the Sabin Vaccine Institute, along with its partners at the Pan American Health Organization and the Inter-American Development Bank are prepared to support countries in developing comprehensive approaches to combat these chronic diseases. Our hope is that this report will inspire action, beginning with national leadership, in developing and implementing action plans for deworming.

In the following pages, scientific evidence and data on the burden of these conditions and the cost-effectiveness of existing interventions will encourage you to do more in the fight towards a generation of children free from parasitic infections. Models for integrating deworming with other health and social welfare

programs, at low cost and with great efficiency, are also presented. Lastly, concrete recommendations for translating the political will many governments have already shown on this issue are laid out as specific interventions that can benefit millions of children.

Local, national, and regional leadership is needed if we are to meet the Millennium Development Goals by 2015. Building on the Region's strong history of implementing successful programs to defeat polio, measles and rubella, Latin America and the Caribbean are now well poised to address the treatment gap of children affected by intestinal parasites. Together, with mobilized political will and the awareness of key partners and people affected, we can truly end the neglect of these diseases.

To all those who have contributed to research and innovation, to implementation of community practices, as well as to national and international funding, thank you for your continued leadership and support. We invite you to continue expanding partnerships to achieve the necessary impact in the near future as an essential contribution to the sustainable development of the Region.

Sincerely,



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Table of Contents

Introduction	1
Executive Summary	4
Chapter 1: Neglected Diseases, Neglected People	7
Chapter 2: Why Launch a Campaign Against Worms Now?	13
Chapter 3: Recent, Successful Innovations in Deworming	19
Chapter 4: Recommendations	24
Conclusion	33
Appendix	34
Endnotes	35

Executive Summary

Soil-transmitted helminths infect millions of people across Latin America and the Caribbean, especially young children and pregnant women. The illnesses caused by these intestinal parasites slow the mental and physical growth of children, complicate pregnancies and birth outcomes, and have long-term effects on educational achievement and economic productivity. Parasitic worms disproportionately affect the most disadvantaged, particularly in rural areas and urban shantytowns, and help trap vulnerable people in a cycle of poverty. **Achieving the Millennium Development Goals (MDGs) will be difficult without concerted action to free people across the Americas from this burden, which prevents people from reaching their full potential.**

The Global Network for Neglected Tropical Diseases (Global Network), a major initiative of the Sabin Vaccine Institute, in partnership with the Pan American Health Organization (PAHO) and the Inter-American Development Bank (IDB), prepared this report on the devastating impact of intestinal worm infections in Latin America and the Caribbean. The report highlights several opportunities to scale up deworming programs at low cost with great returns in the economic health and well-being of children and adults throughout the Hemisphere.

"Chapter One: Neglected Diseases, Neglected Children" describes the scope of the problem presented by infections from intestinal worms in the Americas, including the known prevalence data and the short- and long-term consequences of the parasites for children, pregnant women and adults.

"Chapter Two: Why Expand Campaigns Against Parasitic Worms Now?" explains that the governments of the Western Hemisphere have already committed themselves at the regional and international levels to taking greater action against soil-transmitted helminths, and that international organizations have established clear technical guidance for administering wide-scale treatment to control the parasites. The chapter makes the explicit link between deworming and meeting the MDGs, as well as fulfilling the mandates of the Strategic Plan 2008-2012 of the Pan American Health Organization, the PAHO Health Agenda for the Americas 2008-2017, and resolutions adopted by the World Health Assembly and the PAHO Directing Council.

"Chapter Three: Initial Achievements in Deworming" argues that the tools exist for governments and their partners to widen the scope of their efforts to control parasitic worms through integrating deworming with primary health care and ongoing public health interventions, especially by focusing on children. The chapter

presents studies that have shown deworming is one of the most cost-effective investments in health today, and offers models from other parts of the world that are ready for adaptation in the Americas as well. This paper concludes that taking advantage of existing infrastructure including schools, immunization programs, government benefit schemes, and water-and-sanitation projects can make mass deworming affordable and mutually reinforcing of other initiatives in health and economic development.

"Chapter Four: Recommendations: How to Scale Up Current Efforts" offers recommendations so deworming and improvements in water quality, waste management, health education and sanitation can succeed in lifting people out of poverty throughout the Americas. These recommendations are broken down into four areas:

1. Developing National Deworming Policies and Plans of Action;
2. Bundling Mass Treatment against Worms with Other Health Care Delivery Systems;
3. Leveraging National Social Welfare Campaigns, the Private Sector, Government Benefit Programs and Community Mobilizations; and,
4. Mobilizing Political and Social Leadership.



Neglected Diseases, Neglected People

Across Latin America and the Caribbean, millions are suffering today from the effects of parasitic worms, known to scientists as soil-transmitted helminths. Millions more are infected with soil-transmitted helminths than are infected with HIV/AIDS, malaria, and tuberculosis combined.¹

Infections by the debilitating parasites roundworm (*Ascaris lumbricoides*), whipworm (*Trichuris trichiura*) and hookworm (*Necator americanus* or *Ancylostoma duodenale*) occur all over the world, transmitted to humans through soil, vegetation, food and water contaminated by fecal matter that contains the eggs of the parasites. After individuals have consumed the eggs inadvertently, or the larvae of the worms have burrowed into their skin from the ground, the larvae travel through various pathways to the intestines, where adult worms can live for one to five years, depending on the species. (This paper will refer to these organisms interchangeably as “soil-transmitted helminths,” “intestinal parasites” and “parasitic worms.”)

Illnesses Associated with Infection by Parasitic Worms	
Type of Illness	Signs of Illness
Nutritional Impairment	Intestinal bleeding, anemia
	Malabsorption of nutrients
	Competition for micronutrients
	Impaired growth
	Loss of appetite, reduced food intake
	Diarrhea or dysentery
Cognitive Impairment	Reduced fluency and memory
Conditions Requiring Surgical Intervention	Intestinal, biliary obstructions
	Rectal prolapse

An Enormous Burden on the Poor

The three species of parasitic worms thrive mostly in communities with dirty water, inadequate sanitation and little access to basic health care, so the poor bear the greatest brunt of infection. According to the Pan American Health Organization (PAHO), 71 administrative units (districts, states or provinces) in a recent study of 14 countries in LAC have a prevalence of parasitic worms of 20 percent or more,² the threshold at which the World Health Organization (WHO) calls these infections a generalized public health problem. In fact, some experts have called the parasitic worms “the most common infections among poor people in the Americas.”³ In some marginalized communities, prevalence rates can reach as high as 90%.⁴

In fact, some experts have called the parasitic worms “the most common infections among poor people in the Americas.”

More people are infected by each of the soil-transmitted helminths than any of the other neglected tropical disease (NTDs) within the hemisphere.⁵ As measured in disability-adjusted life years (DALYs), or the number of years of “healthy” life lost because of chronic illness or disability, PAHO estimates intestinal worms constitute 15 percent of the burden of disease in the Americas from NTDs. To exacerbate this issue, these individuals make up the poorest of the poor, and live on less than \$2 per day.

Most of this population is concentrated in rural areas, where the elderly, women, and children suffer disproportionately, in addition to shantytowns or slums in and around big cities. Indigenous populations and Afro-descendent communities are also at especially high risk.

“The parasites undermine the cognitive development of young children: they diminish the ability to learn, increase memory loss and lower IQ levels. In fact, scientists have estimated children lose an average of 3.75 IQ points for each infection with intestinal worms.”

While local or provincial-level studies of the prevalence of intestinal parasites in Latin America and the Caribbean are often excellent, one challenge to the scale-up of deworming programs is that nationwide data are spotty and sometimes out-of-date. For example, until a study began this year, the last nationwide survey of soil-transmitted helminths in Brazil took place in 1950. PAHO maintains a database of more than 526 studies on the prevalence of these parasites that shows only eight of the 35 countries in the region have recently undertaken national surveys of the presence of parasitic worms.⁶ Meanwhile, twelve other countries have older studies that only covered small areas or portions of the population, showing that more intensive work is needed in many countries to map intestinal worms on a national scale.⁷

Children are Key

The detrimental impact of these soil-transmitted helminths strikes at the earliest stages of child development. Parasitic worms cause health problems among pregnant women and their babies, including serious anemia that can become life-threatening. Because the worms steal nutrients from expectant mothers, they hinder the growth of fetuses in the womb and cause low birth weight among newborn infants.⁸

Children are the target group of greatest priority for treatment, because of the exhausting effects of infections by soil-transmitted parasites. An estimated 46 million preschool and school-aged children are at risk of infection by parasitic worms in the region because they do not have access to appropriate sanitation.⁹ This equates to 15 percent of school-aged children in Latin American and Caribbean cities, and more than half of all children in rural areas from Mexico to Argentina.¹⁰ Yet only between 23 and 33 percent of these children are receiving treatment.¹¹

Parasitic worms cause diarrhea and vomiting, as well as chronic pain and anemia, which cause children to miss school frequently, and to perform more poorly when they do go to class.¹² These infections also limit physical growth, both in

terms of weight and height, as the worms rob children of iron, protein and other vital nutrients. In addition, infected children often eat less than they need, because the worms (especially hookworm) can suppress appetite.¹³ After being treated, children who had been suffering from intestinal worms often show rapid “catch-up” weight gain, as their bodies can once again capture the full nutritional benefit of meals.

Intestinal worms affect children more than anyone else; they are most often infected between the first and third year of their lives. **The parasites undermine the cognitive development of young children: they diminish the ability to learn, increase memory loss and lower IQ levels. In fact, scientists have estimated children lose an average of 3.75 IQ points for each infection with intestinal worms.**¹⁴

Additionally, estimates suggest long-term infections with these worms can limit earning potential by as much as 43 percent.¹⁵ In short, for millions of children across the Americas, the parasites they carry are depleting or minimizing their strength to learn and grow, limiting their full potential.

Treatment against parasitic worms, where it occurs, typically overlooks one crucial segment of the population. Very young children are excluded from most campaigns against intestinal worms—which usually take place in schools—even though many children begin to acquire the parasites as soon as they are able to crawl. Treating children earlier promotes better growth, allows a toddler to be more prepared to learn when he or she reaches school age and reduces the overall presence of worms in some communities.¹⁶ Studies have shown children who are not yet enrolled in school have higher levels of infection by intestinal parasites, so giving this group deworming drugs is quite cost-effective.¹⁷ It is important to note, that not all current treatment formulations are appropriate for preschool-aged children. Therefore, new age-appropriate pediatric formulations, including liquid form, are needed to reach this younger population with essential medicines.¹⁸

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Prevalence of Soil-Transmitted Helminths in Highly Affected Countries in the Americas	
Bolivia	34.9%
Brazil	19.0%
Colombia	30.0%
Dominican Republic	30.3%
Ecuador	49.8%
Guatemala	40.4%
Guyana	25.2%
Haiti	51.0%
Honduras	62.5%
Mexico	8.2%
Nicaragua	53.5%
St. Lucia	40.0%
Suriname	39.5%
Venezuela	11.0%

Safe and Effective Medicines Offer Hope

The good news is that there is no longer any reason for these parasites to undermine the health of children. The availability of simple technologies, smarter strategies, and improvements in health care infrastructure and delivery mean it is possible to control parasitic worms, even in poor communities. Safe, inexpensive drugs such as albendazole and mebendazole work quickly to kill the parasites, and multi-national pharmaceutical companies are providing these medicines at no cost in many places. Other pharmaceutical firms are also producing generic versions of these drugs in many countries. In a number of countries, campaigns against lymphatic filariasis and river blindness (onchocerciasis) are using ivermectin and diethylcarbamazine or albendazole, which kill intestinal worms at the same time. The WHO recommends that children who live in areas where the prevalence of the parasites is between 20 and 50 percent should have at least one dose of deworming medicine each year, and those who live where prevalence is greater than 50 percent should receive treatment twice a year. WHO guidelines suggest the target for this treatment should be at least 75

percent coverage of the population at risk during each administration of the pills, so as to limit the chances that infected people in the community can pass the worms easily on to others, or cause reinfection. This is because public health experts estimate that 20 percent of any population with intestinal parasites plays host to 80 percent of the worm population in the area, so not only are these people the most likely to suffer from malnutrition, they are the ones who are spreading the infection to others, since they pass a greater number of parasite eggs in their feces.¹⁹

Cost-effective Interventions

Researchers have found that preventive treatment to fight the five most-common neglected tropical diseases, including parasitic worms, is one of the most cost-effective health interventions in the developing world.²⁰ These and other scholars have suggested the rates of return on controlling diseases like infections by soil-transmitted helminths could be as high as 15 to 30 percent.²¹

One study, performed in Kenya, indicated that every US\$4 invested in mass deworming treatment bought one more year of schooling, while other approaches (such as buying uniforms, paying school fees, providing textbooks, or giving incentives to teachers based on attendance and drop-out rates) had to spend between US\$38 and US\$99 to achieve the same outcome.²² Compared to many other public health and medical interventions, deworming is a great bargain: A recently published analysis predicts mass drug treatment for intestinal worms in Latin America to range

Comparative Costs for Deworming Strategies	
Treatment Strategy	Cost per Treatment in US\$
Mobile Teams	\$0.21 - \$0.32
Schools	\$0.03 - \$0.04
Out-of-School Youth	\$0.16 - \$0.21

Guyatt, H.L., "The Cost of Delivering and Sustaining a Control programme for Schistosomiasis and Soil-Transmitted Helminthiasis," *Acta Tropica*, 2003, 86:267-74.

“Studies have shown children who are not yet enrolled in school have higher levels of infection by intestinal parasites, so giving this group deworming drugs is quite cost-effective.”¹⁷

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between US\$0.08 and US\$0.76 per child in each round of administration over five years.²³

Deworming has an incredible impact on the quality of life for children and adults. The gains also extend to schooling and future productivity in the workforce. Studies have found that deworming can increase adult income by an estimated 40 percent.²⁴

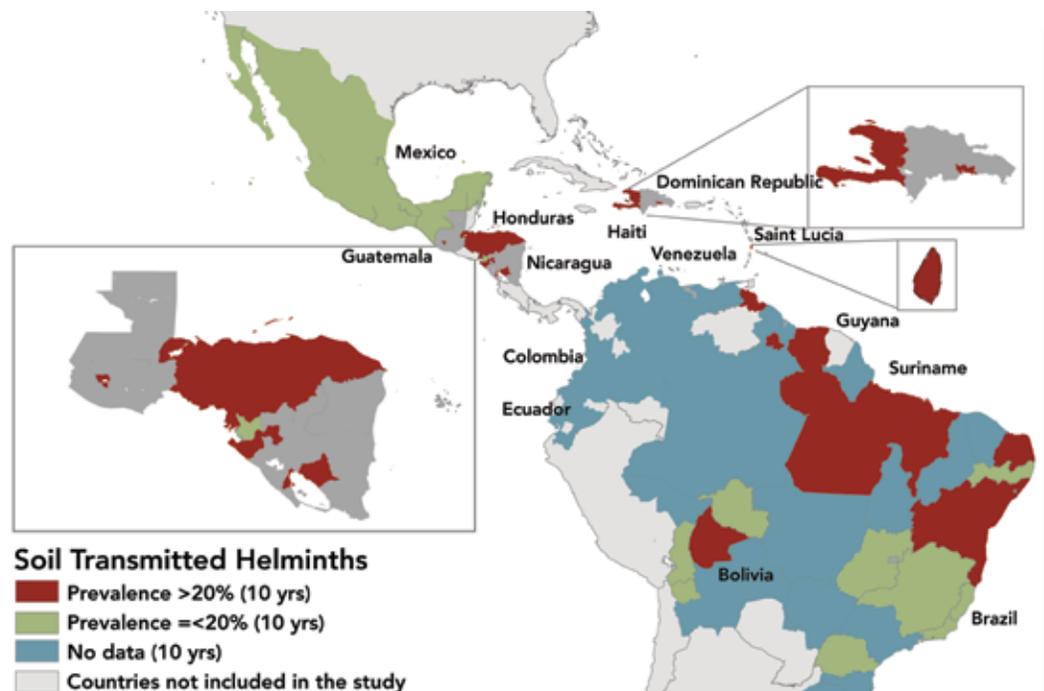
Part of the cost-effectiveness of deworming comes from its ability to make other interventions more successful. For example, children in school feeding programs will eat better when their bellies are free from worms. And deworming could also be an important tool in the

fight against cholera, now devastating Haiti, since preliminary research suggests the intestinal parasites reduce the human body's immune response to the cholera toxin and might interfere with the vaccine against the disease.²⁵

Deworming, Clean Water and Sanitation Together are the Best Answers

As effective as mass treatment can be, until a vaccine is developed, the most sustainable way to conquer parasitic worms in the long term is to combine the medicine with investments in economic development, hygiene education, clean water and modern sanitation facilities in local communities. The proper disposal of human waste is especially critical, since

Scientists estimate that 20 percent of any population with intestinal parasites play host to 80 percent of the worm population in the area, so not only are these people the most likely to suffer from malnutrition, they are the ones spreading the infection onto others.



Source: Epidemiological Profiles of Neglected Diseases and Other Infections Related to Poverty in Latin America and the Caribbean, Pan American Health Organization, Washington, D.C., 2009, p.24.

one gram of feces can contain as many as 100 parasite eggs;²⁶ contaminated water supplies can therefore infect, and reinfect, people across an entire town or village. Agricultural irrigation reliant on treated wastewater, waste-stabilization ponds and other methods can also decrease the transfer of parasite eggs to food crops. Once a community has access to proper sanitation, everyone in the community must be educated on the proper use of latrines and the importance of hand-washing in order to keep families safe and healthier between deworming doses.

We Can Do So Much to Control Intestinal Worms Now

Intestinal worms exert a detrimental impact across the Americas, especially among the poor, who are most at risk. Accelerating the fight against these parasites cannot and should not wait for infrastructure

improvements that may take many years to plan, finance and build. Mass drug administration campaigns offer a low-cost, short-term solution, but need to be combined with other health programs. Given the widespread and corrosive nature of the problem of infection with soil-transmitted helminths, along with the low costs and high economic and social return of treating for them, what is needed is enhanced political will to ensure the right combination of national resources and international assistance to promote comprehensive control strategies that bring clean water, sanitation, hygiene health education and deworming to more communities across the hemisphere. In the next chapter, we will explore why now is the time to make an enhanced campaign against intestinal worms a centerpiece of public health policy in the Americas.



2

Why Launch a Campaign
Against Worms Now?

There has never been a better time to launch a regional campaign to control parasitic worms in Latin America and the Caribbean. The political will manifested by recent resolutions on the topic at the World Health Assembly (WHA) and the PAHO Directing Council Meeting, the approaching deadline for achieving the Millennium Development Goals (MDGs), the imperatives outlined by the WHO Commission on Social Determinants of Health, and the intensifying efforts of governments, United Nations bodies and non-governmental organizations all demonstrate we have made more progress against intestinal worms in the last few years than at any other time in history.

Renewed Focus from the World Health Organization

Combating the ancient plague of soil-transmitted parasites has been on the agenda of the WHO nearly since its founding. Governments first committed themselves to greater, more concerted action against soil-transmitted helminths in 1950, asking the WHO Secretariat to organize itself to help in the effort, through WHA Resolution 3.26. In the intervening decades, WHO initiatives such as the Special Programme for Research and Training in Tropical Diseases have investigated the safety and efficacy of existing medicines to cure infection by hookworm, whipworm and roundworm, and have helped move promising new candidate drugs into field trials. Perhaps the most important achievement of this work was establishing the scientific basis for treating large numbers of people safely to prevent illness from worms, a technique known as "preventive chemotherapy."

In 2001, governments from around the globe reached an important consensus on how best to approach the control of parasitic

worms by endorsing WHA Resolution 54.19. For the first time, nations offered political backing to the strategy of giving deworming medicine to children and other high-risk groups on a regular basis as part of investments in sanitation, the provision of safe water and the improvement of hygiene. Through Resolution 54.19, the nations of the world adopted the first common targets and metrics for progress, including the benchmark of at least 75 percent coverage for treatment among school-aged children at risk. The coordinated, mass administration of medicines to treat multiple intestinal worms became an international standard after this point.

Soon after, the WHO Secretariat began to strengthen alliances in order to make intestinal worms a higher priority among public health advocates and practitioners. These partnerships came together to determine the most effective methods to

The WHO Director-General, Dr. Margaret Chan, recently called attacking tropical diseases such as parasitic worms a 'pro-poor strategy at a grand scale' that is much cheaper to put into practice than many other methods attempting to lift people out of poverty.

implement the political commitments shown by member nations and the technical approaches endorsed by the WHA. The 2006 WHO publication, *Preventive Chemotherapy in Human Helminthiasis: Coordinated Use of Anthelmintic Drugs in Control Interventions*, was the first manual for health professionals on how to treat parasitic worms, and has offered doctors and health planners clear guidance on the best and safest ways to deworm children and other infected populations. The manual reinforces the WHO's research which has demonstrated that a clinical diagnosis is not necessary in order to treat, thus community health workers and other laypeople can deliver the medicine outside of formal hospitals and clinics.

With these medical, programmatic and political breakthroughs as a foundation, the WHO Secretariat then developed its *Global Plan to Combat the Neglected Tropical*

World Health Assembly Resolution 54.19

The Fifty-Fourth World Health Assembly endorses as the best means of reducing mortality and morbidity and improving health and development in infected communities, the regular treatment of high-risk groups, particularly school-age children, and ensured access to single-dose drugs against...soil-transmitted helminth infections in primary health-care services, complemented by the simultaneous implementation of plans for basic sanitation and adequate safe water supplies.



Diseases, 2008-2015 to “prevent, eliminate or control” these infections by 2015. One of the plan’s three goals addresses targets for parasitic worms: to reduce significantly the burden of these diseases through a set of safe, simple and low-cost interventions, such as mass treatment.

This momentum has continued, and most recently, in October 2010, the WHO Secretariat released its first comprehensive report on intestinal worms and other neglected tropical diseases, entitled *Working to Overcome Neglected Tropical Diseases*. Based on years of scientific research and public health practice, the document concludes that “[a] strategy of preventive chemotherapy, which mimics the advantages of childhood immunization, [can] protect entire at-risk populations and reduce the reservoir of infection.”¹ The WHO also highlights the kind of partnerships between governmental institutions (including schools), civil society and the private sector that are essential to successful deworming campaigns.

Achieving the Millennium Development Goals Means Controlling Intestinal Worms

Given the negative health, social and economic impact of intestinal worms, controlling these parasites is critical to

reaching the MDGs. Seven of the eight MDGs are dependent, in part, on making sure mothers and children are free of these parasites:

- At the recent September 2010 Millennium Summit in New York, heads of state and government endorsed a *Global Strategy for Women’s and Children’s Health*, which forcefully asserts that the fulfillment of **MDG 1** will depend on “further efforts at the community level [that] must make nutritional interventions (such as exclusive breastfeeding for six months, use of micronutrient supplements and deworming) a routine part of care.”²
- Perhaps no intervention offers greater promise for improving the consistent school attendance essential to **MDG 2** than deworming, since studies have shown treating children for worms can reduce absenteeism in primary schools by 25 percent.³
- Education is critical to empowering women, as envisioned by **MDG 3**, and projects have shown deworming, in conjunction with mid-day meals, can increase enrollment in school by girls by more than 40 percent.⁴
- Reductions in anemia among pregnant women, improvements in fetal health and increases in the birth weight of babies produced by treatments to kill

Based on years of scientific research and public health practice, the [WHO report] concludes that “a strategy of preventive chemotherapy, which mimics the advantages of childhood immunization, [can] protect entire at risk-populations and reduce the reservoir of infection.

intestinal worms can contribute to the targets of reducing infant mortality and strengthening maternal health in **MDGs 4 and 5**.

- There is growing evidence that intestinal worms can worsen HIV infection and malarial episodes, both of which can undermine progress towards **MDG 6**.⁵
- Reducing a population's overall burden of intestinal worms will keep drinking water safer and sewers cleaner, the essence of **MDG 7**, and improvements in water and sanitation are the surest way to sustain the control of the parasites over the long term.

Millennium Development Goals (MDGs) Connected to Deworming	
MDG 1	Eradicate extreme poverty and hunger
MDG 2	Achieve universal primary education
MDG 3	Promote gender equality and empower women
MDG 4	Reduce child mortality
MDG 5	Improve maternal health.
MDG 6	Combat HIV/AIDS, malaria and other diseases
MDG 7	Ensure environmental sustainability – safe drinking water and sanitation.

Strengthening the Political Commitment to Deworming in the Americas

No part of the world has shown greater political and scientific commitment to eliminating and controlling disease than the Americas. These countries have a long history of triumphs in public health, including being the first region to eliminate polio, measles, congenital rubella syndrome and endemic goiter. Greater action to reduce the burden of parasitic worms would fall squarely within this tradition.

The new WHO report on neglected tropical diseases emphasizes that “successful and sustainable control [of intestinal worms]

depends on the political commitment and ownership of interventions by Governments of countries where the diseases are endemic.”⁶ Some leaders in the Americas have embraced deworming as a personal cause and important component of their political platforms. For example, at the World Economic Forum in January 2009, President Bharrat Jagdeo of Guyana announced his pledge to treat all school-aged children in his country for intestinal parasites by the end of that year.

On a broader scale, fighting intestinal worms is already part of a series of hemisphere-wide plans on which the governments of the Americas have agreed. Deworming campaigns are a necessary step in completing the blueprints for advancing the health and well-being of all citizens in Latin America and the Caribbean:

In 2009, the governments of the hemisphere committed themselves to major collective and individual action against the so-called “neglected diseases,” including parasitic worms, through **PAHO Directing Council Resolution CD49.R19**. The Resolution sets a target of the year 2015 to ensure these conditions are no longer a public health problem anywhere in the region. Control of soil-transmitted helminths would contribute to fulfillment of PAHO’s **Health Agenda for the Americas, 2008-2017**, including fortifying primary health care and making progress on equity and gender, since the parasites affect expectant mothers so adversely. The Health Agenda of the Americas also specifically emphasizes attacking diseases that disproportionately affect the poor.

Deworming clearly will help the implementation of the **PAHO Strategic Plan for 2008-2012**, which has as one of its emphases “to diminish unjust and remediable health inequalities among populations, while addressing health determinants in such a way that takes into account human development and by reducing the weight of communicable diseases—especially by revisiting the fight against forgotten diseases that tend to affect poverty-stricken [communities]....”

“
Successful and sustainable control [of intestinal worms and other debilitating conditions] depends on the political commitment and ownership of interventions by governments of countries where the diseases are epidemic.
 – WHO Report, *Working to overcome the global impact of neglected tropical diseases*”

Combining Forces Against Worms in Nicaragua

Nicaragua provides a compelling case for how powerful cooperative efforts against intestinal worms can be. With funding from Vitamin Angels, a consortium of charities that includes Save the Children, Medical Assistance Programs International, Amigos for Christ and the Rainbow Network, linked to government-run maternal and child health clinics to distribute deworming medicine, vaccinations and micronutrient supplements to more than 894,000 children in rural areas in 2009 alone.

International Partners Are Ready to Join with Governments to Expand Deworming Programs throughout the Hemisphere

Political commitments in health often fall short because carrying out promises is difficult given the numerous competing priorities that a government encounters. Yet, in the Americas, dozens of non-governmental organizations (NGOs), international donors and United Nations (UN) agencies are forming partnerships with governments to help them fulfill their promises to bring the social, educational and health benefits of deworming to millions of people:

UNICEF has treated hundreds of thousands of children for intestinal worms as part of immunization campaigns in Haiti since the devastating earthquake of January 2010.

Planting Peace has already reached 7.9 million children over the last several years with its "Stomp the Worm" project in Haiti.

Children Without Worms is working with the Ministry of Health of Nicaragua to provide deworming medicine donated by Johnson & Johnson to more than 1.5 million schoolchildren this year.

The Catholic Medical Mission Board is partnering with Church-affiliated health networks to add deworming treatment to existing programs on maternal and child health in Central and South America.

World Vision U.S.A. and **World Vision Canada** are organizing campaigns against intestinal worms in Bolivia, Ecuador, El Salvador, Haiti and Honduras.

The Worm Project (Franconia Mennonite Conference) operates treatment projects against intestinal parasites in Belize, Ecuador and Jamaica.

Deworm the World funds initiatives in Guyana and Haiti.

The World Food Programme included deworming in its feeding efforts in Haiti and Honduras, as part of a worldwide integration of treatment for intestinal parasites into the organization's work.

Vitamin Angels cooperates with local partners to give anti-parasitics and vitamin A supplements to children in Belize, Bolivia, the Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua and Peru.

WOW Now makes the distribution and administration of medicines against parasitic worms in Belize, Ecuador and Jamaica a central component of its mission.

Save the Children emphasizes deworming as a focus in the Dominican Republic, Haiti and Nicaragua.



We Can Capitalize on this Energy to Do Even More

All of the groups mentioned above—and more—stand ready to do more in cooperation with officials throughout the hemisphere. Together, governments and non-governmental organizations can implement one of the most cost effective and efficient ways to improve the health of children and mothers. In this chapter, we have seen why the timing is right to do so. The Governments of the Americas have signed onto commitments at both the regional and global levels to bring

soil-transmitted helminths under control. Deworming is necessary to achieving the MDGs, will help ensure the human rights of the region's most vulnerable citizens and will contribute to implementing the recommendations of the WHO Commission on Social Determinants of Health. Finally, the WHO has issued clear technical guidelines for preventing and treating the infections caused by parasitic worms. The next chapter will suggest how to take advantage of this momentum by detailing specific examples of recent, successful innovations in deworming.



3

Initial Achievements in Deworming

Employing deworming as a strategy to fulfill Latin American and Caribbean governments' political commitments on health does not have to be expensive— treating large numbers of people for parasitic worms has proven to be one of the most cost-effective interventions available to improve well-being as well as economic and educational performance. The medicines are inexpensive, easy to administer, safe and quickly effective; while scientists are keeping a close eye on the situation, resistance to the major drugs that kill the worms has so far not developed, in contrast to what has happened with medicines for many other diseases.¹ As the late WHO Director-General J.W. Lee wrote in 2004, "The health benefits of treating school-aged children, preschool children as young as 12 months, and pregnant women with anthelmintic drugs greatly outweigh the risks of possible minor side effects."²

Growing Momentum in Treating Parasites

The last few years have seen governments and non-governmental partners in a number of countries in Latin America and the Caribbean take major steps forward in providing deworming treatment to large numbers of children and adults at high risk.

- From 2005 to 2007, and again in 2009, nearly all school-aged children in the Dominican Republic received medicine against intestinal worms, and more than 75 percent of them received treatment in 2008.³
- In 2006 and 2009, Ecuador also reached the goal of covering at least 75 percent of eligible students enrolled in school, and Haiti, Nicaragua and Mexico did so from 2007 to 2009.⁴
- Peru, Colombia, El Salvador and Honduras have also seen great improvements in treating school-age children over the last few years, particularly through programs carried out by non-governmental organizations and church groups.

Nevertheless, in most of the region's countries, even the most successful deworming activities can be better

coordinated and integrated with other programs. Many nations in the Americas are missing opportunities to combine treatment for soil-transmitted helminths with other public health interventions, including immunizations, safe-motherhood programs, and feeding and nutrition initiatives. A large number of private charities, some operated by missionaries or other faith-based organizations, are now including deworming in their health and educational work. Often conducted in remote areas, national governments do not always account for these efforts in their planning or outreach. Better monitoring and evaluation of programs to control intestinal worms are also necessary to ensure governments and non-governmental organizations are using resources wisely, maintaining high-quality programs and focusing on the most-affected communities.

A Low-Cost Investment, No Matter the Delivery Channel

Attacking worms is also remarkably inexpensive, no matter how the tablets reach people. The once- or twice-yearly schedule for treatment lends itself well to synchronization with many other ongoing activities. Mass deworming does not require the supervision of a physician and can take place in virtually any setting, including schools, clinics, community centers, churches, even people's homes. With only a few hours of training, teachers, community health workers and lay volunteers can learn why treating parasitic worms is important, how to distribute medicines and how to maintain proper records. (These activities should always include regular monitoring, including for adverse reactions, gaps in coverage and the possible growth of resistance to the drugs among the parasites.)

Treating Schoolchildren for Worms is Efficient and High-Impact

A growing body of evidence over the past decade suggests that providing deworming medicine to children through schools is significantly cost-effective and high-impact. As the WHO-sponsored *Report of the Third*

Global Meeting of the Partners for Parasite Control concluded “Now that safety-tested, effective, anthelmintic drugs cost no more than a few cents per dose, this means that deworming school-aged children is probably the most economically efficient public health activity that can be implemented in any low-income country where such infections are endemic.”⁵

Perhaps the biggest advantage of distributing deworming drugs through schools is that it takes advantage of existing infrastructure, which is why this method can cost less than distributing the medicine through mobile clinics or separately finding children who are not enrolled in schools. Teachers and other educational staff do not require lengthy orientation programs to learn how to distribute treatment to their students and it is easy for them to track the medicine as part of their normal keeping of attendance and other records in the classroom. Children not enrolled in school can be invited to the schools on deworming day. A major recent study broke down the costs of government-delivered, school-based deworming in a more comprehensive way

that indicates the kind of investments Latin American governments might need to launch deworming campaigns among schoolchildren.⁶ The authors calculated an “average unit *financial* cost per child treated” of US\$0.38, which accounted for all cash outlays each year for training, management, community mobilization, educational materials and distributing drugs. Then, the researchers established an “average unit *economic* cost per child treated” of US\$0.54, which included all the financial expenses above, including drugs, and an additional estimation of what it cost to use ministry of health staff and school teachers, plus a share of annualized capital costs. One pattern was clear—the more children treated the better value the program became.⁷

A complete deworming program in schools should also focus on making the environment of the schoolhouse cleaner and safer. Children need instruction in proper hygiene, especially hand-washing, which should be part of every school’s culture, and all schools need well-maintained latrines and enough clean water for handwashing.

“
Now that safety-tested, effective anthelmintic drugs cost no more than a few cents per dose, this means that deworming school-aged children is probably the most economically efficient public health activity that can be implemented in any low-income country where such infections are endemic.”⁵

– WHO-sponsored Report of the Third Global Meeting of the Partners for Parasite Control

”

Estimated Costs to Control Parasitic Worms in the Americas Over Five Years

Country	Predicted Average Unit Cost	Total Number of Treatments Delivered	Discounted Total Cost (present value of these costs in 2009 dollars)
Bolivia	\$0.25	4,774,672	\$1,171,103
Brazil	\$0.56	31,030,672	\$16,769,195
Colombia	\$0.40	5,677,695	\$2,050,212
Dominican Republic	\$0.37	3,585,858	\$623,155
Ecuador	\$0.45	3,525,671	\$483,256
Guatemala	\$0.32	7,673,706	\$1,717,728
Guyana	\$0.22	184,395	\$41,430
Haiti	\$0.08	6,757,849	\$542,621
Honduras	\$0.22	3,242,808	\$480,388
Mexico	\$0.76	29,474,118	\$12,135,715
Nicaragua	\$0.17	4,554,241	\$497,334
Saint Lucia	\$0.62	12,205	\$7,344
Suriname	\$0.49	22,517	\$10,788
Venezuela	\$0.69	6,588,175	\$4,307,149
Total	\$0.38	107,104,583	\$40,837,417

Source: Bitrán Ricardo and others Regional Study to Estimate the Cost of Preventing, Controlling, and Eliminating Selected NTDs in the Americas Bitrán & Asociados/Inter-American Development Bank. - 2009

Integration, Integration, Integration

Whatever the method, deworming is most sustainable and cost-effective when it takes place as part of another, ongoing public health activity or as part of existing health systems. **Research emphasizes integration can reduce the expense of mass treatment for parasitic worms by as much as 47 percent.**⁸ To achieve these gains systematically, governments and their partners need to develop national deworming action plans with clear objectives and assignments of responsibility.

Furthermore, treating intestinal worms often turns out to make other interventions work better, since the bodies and immune systems of children free of parasites are better prepared to receive the positive benefits of nutrition, health care and immunizations. Parents see the immediate relief their children receive when their bellies are not infested with worms, so making anti-parasitic medicine available often brings more people to health campaigns than otherwise would attend.

Latin America has many examples of integrated campaigns in which deworming fits easily and inexpensively. It is important to note, however, that most initiatives are not operating at a national scale. A lack of sustainable funding leads to frequent changes in levels of coverage, pending government funding or donor support.

- **Honduras** has found that distributing deworming medicine and vitamin A supplements together is mutually reinforcing and cost-effective. Young children who are not preyed upon by worms absorb the crucial micronutrient better and can maintain higher levels of it in their bodies for longer.⁹ Since most countries have an existing infrastructure to deliver vitamin A, including in very remote areas, combining vitamin A and albendazole or mebendazole can be done with no extra distribution costs and can reduce anemia in children by more than 75 percent in one year.¹⁰
- The World Food Programme has found its school feeding initiatives in **Haiti, Honduras** and **Peru** work better with twice-yearly deworming. As experts have put it, “Nobody would want to fill a leaking bucket with water,” since parasites in children’s intestines steal so much of the nutrients the meals are meant to provide.¹¹
- For many years, **Mexico** has successfully included medication to treat worm infections as part of the package of care and screening offered during its biannual National Health Weeks. The chance to rid children of the parasites brings many parents in rural areas to the government-sponsored health fairs in market towns. **Haiti** has also begun adding deworming drugs to the menu of components for its child health weeks. The bundling of treatment against intestinal worms with other benefits that people are expecting makes it a normal and routine part of families’ yearly schedule.
- Including deworming as a part of water and sanitation projects keeps the water supply safer for consumers and makes families healthier at the same time. In **Haiti**, the water authority is using part of a US\$15 million grant from the Inter-American Development Bank (IDB) intended to improve the municipal water system in Port au Prince, treat the city’s population for intestinal parasites, renovate toilets at schools and teach appropriate hygiene to children, teachers and health workers. Similar components are in the planning stages in IDB projects in several other countries over the next

Under Haiti’s inclusion of deworming medications into routine medical schedules, the country is projected to achieve national coverage of children in 2011.

year. In Chiapas, **Mexico**, IDB and the state government convinced private-sector firms to relocate planned water-treatment plants to areas of greater need, which was determined by the mapping of the burden of intestinal worm infections. Finally, in **Guyana**, an IDB-financed project includes the mass administration of albendazole to control intestinal parasites as part of improvements to urban water supplies and sanitation systems.

- **Honduras** and **Nicaragua** have married deworming with immunizations. Treating deworming tablets as part of the regular schedule of vaccinations all children should receive guarantees an almost nationwide reach for the treatment at almost no additional cost. Nurses and community health workers who give children their shots can easily administer the anti-parasitics to these children during these scheduled immunizations.

Looking Forward to a Hemisphere without Worms

Dollar for dollar, peso for peso, deworming is one of the best investments in improving the life prospects of a country's citizens. Whether toddlers or school-aged children are targets, the benefits of controlling intestinal parasites in communities extend to better health, better growth, better learning and better earning. A number of countries in the Americas have begun programs that combine deworming with other public health and primary-care activities, although some of the initiatives featured in this chapter are not nationwide yet, and coverage has trended up and down depending on funding and donations/purchases of medicine. The next chapter will make recommendations as to how the nations of Latin America and the Caribbean can expand these efforts and make them even more effective.





**Recommendations:
Ways to Scale Up Deworming**

4

Now is the time to give childhood and bright futures back to millions of children in Latin America and the Caribbean—by combating intestinal worms on a regional scale. The medicines to do so are safe, effective and inexpensive. The governments of the region have committed themselves to a field-tested strategy to control the parasites, and now are in the position to create national plans and strategies to address soil-transmitted helminths along with other neglected tropical diseases, as needed. Experience shows, however, that the mass administration of deworming drugs is most effective and provides the best value, both in terms of cost and benefits to children and their communities, when combined with other, ongoing public health interventions. PAHO and a series of non-governmental organizations are ready to help. And, mass treatment of every child over the age of 12 months is the answer.

The following recommendations outline key provisions for treatment of soil-transmitted intestinal parasites that governments of the Americas can systematically include in their portfolios of activities at little additional cost. Adopting on a large scale any one of the suggestions below could significantly reduce the tremendous physical, mental and psychological toll wrought by painful, chronic infections caused by parasitic worms throughout the region.

Develop National Deworming Policies and Plans of Action

The first steps in attacking any public health problem are to establish appropriate policies and protocols, set measurable goals and create detailed plans to make clear who will do what to achieve the targets. Improved information about the prevalence of the condition, including its geographic concentrations, is crucial to this process. Following on work PAHO is doing in several countries, governments and their partners throughout the Americas could review their national policies on treatment for intestinal parasites, map the extent of infections from soil-transmitted helminths, and establish or revise national plans of action accordingly.

► **Create or update policies for anti-parasitic treatment**

Not every nation in the region has published clear guidelines on how to treat children for parasitic worms (what medicines to use, how often and in what dosage). All governments in the region could work with PAHO to adapt the WHO's technical recommendations on deworming for local use and ensure national drug regulatory agencies are prepared to approve and register new pediatric formulations of anti-parasitics as they come to market.

► **Undertake better mapping**

One of the most urgent problems to solve in attacking the parasitic worms is mapping in detail where the infections are present, which helps inform policy makers how to direct the allocation of scarce resources to the communities

most affected. Many nations do not have any information available; only 10 of 35 nations in Latin America and the Caribbean report on intestinal worms at the national level at all.¹ Governments and their partners in the Hemisphere could plan to execute nationwide surveys of the prevalence of intestinal worms where such studies are out-of-date or do not exist.

► **Develop national plans of action**

Based on epidemiological data, ideally from new or recent prevalence surveys, the governments of the Americas could work with donors, humanitarian organizations, faith-based groups and the private sector to develop specific national plans of action to control intestinal parasites among children and pregnant women. These plans could be cross-sectoral (involving ministries of health, education,

rural development and others, as appropriate), and need to contain clear timelines and assignments for action. Such planning must be flexible enough to account for changes in the severity and spread of infections produced by intestinal worms as programs to treat for the parasites reach more people. Finally, deworming plans must also include detailed budgets, including strategies for making funding sustainable and integrated with governments' regular processes for allocating resources.

► **Make ongoing surveillance for intestinal parasites and the monitoring and evaluation of deworming programs public health priorities**

Answering the key questions about where parasitic infestations are the most prevalent, and determining whether

efforts to control them are working well, will make all deworming treatment programs better and more efficient. The governments of the region could work with international partners to ensure all wide-scale, public health and population surveillance tools (such as national censuses, demographic and health surveys, family health surveys, national household education surveys and reproductive health surveys), include systematic questions about infections by intestinal parasites and improve the monitoring and evaluation of campaigns to rid people of the worms. At the same time, indicators on prevalence and intensity of infections caused by soil-transmitted helminths should be part of measuring the overall progress on health in each country.



Bundle Mass Treatment against Worms with Other Health Care Delivery Systems

Governments in the Americas already reach almost all of their populations, even in remote rural areas and difficult urban environments, with some kind of health program or service on a regular schedule. Including treatment for intestinal parasites with one or a few of these interventions (depending on the epidemiological situation) could operationalize national deworming plans immediately, make the interventions more effective, and ensure countries could meet the coverage levels for anti-parasitics recommended by the WHO. Just as parents have come to view inoculations and check-ups as necessary preventative measures, deworming should just be another activity in which families expect to engage with their health providers each year. Governments could introduce treatments against intestinal worms into existing platforms within the country that have strong infrastructure and broad reach, and should record the tablets each child has taken to ensure that over the course of a year the child has not consumed more medicine than is really necessary. (In many cases, the proper dosage will be one tablet per year and in no case more than three tablets per year if worm prevalence or intensity of infection is extremely high.) In some places, technical assistance could be necessary for local health officials to carry out these kinds of integrated activities correctly, which would provide an excellent way for donors to play a role in helping to expand deworming across the region.

The following options could provide leverage to scale up deworming efforts as part of a national strategy:

► **Make deworming part of routine childhood immunization programs**

This is perhaps the easiest and quickest way to take treatment for intestinal parasites to scale nationwide and to reach the most critical population at risk for infestation by intestinal parasites—children between the ages of one and five. Because every country in Latin America and the Caribbean already has an excellent infrastructure to vaccinate young children, as demonstrated by the best coverage rates in the world, adding deworming medication to the normal schedule of shots and drops given to children should cost almost nothing beyond the price of the drugs themselves, a tremendous value at just pennies per dose. Ministries of health and their partners can literally write "treatment for worms" into their immunization schedules, such that they coordinate the procurement and distribution of the medicine simultaneously with the periodicity of childhood vaccines. To make this process easier for everyone, and to avoid duplication, deworming medication could appear on vaccination cards. This way, for the first years of life,

all children could receive anti-parasitics when they get their initial shots and boosters against diseases such as pertussis, polio, tetanus and rubella, as well as when they receive vitamin A supplements. Although governments should avoid the unintentional duplicate delivery of deworming tablets if the vitamin A and immunization programs are independently distributing medications. Since the earlier children receive protection against worms the greater the chances their minds and bodies will grow properly, reaching this group with anti-helminthics right after their first birthday, and every year thereafter, will have even better results than waiting until children go to school—specific age groups must be targeted as immunization programs start as early as 6 weeks of age, which is too young for deworming. Lastly, financial support for technical assistance is necessary to integrate new interventions into vaccination weeks.

► **Put deworming on the checklist for check-ups by mothers and babies**

At least once during her pregnancy after the first trimester, every woman

who makes an antenatal visit to a health center in rural areas or urban slums could receive medication against intestinal parasites. The results will be easier, safer pregnancies and deliveries, along with babies born heavier and healthier, all for a minor investment in purchasing the drugs and in the basic training of staff at health posts. Similarly, each time she brings her baby back for annual or biannual check-ups after birth, both she and the child should receive doses of anti-parasitics as well.

► **Integrate deworming with efforts to treat other neglected tropical diseases (NTDs)**

Since many countries of the Americas are already engaged in serious mobilizations to eliminate diseases such as trachoma, schistosomiasis, lymphatic filariasis and onchocerciasis by 2015, those nations could adopt the model of delivering mebendazole or albendazole to targeted communities at the same time they receive medicine for the other conditions, as the program against lymphatic filariasis has already done. In most cases, the periodicity of treating the other NTDs matches that for controlling intestinal

parasites, and the nurses and community health workers involved in the elimination campaigns would need little training to give out the deworming tablets as part of a package of drugs.

► **Make deworming a task of community “health agents” and other door-to-door health visits**

Community health workers and child health days have been a vehicle for deworming millions of children in Africa and Asia by groups such as UNICEF and others. These successful models could be replicated in the Americas. Several countries in the Americas have created programs at the national or regional level that employ lay workers to help communities promote and improve their own health care. They generally teach families about and assist them with subjects such as breastfeeding, prenatal care, immunization and diarrhea. These community-based health agents could easily add deworming to their responsibilities, since they already receive basic instruction in health and hygiene, often have a package of medicine to deliver, and know how to keep good records.

Leverage National Social Welfare Campaigns, the Private Sector, Government Benefit Programs and Community Mobilizations

Ministries of health do not have to be solely responsible for organizing and delivering deworming. Other state agencies, non-governmental organizations and the faith-based community can all play crucial roles in ensuring every pregnant woman, toddler and child does not have to suffer from infestations of intestinal worms.

The following options could make national plans for deworming efforts even more effective by involving local partners outside of the health sector from both government and the private sector:

► **Make deworming a centerpiece of National Health Weeks or Child Health Days**

Those nations in which governments and private sector partners engage in annual, biannual or other periodic campaigns to provide health and other social services on a nationwide basis could endeavor

to deliver medicine against intestinal parasites to every child and pregnant woman during each community event. The popularity of deworming among parents would likely serve as a draw to increase participation, and ridding children and expectant mothers of their intestinal worms would make all the other



assistance more efficacious, including vaccinations, nutritional supplements and feeding.

► **Forge partnerships with churches and other faith organizations to deliver deworming**

The thousands of parochial and religious schools in the Americas, along with hospitals and clinics associated with faith-based groups, are natural and often underused partners in the fight against intestinal parasites. Because the administration of preventive chemotherapy is so safe and requires so little training, members of religious communities can easily learn to give the tablets to children and pregnant women in their congregations. Churches, mosques and temples all have social events and outreach activities throughout the year that could be excellent venues for deworming, and in some areas missionary clinics and health workers are more likely to provide health care and social services than government

institutions. Charities affiliated with religious institutions are already at the forefront of the control of intestinal parasites in a number of countries in Latin America and the Caribbean. Greater coordination between government and faith-based partners would provide significant success; for example, agreeing on a single, nationwide timetable for deworming each year would be a major step forward in avoiding duplication and reducing costs for everyone. As governments take advantage of these additional channels of distribution, it is critical to request standard coverage reporting from charitable institutions to ensure the creation and maintenance of consistent, non-duplicative data.

► **Coordinate and expand school-based deworming to reach at least 75 percent of enrolled students in both public and private institutions**

Evidence from around the world has established school-based mass treatment for intestinal parasites as one of the best

buys in global health. The low cost of the medication, plus the ease of its delivery, means that teachers can neatly play the role of administering an intervention that helps all of their pupils learn and perform better in the classroom. Several nations in the Americas have begun to use schools as a principal distribution channel for deworming medicine, but coverage rates in a number of countries remain quite low. Furthermore, statistics that show some affected areas are reaching the WHO minimum target of 75 percent coverage appear to suffer from the defect of double-counting. Governments, charities and other organizations that are involved in school-based campaigns to control intestinal worms need to coordinate better to reduce duplication of effort and rationalize the use of resources.

► **Include deworming as part of the health services offered by governments to conditional cash-transfer and food-benefit programs**

In the last decade, many nations in the hemisphere have begun schemes that provide income support, food baskets or vouchers, and education scholarships to families in poverty. Including yearly or twice-yearly deworming interventions to the package of health benefits offered/covered by governments to those enrolled in conditional cash-transfer programs (ideally as part of regular check-ups) would provide an additional incentive for parents in areas of risk to seek out health care. Eliminating the worms from the children enrolled in these programs also would make the benefits, especially schooling and nutrition, much more effective. If deworming programs are properly coordinated, the families in the conditional cash-transfer arrangements should face no additional cost for the anti-parasitics, nor should the government ministries that run the entitlements.

► **Include deworming as a part of school-feeding programs**

Serving nutritious meals at school is

universally recognized as an effective way to help children learn and grow better. Yet, when intestinal parasites are robbing the youngsters of many of the vitamins and minerals in each portion or when the worms cause so much pain, nausea or diarrhea that children cannot eat, the good of school feeding significantly diminishes. Those programs that provide breakfast and lunch to schoolchildren could schedule annual or biannual treatments for parasitic worms as an inexpensive way to safeguard the value of their much larger investments.

► **Integrate deworming with projects to improve water and sanitation**

Intestinal parasites will continue to plague communities as long as they do not have access to clean drinking water and adequate sanitation facilities. Governments throughout the Americas are building and renovating aqueducts, reservoirs, sewer systems and water-treatment plants, whether with their own funds or with loans and grants from international institutions. This wave of improvements offers a perfect opportunity for public utilities, municipal administrations and their private sector partners to build deworming components into water and sanitation projects, especially since controlling soil- and water-borne parasites will help to protect these large investments by preventing the recontamination of water resources in the target populations. Planners can further ensure the success of these improvements in water and sanitation by launching campaigns to improve personal and community hygiene, which will help reduce re-infection by intestinal parasites and keep drinking water and toilet facilities cleaner and safer.

► **Engage the pharmaceutical industry as a partner to increase the availability of low-cost, high-quality deworming medicines**

Pharmaceutical manufacturers, like Johnson & Johnson and GSK, are donating needed medications to

many deworming programs. These manufacturers are sensitive to demand for their products, and the prospect of large increases in the number of people treated in campaigns against intestinal parasites offers the opportunity to expand the production of albendazole and mebendazole. The governments of the most affected and poorest countries of the region could make a concerted and collective effort to attract interest in drug donation programs in the region, and explore with pharmaceutical companies that have deworming programs in Africa

how to expand their reach in Latin America and the Caribbean. To place deworming initiatives on a more sustainable footing over the long term, countries in the Americas that have existing, domestic pharmaceutical production capacity could work with local companies to boost their production of high-quality generic versions of the two drugs. The ministries of health of the hemisphere could access anti-parasitics available for procurement through the PAHO Strategic Fund to close any gaps not filled by direct donations.



Mobilize Political and Social Leadership

Political leadership and international partnerships can help reinforce success in deworming in individual countries by bringing greater public attention to the cause, attracting more interest from donors (both public and private) and helping to disseminate promising practices.

The following options could help generate hemisphere-wide financial and political support for deworming in the Americas:

► **Involve the First Ladies of the Americas as advocates and implementers of deworming**

Because of the emphasis all the First Ladies in the hemisphere place on the well-being of mothers and children, treating intestinal parasites is a natural theme for the group to adopt. A number of First Ladies serve as the chairs of quasi-public charities, and those institutions are excellent candidates to coordinate deworming activities in schools and community centers. Furthermore, future Conference of First Ladies, Spouses and Representatives of the Americas also presents an opportunity for advocacy in favor of campaigns to control parasitic worms throughout the Americas.

► **Call for investments in the trust fund for neglected tropical diseases**

With support from the Bill & Melinda Gates Foundation, the Global Network for Neglected Tropical Diseases, the IDB, PAHO and other experts, a Trust Fund to mobilize contributions targeted at specific projects to control intestinal parasites and other neglected tropical diseases is being finalized. The governments of the region could work together to solicit the private and public sector for financial contributions to enable the Trust Fund to support projects to control and eliminate intestinal worms in the region.

► **Create a coalition against intestinal parasites in the Americas**

Governments of the region could work with PAHO and key private sector partners to create a forum for collaboration on deworming that could exchange best practices, promote research, advocate

for attention and track progress against specific metrics. Such a partnership could harmonize control efforts against various neglected tropical diseases with other health initiatives to support integrated deworming efforts. Successful models for regional partnerships in health already exist, including the Stop TB Partnership, the Non-Communicable Disease Forum, the Onchocerciasis Elimination Program for the Americas (OEPA) and the Regional Program Review Groups for Lymphatic Filariasis (LF). For example, OEPA has encouraged positive competition and collaboration among the nations involved, fostered the transparent reporting of data according to agreed-upon criteria and channeled information on what strategies are working best against river blindness. Made up of representatives from the endemic countries, technical specialists and other key stakeholders, the Regional Program Review Groups for LF focus on the review of national action plans, drug-donation requests and technical collaboration between and among national and municipal program managers and their partners. This partnership has supported improved mass drug administration, monitoring and evaluation, morbidity management programs, and a collective strategy towards the elimination of LF in the region. A similar coalition would galvanize efforts to scale up deworming activities, integrated with other public health interventions, which could help governments and their collaborators produce impressive results against parasitic worms.



5

Conclusion

Conclusion

The vision of the Global Network for Neglected Tropical Diseases is a world free of neglected people and neglected diseases, including soil-transmitted helminths. We are committed to building bridges between governments, individuals, institutions and corporations to make this a global reality as we work to end the neglect. We believe no region of the world is better positioned to make major progress against NTDs, intestinal parasites in particular, than Latin America and the Caribbean. We urge international organizations, donors, humanitarian groups, the private sector and the governments of the Western Hemisphere to join together to implement the recommendations of this report and to launch an expanded campaign against intestinal worms now. Perhaps nothing else offers as much promise to help children stay in school to learn and prosper, improve the productivity of working people, and improve the health of mothers and their families.

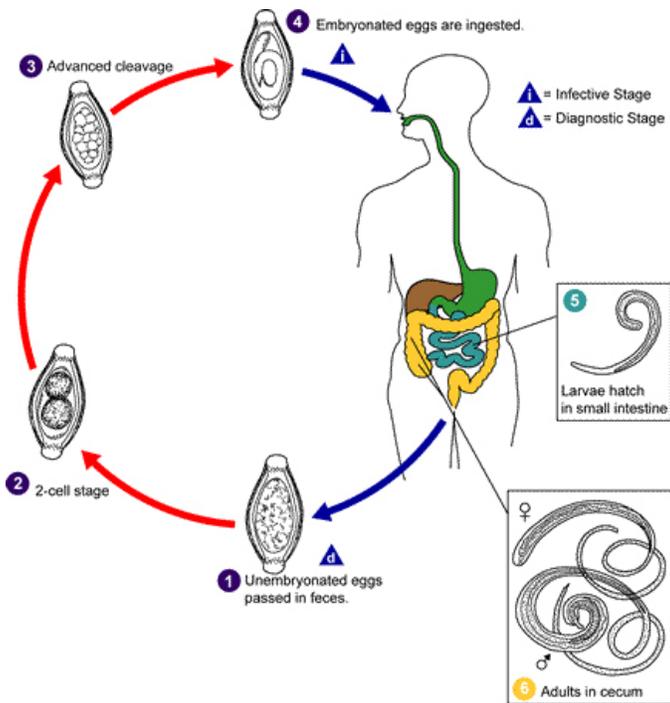
With concerted effort and good planning, the Americas have led the world in eliminating and controlling infectious and parasitic diseases. Latin America and the Caribbean was the first part of the globe to eradicate polio and to eliminate measles, and is now close to stamping out several of the most disfiguring neglected tropical diseases, including lymphatic filariasis and river blindness. Now is the time to extend that leadership to controlling parasitic intestinal worms, from which millions more suffer than from even HIV/AIDS or malaria. **Success stories in deworming abound; the key is to harvest these promising practices to integrate treatment for intestinal parasites with ongoing interventions in health, education, nutrition, water and sanitation, and income support.**

The intention of the Global Network in publishing this report, in partnership with IDB and PAHO, is to present specific recommendations to policy makers on how to scale up deworming. The first step in any expanded campaign against intestinal parasites is for each government in the region to call together its partners (donors, international agencies, humanitarian organizations, faith-based groups and the private sector) to craft an integrated National Action Plan. This process should involve updating national policies on treatment for parasitic worms, conducting surveys on the prevalence of soil-transmitted helminths, and setting out clear steps for implementation with timelines and budgets.

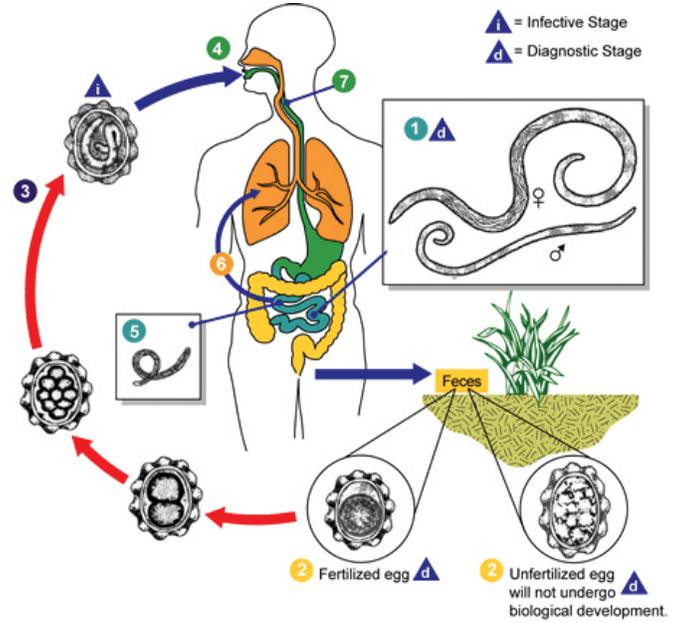
We look forward to the dialogue this report will generate, and to helping to make deworming a public health priority in Latin America and the Caribbean. **Furthermore, we look forward to a world free of neglected people and neglected tropical disease.**

Appendix

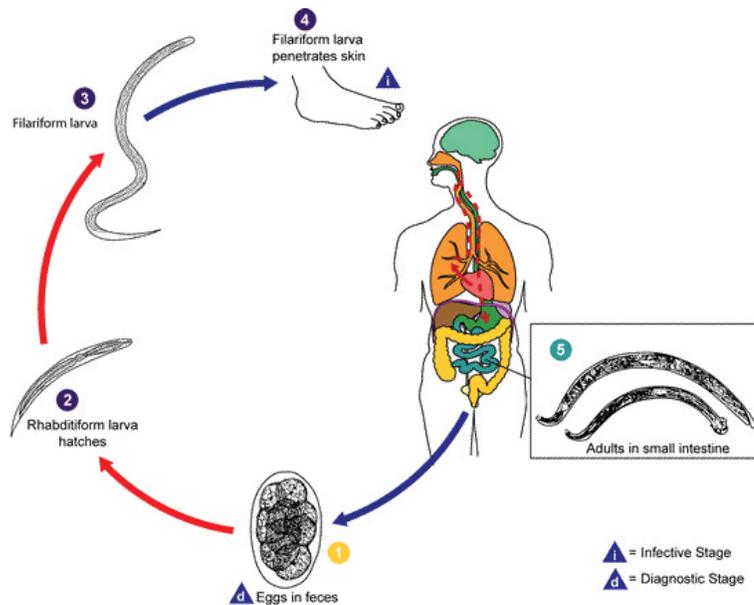
Whipworm Life Cycle



Roundworm Life Cycle



Hookworm Life Cycle



Endnotes

CHAPTER ONE

- 1 Final Report: Consultation Meeting on a Trust Fund for the Prevention, Control and Elimination of Neglected and Other Infectious Diseases in Latin America and the Caribbean (Washington, D.C., 15-16 December 2008), Pan American Health Organization, Washington, D.C., PAHO/HSD/CD/542-09, 2009, p. 36.
- 2 *Ibid.*, p. 29.
- 3 Final Report: Consultation Meeting on a Trust Fund for the Prevention, Control and Elimination of Neglected and Other Infectious Diseases in Latin America and the Caribbean (Washington, D.C., 15-16 December 2008), Pan American Health Organization, Washington, D.C., PAHO/HSD/CD/542-09, 2009, p. 35.
- 4 Final Report: Consultation Meeting on a Trust Fund for the Prevention, Control and Elimination of Neglected and Other Infectious Diseases in Latin America and the Caribbean (Washington, D.C., 15-16 December 2008), Pan American Health Organization, Washington, D.C., PAHO/HSD/CD/542-09, 2009, p. 78.
- 5 Final Report: Consultation Meeting on a Trust Fund for the Prevention, Control and Elimination of Neglected and Other Infectious Diseases in Latin America and the Caribbean (Washington, D.C., 15-16 December 2008), Pan American Health Organization, Washington, D.C., PAHO/HSD/CD/542-09, 2009, p. 21.
- 6 Epidemiological Profiles of Neglected Diseases and Other Infections Related to Poverty in Latin America and the Caribbean, Pan American Health Organization, Washington, D.C., 2009, p. 22.
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