



The Philippine Sustainable Sanitation Knowledge Series

# Guidebook for a Disease Prevention and Control Program for Soil-transmitted Helminth Infections and Diarrheal Diseases



Department of Health



The Philippine Sustainable Sanitation Knowledge Series

## **Guidebook for a Disease Prevention and Control Program for Soil-transmitted Helminth Infections and Diarrheal Diseases**

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- ***Guidebook for a Disease Prevention and Control Program for Soil-transmitted Helminth Infections and Diarrheal Diseases***
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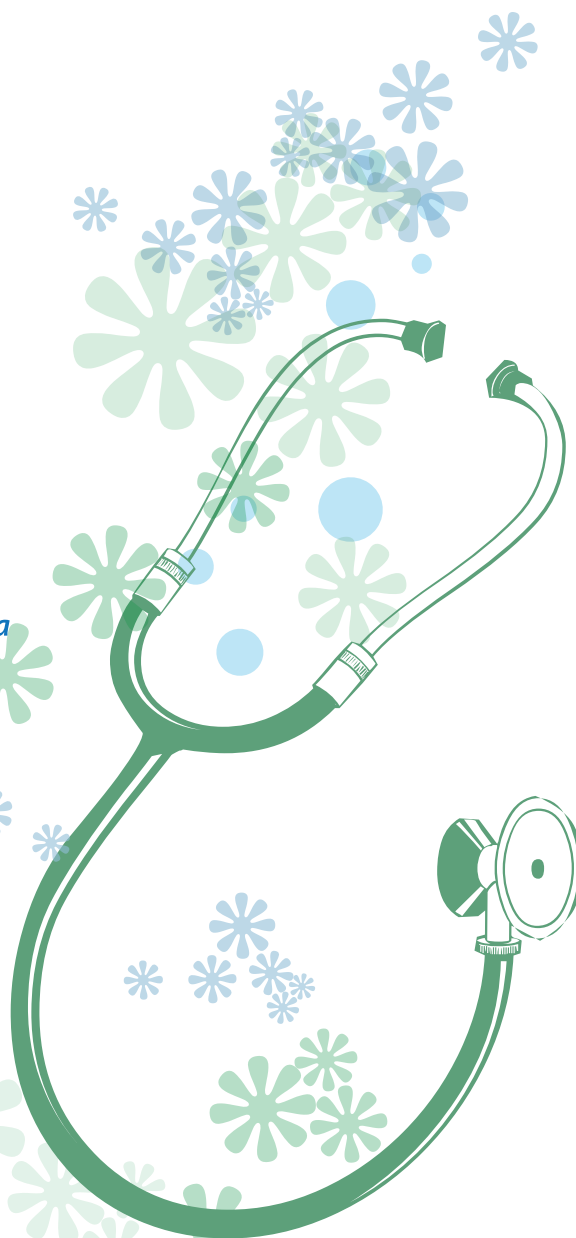
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## FOREWORD

This Guidebook describes the systematic approaches and strategies for the prevention and control of soil-transmitted helminth (STH) infections and diarrheal diseases in support of the Integrated Helminth Control Program and the Food and Waterborne Diseases Prevention and Control Program of the Department of Health. As a supplement to the Department of Health Integrated Helminth Control Program: mass treatment guide, conceptual framework, 2006-2010 strategic plan, this learning resource is expected to help enable health service providers and other stakeholders to make provisions for early diagnosis, treatment, prevention, and control of these diseases consistent with existing disease control programs. This Guidebook also describes surveillance and monitoring tools for baseline and continuing assessment using disease indicators at the community level. Results of surveillance and monitoring will be useful in the assessment of the effectiveness of control strategies in relation to set targets for control of these diseases.

According to 2008 UN data, 2.6 billion people still do not have access to or have inadequate sanitation facilities.

Every 20 seconds, a child dies as a result of poor sanitation. That's 1.5 million preventable deaths each year. In the Philippines, 23% of Filipinos or roughly 19 million still do not have access to sanitary toilets.

These realities necessitate tangible and concerted efforts that are owned by the people through the local government units (LGUs). The United Nations has already declared access to water and sanitation as a human right in its July 28, 2010 General Assembly. With the synergis-

tic efforts of both the public and private sectors, the Philippines is also making significant gains in raising awareness and accelerating progress towards the Millennium Development Goal (MDG) on sanitation: to reduce by half the proportion of people without access to basic sanitation by 2015.

Through this Guidebook, we also emphasize that the National Government needs the support of its partners in order to achieve this goal. We need greater collaboration with our partners in the local government units. Likewise, we need to intensify our partnership with the private sector.

Attaining sustainable sanitation is a significant challenge. However, we believe that we have committed partners in the LGUs. Sustainable sanitation will happen because the LGUs are recognizing their roles and equipping themselves with the appropriate knowledge, tools, and skills.

This Guidebook is just one in a series of knowledge resource materials that we are developing towards one of our shared aspirations: ensuring health and wellness for all Filipinos through clean, safe, and life-giving water and sanitation facilities. This Guidebook is for the LGUs and the Filipino people. Use it well and then share it with other LGUs who may also find it useful in their pursuit of sustainable sanitation.



**Enrique T. Ona, MD, FPCS, FACS**  
*Secretary Of Health*





## The SuSEA Program

The Sustainable Sanitation in East Asia Program-Philippine Component (SuSEA) supported by the Water and Sanitation Program (WSP) of the World Bank and the Swedish International Development Cooperation Agency (SIDA), and implemented through the leadership of the Departments of Health (DOH) and Environment and Natural Resources (DENR), is geared towards increasing access by poor Filipinos, primarily low-income households, to sustainable sanitation services by addressing key demand and supply constraints. Aside from this, the program hopes to learn from local implementation of sanitation programs as basis for national policy and operational guidance.

SuSEA Philippines commenced in July 23, 2007 as a learning program to support the Government of the Philippines (GoP) update its approaches and interventions in sanitation and needs that were not present or not addressed in traditional sanitation programs that focused on two extremes: 1) toilet-bowl distribution and hygiene education and 2) centralized sewerage systems. The most important of these emerging needs are:

- Complementing interventions related to the reduction of risks of sanitation- and poverty-related diseases such as soil transmitted helminthiasis and acute gastroenteritis
- Linking sanitation interventions with environmental objectives, such as the improvement of water quality and water resources
- Sanitation in rapidly urbanizing towns and cities, including the occurrence of disease episodes

that aggravate impacts of poor sanitation (such as flooding) on the economy and quality of life of city populations

- Reaching pockets of communities that comprise the remaining 20% of those without access to basic sanitation, particularly in the rural areas (among whom include indigenous peoples/cultural minorities) and urban slum communities.

SuSEA-Philippines was designed using four different models as the platform for developing specific interventions (according to themes below). The learning gained and the tools developed from these models served to assist other local governments units (LGUs), as well as informing national sanitation policy and programs for GoP-led expansion and scaling up. The four models are:

**Model 1** Disease Prevention and Control – Sanitation interventions for the eradication/ reduction of disease

**Model 2** Water Quality Management – Sanitation interventions for the improvement of water quality within a water quality management area

**Model 3** Liveable Cities – Sanitation interventions for the improvement of quality of life in cities and low-income urban poor communities

**Model 4** Sustainable Rural Livelihoods – Sanitation interventions to support sustained livelihoods in rural areas

Six sites participated in the main program sub-component of SuSEA. These are: Bauko Municipality in the Mt. Province, Dagupan City in Pangasinan Province, Guiuan Municipality in Eastern Samar Province, General Santos City and Polomolok



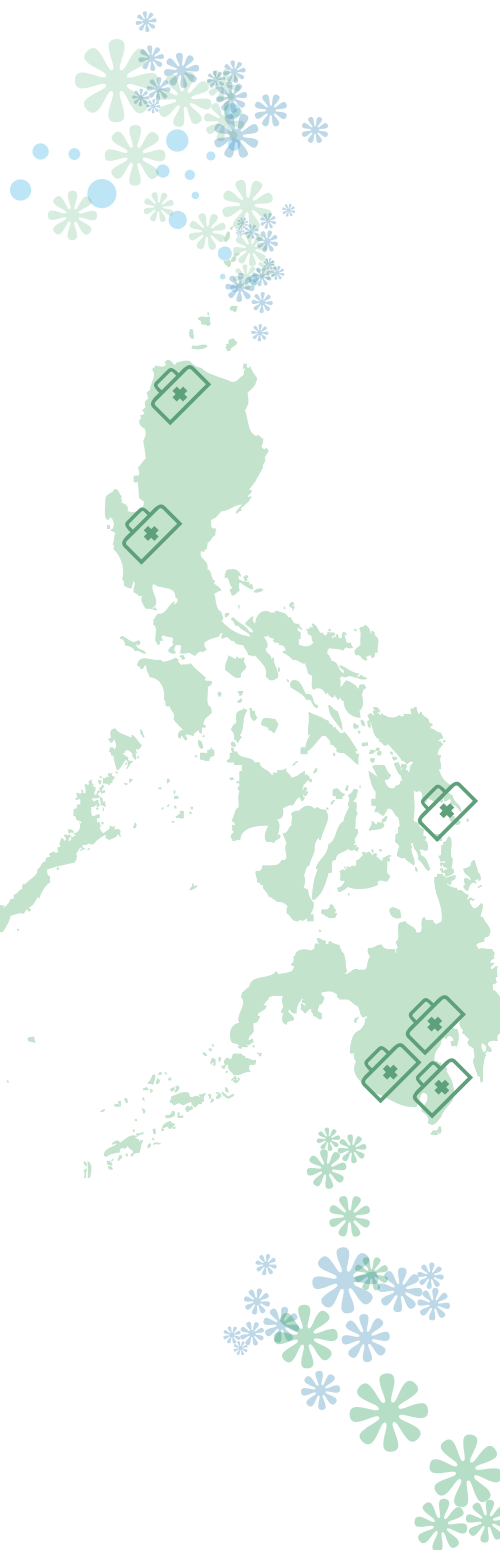
Municipality in South Cotabato, and Alabel Municipality in Sarangani Province. The desired outcome in each of the project sites varied according to the model and agreements by the Program Steering Committee and the local government.

While outcomes varied per site, each of the projects were additionally intended to provide the LGUs with a fount of information on developing and running their own sanitation programs based on the on-field experiences of the SuSEA team and their partners.

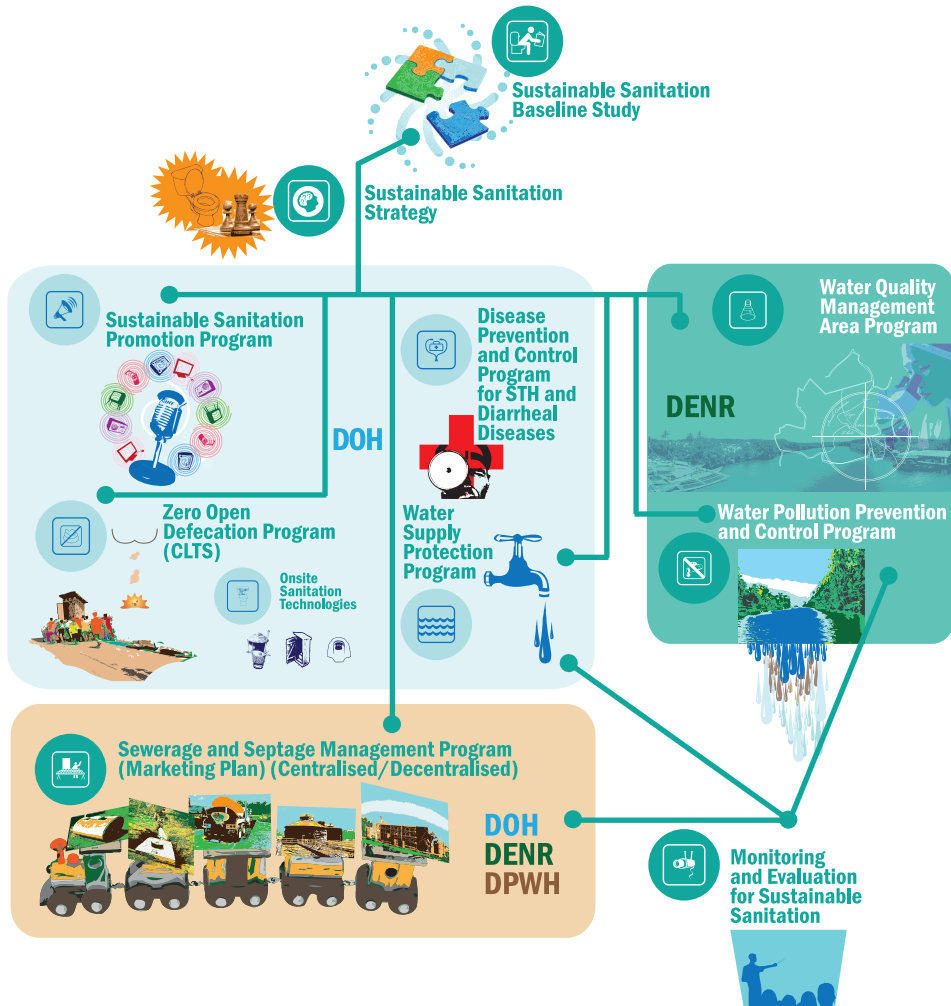
This information has been packaged for your use in a Sustainable Sanitation Knowledge Series, to which this guidebook/report belongs. The reader is encouraged to familiarize himself/herself with all the guidebooks/reports in this series beginning with the Guidebook for Conducting a Baseline Study and followed by the Guidebook for Developing a Local Sustainable Sanitation Strategy.

What guidebooks/reports you choose to utilize next will be determined by your community's particular needs and your LGU's proposed sanitation programs.

On the succeeding page, you will find an illustration of the various sustainable sanitation programs (SSPs) under the National Sustainable Sanitation Plan (NSSP). For each of these SSPs, SuSEA has also developed materials under the Philippine Sustainable Sanitation Knowledge Series, intended to guide local government units in implementing the various sanitation programs and initiatives in their own area. The information gathered in the Knowledge Series is, in turn, based on specific SuSEA projects and activities in each of the six project sites.



## Sustainable Sanitation Programs



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## ACRONYMS AND ABBREVIATIONS

<b>AE</b>	<i>Adverse event</i>
<b>ADR</b>	<i>Adverse drug reaction</i>
<b>AGE</b>	<i>Acute gastroenteritis</i>
<b>ALS</b>	<i>Alternative Learning System</i>
<b>AO</b>	<i>Administrative Order</i>
<b>BHS</b>	<i>Barangay Health Station</i>
<b>BHW</b>	<i>Barangay health worker</i>
<b>CESU</b>	<i>City Epidemiology and Surveillance Unit</i>
<b>CHD</b>	<i>Center for Health Development</i>
<b>CHO</b>	<i>City Health Office</i>
<b>CLTS</b>	<i>Community-led Total Sanitation</i>
<b>DALYs</b>	<i>Disability-adjusted life years</i>
<b>DEC</b>	<i>Diethylcarbamazine</i>
<b>DepEd</b>	<i>Department of Education</i>
<b>DFS</b>	<i>Direct fecal smear</i>
<b>DOH</b>	<i>Department of Health</i>
<b>DPCP</b>	<i>Disease Prevention and Control Program</i>
<b>DRA</b>	<i>Disease Reporting Advocate</i>
<b>DRU</b>	<i>Disease Reporting Unit</i>
<b>DSC</b>	<i>Disease Surveillance Coordinator</i>
<b>DSO</b>	<i>Disease Surveillance Officer</i>
<b>DSWD</b>	<i>Department of Social Welfare and Development</i>
<b>GP</b>	<i>Garantisadong Pambata</i>
<b>EHCP</b>	<i>Essential Health Care Package</i>
<b>EPI</b>	<i>Expanded Program on Immunization</i>
<b>ESU</b>	<i>Epidemiology and Surveillance Unit</i>
<b>FECT</b>	<i>Formalin ether/ethyl acetate concentration technique</i>
<b>FETP</b>	<i>Field Epidemiology Training Program</i>
<b>FHSIS</b>	<i>Field Health Service Information System</i>
<b>FWBDPCP</b>	<i>Food and Waterborne Diseases Prevention and Control Program</i>
<b>HEPO</b>	<i>Health Education and Promotion Officer</i>
<b>HIS</b>	<i>Health Intelligence Service</i>
<b>IEC</b>	<i>Information, education, and communication</i>
<b>IHCP</b>	<i>Integrated Helminth Control Program</i>



## ACRONYMS AND ABBREVIATIONS

<i>IP</i>	<i>Indigenous Peoples</i>
<i>LF</i>	<i>Lymphatic filariasis</i>
<i>LGU</i>	<i>Local government unit</i>
<i>MESU</i>	<i>Municipal Epidemiology and Surveillance Unit</i>
<i>MCHS</i>	<i>Maternal and Child Health Service</i>
<i>MDA</i>	<i>Mass drug administration</i>
<i>MO</i>	<i>Medical Officer</i>
<i>MPS</i>	<i>Mean percentage score</i>
<i>NAT</i>	<i>National Achievement Test</i>
<i>NCDPC</i>	<i>National Center for Disease Prevention and Control</i>
<i>NEC</i>	<i>National Epidemiology Center</i>
<i>NGO</i>	<i>Non-government organization</i>
<i>NSSP</i>	<i>National Sustainable Sanitation Plan</i>
<i>ORS</i>	<i>Oral rehydration salts</i>
<i>OSY</i>	<i>Out-of-school youth</i>
<i>PESU</i>	<i>Provincial Epidemiology and Surveillance Unit</i>
<i>PIDSR</i>	<i>Philippine Integrated Disease Surveillance and Response</i>
<i>PHN</i>	<i>Public Health Nurse</i>
<i>PHO</i>	<i>Provincial Health Office</i>
<i>PTA</i>	<i>Parent Teacher Association</i>
<i>RESU</i>	<i>Regional Epidemiology and Surveillance Unit</i>
<i>RHM</i>	<i>Rural Health Midwife</i>
<i>RHU</i>	<i>Rural Health Unit</i>
<i>SI</i>	<i>Sanitary Inspector</i>
<i>SIDA</i>	<i>Swedish International Development Cooperation Agency</i>
<i>STH</i>	<i>Soil-transmitted helminth</i>
<i>SuSEA</i>	<i>Sustainable Sanitation in East Asia Philippines</i>
<i>UNICEF</i>	<i>United Nations Children's Fund</i>
<i>UPM-CPH</i>	<i>University of the Philippines Manila - College of Public Health</i>
<i>UPM-NIH</i>	<i>University of the Philippines Manila - National Institutes of Health</i>
<i>WHO</i>	<i>World Health Organization</i>
<i>WOW</i>	<i>War on Worms</i>
<i>WB-WSP</i>	<i>World Bank - Water and Sanitation Program</i>
<i>ZODP</i>	<i>Zero Open Defecation Program</i>

## INTRODUCTION

Soil-transmitted helminth (STH) infections and diarrheal diseases remain as major public health concerns in developing countries like the Philippines, where poverty, poor environmental hygiene, and impoverished health services exist (WHO, 1998). Open defecation outside latrines by infected persons contributes significantly to the transmission of the diseases via contamination of soil and water supply. Infected feces left in the open are exposed to mechanical vectors such as flies (Getachew et al., 2007; Monzon et al., 1991).

The burden brought about by STH infections and diarrheal diseases contributes to the vicious cycle of poverty and disease (Schaible and Kauffmann, 2007). The disease burden is based on disability-adjusted life years (DALYs) or the years lost to premature mortality and disability. Recent estimates of disease burden of STH infections and diarrheal diseases amounted to 39 million DALYs (Hotez et al., 2009) and 62 million DALYs

watery diarrhea amounted to US\$ 517 million or 51% of the total health care cost in 2008 (World Bank, 2008).

STH infections are caused by *Ascaris lumbricoides*, *Trichuris trichiura*, and the hookworms *Necator americanus* and *Ancylostoma duodenale*. High risk groups for STH infections include children, adolescent females, pregnant women, and other occupational groups such as farmers, soldiers, and indigenous peoples (DOH, 2006). Helminth infections often result in subtle morbidities such as anemia, impaired physical and cognitive development, as well as poor school performance in children (Hall et al., 2008; Bethony et al., 2006). High intensity STH infections may also result in clinical complications (Table 1). The World Health Assembly Resolution 54.19 (2001) urges member countries to reduce STH infections through school-based mass drug administration (MDA) among school-age children.

The Integrated Helminth Control Program (IHCP) of the Department of

**Table 1.** Clinical syndromes and complications of STH infections

Parasite	Specific and syndromes complications		General features
	Larval migration	Gastrointestinal parasitism	
<i>Ascaris lumbricoides</i>	Pneumonitis	Lactose intolerance Vitamin A malabsorption Intestinal obstruction Acute appendicitis Hepatobiliary and pancreatic complications	Impaired physical growth Impaired cognitive growth Poor school performance
<i>Trichuris trichiura</i>	None	Colitis Trichuris dysentery syndrome Rectal prolapsed	
Hookworm	Ground itch Cough and pneumonitis	Intestinal blood loss Iron-deficiency anemia Protein malnutrition	

(Source: Bethony et al., 2006)

(Mathers et al., 2007), respectively. Furthermore, the World Bank - Water and Sanitation Program (WB-WSP) estimated the economic losses to diarrheal diseases at US\$ 671.8 million. The losses to acute

Health (DOH) aims to reduce the prevalence rates of STH infections among children, adolescent females, pregnant women, and other special occupational groups. The IHCP proposes the school-based strategy for MDA in children ages







six to 12 years, and the community-based approach for the MDA in children ages 12 to 71 months old, as well as in individuals two to 65 years of age for lymphatic filariasis (LF) elimination in endemic areas. The IHCP also gives emphasis on improvements in the provision of safe water, sanitation, hygiene (WASH), and health education for the prevention and control of intestinal helminthiasis (DOH, 2006a).

Infectious diarrheal diseases are caused by viruses, bacteria, and protozoa. The mode of transmission is commonly through the fecal-oral route by consumption of contaminated food or water (Pruss et al., 2002). Viruses remain as the cause of most diarrheal diseases. Viral diarrhea is most commonly caused by rotavirus, which is responsible for 15-25% of episodes of watery diarrhea in children less than two years of age (WHO, 2005).

Diarrhea-causing bacteria include *Escherichia coli*, *Shigella spp.*, *Vibrio cholerae*, *Campylobacter jejuni* and *Salmonella spp.* Pathogenic groups of *E. coli* cause up to 25% of diarrheal diseases in developing countries. *Shigella* causes 10-15% of acute diarrhea in children below five years of age, and is the most common cause of bloody diarrhea in this age group. *V. cholerae* O1 and O139 cause severe watery diarrhea among older children and adults. Other bacterial organisms that cause diarrhea are *C. jejuni*, which causes 5-15% of diarrhea in infants, and *Salmonella*, which causes 1-5% of gastroenteritis in developing countries (WHO, 2005).

Diarrhea-causing protozoa include *Giardia spp.*, *Entamoeba histolytica* and *Cryptosporidium spp.* Infections with

*Giardia* and *E. histolytica* are usually asymptomatic. Giardiasis rarely causes persistent diarrhea, and amoebiasis is an unusual cause of bloody diarrhea. *Cryptosporidium* causes watery diarrhea in immunocompromised patients (WHO, 2005).

Acute watery diarrhea is usually self-limited, but the increased loss of water and electrolytes during diarrhea may cause severe dehydration and electrolyte imbalance leading to mortality, especially among young children (Black et al., 2003). Diarrhea could also cause malnutrition, which is an important cause of mortality in bloody and persistent diarrhea (WHO, 2005).

According to the World Health Organization (WHO), the essential elements in the treatment of children with diarrhea are the provision of oral rehydration therapy, zinc supplement administration, continued feeding, and proper use of antibiotics. Prevention of diarrheal diseases involves safe water, sanitation, hygienic behavior, education, breastfeeding, and measles immunization (WHO, 2005).

The Food and Waterborne Diseases Prevention and Control Program (FWBDPCP) of the DOH aims to reduce the incidence of diarrheal diseases through the implementation of treatment guidelines for diarrheal diseases at the community level (DOH, 2007), surveillance and monitoring of epidemic-prone diarrheal diseases such as cholera and acute bloody diarrhea (DOH, 2008), together with health education and information dissemination (DOH, 1997).

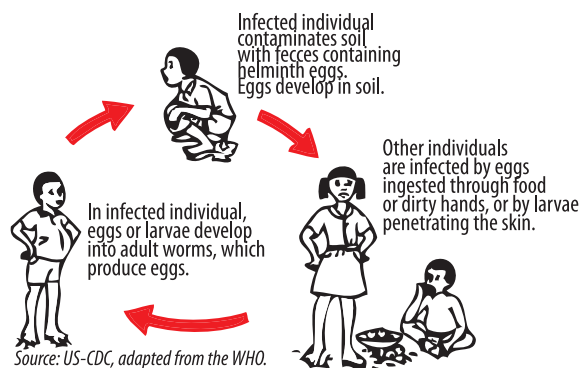


## SOIL-TRANSMITTED HELMINTH INFECTIONS

### Epidemiology

Approximately two billion people are infected with soil-transmitted helminths. It is estimated that 807 million individuals are infected with *Ascaris*, 604 million with *Trichuris*, and 576 million with hookworms (Bethony et al., 2006).

The burden caused by STH infections remains high in the Philippines according to results of studies supported by the DOH and the United Nations Children's Fund (UNICEF). Baseline cumulative prevalence of STH infections among preschool-age children in sentinel sites was 66.0% in 2004 (de Leon and Lumampao, 2004). In the follow-up monitoring in the IHCP sentinel sites in 2009, the cumulative prevalence of STH infections among



**Table 2.** Thresholds for the classification of intensity of STH infections in individuals

Parasite	Light intensity eggs per gram	Moderate intensity eggs per gram	Heavy intensity eggs per gram
<i>A. lumbricoides</i>	1-4,999	5,000-49,999	≥50,000
<i>T. trichiura</i>	1- 999	1,000- 9,999	≥10,000
Hookworm	1-1,999	2,000- 3,999	≥ 4,000

(Source: WHO, 1998)

pre-school age children 12 to 71 months old was 43.7% and the prevalence of heavy intensity infections was 22.4% (Belizario et al., 2010). In the school-age group, a baseline study done among public elementary school children in the sentinel sites of the IHCP in 2007 revealed a cumulative prevalence and prevalence of heavy intensity infections of 54.0% and 23.1%, respectively (Belizario et al., 2009). In the follow-up parasitologic survey, 44.7% of school-age children had STH infections, and 19.7% had heavy intensity infections (Belizario et al., 2010).

A DOH and WHO-supported parasitologic survey done among school-age children in indigenous peoples (IP) communities showed a cumulative prevalence of STH infections of 38.6%, and prevalence of heavy intensity infection was 7.8% (Belizario et al., 2010). As part of the Sustainable Sanitation in East Asia Philippines (SuSEA) Program, a parasitologic survey was done among school-age children in the SuSEA sites of Dagupan City and the municipality of Guiuan, Samar in 2007. The cumulative prevalence rates in Dagupan City and Guiuan were 48.0% and 83.1%, respec-

### Diagnosis

Parasitologic diagnosis of STH infections is made by analyzing stool samples for the presence of eggs. The direct fecal smear (DFS) alone is the routine method of stool examination for the detection of motile protozoan trophozoites in diarrheic stool. The DFS and Kato Thick method together are recommended for use in routine stool examination for STH infections and other helminths as well as for protozoan cysts. The Kato Katz method is primarily used for surveillance and monitoring of STH infections as well as other intestinal helminthiasis, and makes use of egg counts expressed in number of eggs per gram, as shown in Table 2. This is preferably done with quality control procedures (WHO, 1998). The formalin ether/ethyl acetate concentration technique (FECT) is the procedure of choice for the screening of food handlers (DOH, 2006b).

### Treatment

The treatments of choice for STH infections are the benzimidazoles.

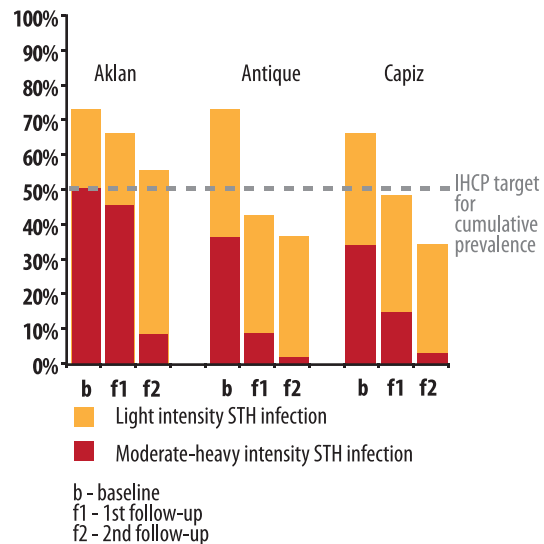


Albendazole and mebendazole are broad spectrum anthelmintics proven to be highly efficacious for treating STH infections (Keiser and Utzinger, 2008). Reductions in worm burden have an important impact on the health of children, including improvements in food intake (Stoltzfus et al., 2004), iron stores, and hemoglobin levels (Pandey et al., 2005; Stoltzfus et al., 2004), vitamin A levels (Tanumihardo et al., 2004; Jalal et al., 1998), growth (Awasthi et al., 2008; Hall et al., 2008).

The adverse events (AEs) associated with albendazole and mebendazole are mostly mild and transient. The most commonly reported AEs associated with benzimidazole administration include mild abdominal pain, diarrhea, headaches, dizziness, local hypersensitivity and erratic worm migration. No treatment is necessary in majority of cases with AEs (Montessor et al., 2003; Horton, 2000; Albonico et al., 1995). Antihistamine is indicated for local hypersensitivity reactions, and there is no scientific basis for its use together with routine deworming. Oral hydration therapy can be started for diarrhea (WHO, 2006).

Albendazole or mebendazole can be safely administered with vitamin A (WHO, 2004). Albendazole and diethyl-carbamazine (DEC) can be safely administered to children two years of age and above. Praziquantel and benzimidazoles can be safely administered together (WHO, 2006a).

The AEs experienced by individuals co-administered with the albendazole, DEC, and praziquantel have been described as mild and self-limiting events. Data from a large population under study in Zanzibar suggested that co-administration of the three drugs is a safe intervention when carried out in an area where LF, STH, and schistosomiasis are co-endemic, and where several rounds of treatment with one or two drugs have been implemented in the past (Mohammed et al., 2008). It is necessary to emphasize the need for maintaining passive surveillance measures when administering similar interventions. Detection, management, and reporting of potential AEs are key components of any health intervention administering drugs (Dodoo et al., 2007).



**Figure 1.** Cumulative STH prevalence and heavy intensity infections in school-age children in Aklan, Antique, and Capiz, 2007 to 2009 (Belizario et al., 2010)

## Prevention and Control

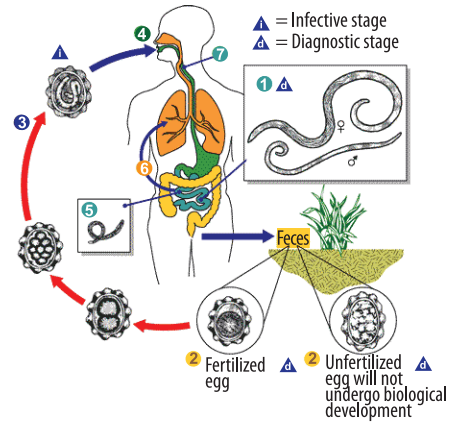
The objective of a helminth control program is morbidity reduction among endemic populations by reduction of the number of heavily infected individuals (WHO, 2006).

Preventive chemotherapy is the main strategy used in a helminth control program. Preventive chemotherapy refers to administration of drugs, either alone or in combination, to an entire group of people without prior diagnosis of current infection as a public health tool against helminth infections. Preventive chemotherapy through periodic MDA is considered a rapid first-line intervention in morbidity reduction and control of STH infections (WHO, 2006a; WHO, 2002). Infective eggs remain viable in the soil for a maximum of two years, thus, MDA for at least three consecutive years should be done (WHO, 2002).

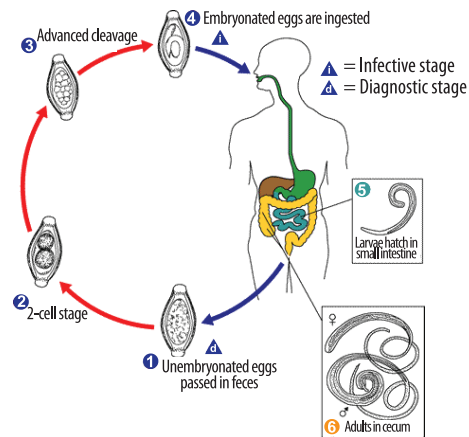
MDA among target populations may be infrastructure-based or community-based. School-based, teacher-assisted MDA is the recommended control



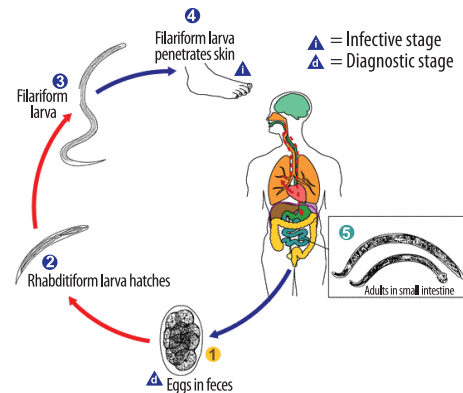
Data regarding prevalence and intensity of parasitic infections are important indicators of the impact of intervention.



**Figure 2.** The life cycle of *Ascaris* ([www.cdc.gov](http://www.cdc.gov))



**Figure 3.** The life cycle of *Trichuris* ([www.cdc.gov](http://www.cdc.gov))



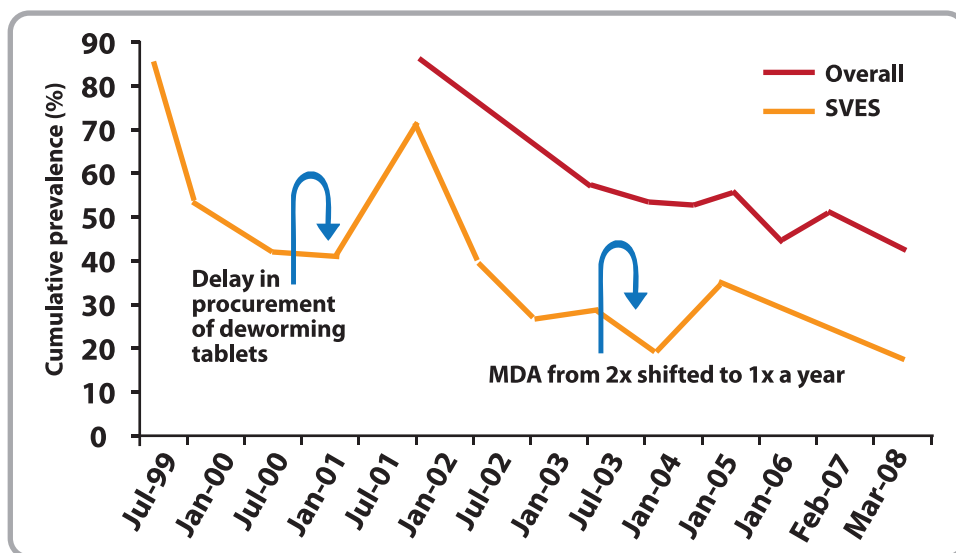
**Figure 4.** *The life cycle of hookworm (www.cdc.gov)*

These parameters determine the classification of communities and the appropriate treatment strategy as recommended by the WHO (Table 4). For cumulative prevalence above 50%, MDA in target population groups should be done. If the cumulative



prevalence becomes less than 50% and there are major improvements in sanitation and hygiene, MDA can be done once a year (WHO, 2006), although reinfection rates can be high as seen in Figure 5.

The national program also aims to increase the proportion of households aware of proper STH prevention and control, with 75% of mothers/caregivers practicing appropriate personal and food hygiene (DOH, 2006a).



**Figure 5.** Comparison of cumulative prevalence in SVES (pilot school) and sentinel schools in Biñan, Laguna from 1999 to 2010 (Belizario et al. 2006; Belizario, unpublished)

The objectives of the IHCP include reducing the prevalence of STH infections in children one to 12 years of age to less than 50%, and in other high risk population groups, including adolescent females, pregnant women, farmers, and soldiers (DOH, 2006a). To achieve the goal of the program, the IHCP aims to achieve at least 85% treatment coverage among all populations at risk (DOH, 2006b). For access to safe water and sanitary toilets, the IHCP aims for 94% and 80% coverage rates, respectively.

According to the National Sustainable Sanitation Plan (NSSP), the prevalence of STH infections should be reduced by 60% in 2016 and be near zero by 2022 (DOH, 2010). Sentinel surveillance data in 2009 for pre-school and school age children may provide baseline data.

MDA among children 12 to 71 months old is being done by trained barangay health workers (BHWs) and day care workers during the Garantisadong Pambata (GP) activities, together with provisions of

**Table 4.** Categories for community diagnosis and selection of control measures for STH infections

Community category	Prevalence of STH infections among schoolchildren	Action to be taken	
High-risk	> 50%	Mass treatment for all school-age children <sup>a</sup> twice a year <sup>b</sup>	Also treat: Preschool children Women of childbearing age Pregnant women in 2nd and 3rd trimester Adults with occupational risks
Low-risk	20c – 49%	Mass treatment for all school-age children once each year <sup>a</sup>	Also treat: Preschool children Women of childbearing age Pregnant women in 2nd and 3rd trimester

<sup>a</sup>Includes both enrolled and non-enrolled children six to 12 years of age

<sup>b</sup>Mass treatment can be conducted thrice a year or every four months.

<sup>c</sup>If STH prevalence rates are below 20% and there are adequate improvements in sanitation, selective treatment may be considered.

(Sources: DOH, 2006a; WHO, 2006)



vitamin A supplements and other micronutrients (DOH, 2006a). Children six to 12 years of age enrolled in elementary schools may be given anthelmintics by trained school teachers under the supervision of the trained school nurses, while MDA among the non-enrolled school-age children may be done by trained BHWs. MDA with albendazole with diethylcarbamazine is being done for individuals 2 to 65 years of age in filariasis-endemic areas (DOH, 2006a). The schedules of MDA among the target population groups are in Table 5.

MDA and selective treatment. A second dose should be provided for pregnant women who come from areas with prevalence rates of hookworm infections above 50% (DOH, 2006a).

For persistent or severe AEs, there is a need to refer a physician and inform the IHCP regional or provincial coordinator (DOH, 2006a).

The administration of albendazole and mebendazole is contraindicated during the first trimester of pregnancy and in children less than one year old. Benzimidazole

**Table 5.** Target populations and schedules of MDA for STH infections

Targets	Schedule	Responsible agency
Children 12-71 months old <sup>a</sup>	April and October	DOH/LGU
Children 6-12 years old <sup>b</sup>	July and January	DOH/DepEd
Individuals 2-65 years old in LF endemic areas <sup>a</sup>	November	DOH/LGU

<sup>a</sup>Community-based mass treatment

<sup>b</sup>School-based mass treatment

(Source: DOH, 2006a)

MDA among adolescent females and other special population groups will be done by the local health unit staff once a year any time members of the above groups consult the health facility. MDA among pregnant women will also be done by the local health unit staff during prenatal visits, particularly during the second or third trimester (DOH, 2006a).

Table 6 contains the drugs and their respective doses and regimens for

zole administration is also contraindicated in children with severe malnutrition, high-grade fever, profuse diarrhea, or abdominal pain (DOH, 2006a).

Master listing is recommended before an MDA activity. Trained BHWs may be mobilized to complete a master list of pregnant women, female adolescents, and children age one to 12 years who are not enrolled in schools. Pre-elementary and elementary teachers, as well as day care workers, can easily prepare a list of all enrollees (DOH, 2006c) that is usually

**Table 6.** Target populations and drug regimens of MDA for STH infections

Target group	Drug dosage (single dose)	Frequency and duration
12-24 months of age	Albendazole 200 mg or Mebendazole 500 mg	MDA every six months for three years
24 months of age and above	Albendazole 400 mg or Mebendazole 500 mg	MDA every six months for three years
Individuals 2-65 years old in LF-endemic areas	Albendazole Diethylcarbamazine	MDA once a year
Adolescent females	Albendazole 400 mg or Mebendazole 500 mg	Once a year any time they consult the health facility
Pregnant women second and third trimester	Albendazole 400 mg or Mebendazole 500 mg	Once a year any time they consult the health facility
Special population groups	Albendazole 400 mg or Mebendazole 500 mg	Once a year any time they consult the health facility



<sup>a</sup>It is recommended that MDA should be continued until there are major improvements in sanitation and hygiene.

<sup>b</sup>Contraindicated in the severely ill, pregnant women, and children below two years of age (WHO, 2006)

<sup>c</sup>Pregnant women from areas with > 50% prevalence rates of hookworm infections are treated twice a year.

(Source: DOH, 2006<sup>a</sup>)

available as a class list.

The formula for drug requirements for mass and selective treatment of different target populations is stated below:

**(Number of tablets for desired coverage in target population<sup>a</sup>) + (number of tablets for additional wastage in target population<sup>b</sup>) = number of deworming drugs required<sup>c</sup>**

<sup>a</sup> The desired treatment coverage rates for all population groups is 85% (DOH, 2006c).

Computation for children age one to 12 years: (total population x 30%) x 85% (DOH, 2006c)

Computation for adolescent females: (total population x 18%) x 85% (DOH, 2006c)

Computation for pregnant women: (total population x 3.5%) x 85% (DOH, 2006c)

<sup>b</sup> Computation for wastage: 5% x number of tablets for desired coverage in target population (DOH, 2006c)

<sup>c</sup> Since MDA is done twice a year among children one to 12 years of age, the computed number of tablets required is multiplied by two. Since pregnant women who come from areas highly endemic for hookworms are also treated twice a year, the computed number of tablets required for this population group is multiplied by two (DOH, 2006c).

The DOH shall deliver the anthelmintics for MDA to the regional health offices or Centers for Health Development (CHD). From the CHDs, the drugs will be distributed to respective local government units (LGUs) and Department of Education (DepEd) division offices (DOH, 2006c).

## Surveillance and Monitoring

Indicators are essential for program planning and monitoring of large scale interventions for the control of helminth infections. Among the proposed indicators by the WHO (2002b), parasitologic indicators and treatment coverage rates in the target populations are the most important in monitoring and evaluation of helminth control programs (WHO, 2006). Morbidity indicators such as nutritional status data and data on school performance could also be noted to allow a better understanding of the effects of STH infections (WHO, 1998).

Parasitologic indicators are most essential in assessing the impact of interventions on morbidity reduction. The overall prevalence rate of STH infections will determine the appropriate interventions for communities (WHO, 2006).

The WHO recommends that control programs for STH infections begin with a baseline parasitologic survey (WHO, 1996). A baseline survey provides a basis for estimating the status and the need for intervention in a population, and produce essential data to guide the development of control programs (WHO, 1998).

Parasitologic monitoring is done just before a drug administration cycle. This will allow the assessment of maximal re-infection rates and the estimation of the prevalence of heavy intensity infections. These parameters will provide information for planning the type and frequency of future interventions (WHO, 2002b).

Elementary school pupils are the ideal targets for a parasitologic survey because they harbor the greatest worm burden among all age groups. Moreover, the enrolled school-age children are accessible in schools (WHO, 1998).

To evaluate the prevalence and intensity of STH infections in a division or district, a sample size of 250 students or 50 students from five schools is considered adequate (WHO, 1994). Grade three students are likely to have received at least two years of interventions and are ideal for monitoring purposes (WHO, 2002b). Follow-up surveys monitor the impact of a control program, and are ideally done every two or three years just before a round of MDA (WHO, 1998).

Reporting of the parasitologic data in school surveys should be presented according to grade level, school, district, and division (WHO, 1994). Reporting of the parasitologic data of STH infections should include cumulative prevalence and overall prevalence of heavy intensity STH infections, as well as prevalence and proportions of heavy intensity infections per helminth species. The prevalence rates of multiple infections should also be reported (WHO, 2006a).

The laboratory technique and proficiency of the laboratory staff are major determinants of reliable laboratory diagnosis of STH infections and other intestinal helminthiasis. Quality assurance of the laboratory techniques should be maintained through proper collection of specimens, availability of fresh reagents, use of appropriate laboratory technique, meticulous examination of processed specimens, and accurate reporting of findings. Quality control involves a



reference microscopist who will provide assistance in the verification of positive findings and will blindly re-examine 10% of all slides (WHO, 1998).

The treatment coverage is the minimum indicator to assess the performance of large-scale MDA. The treatment coverage refers to the proportion of people in the target population who have actually swallowed the recommended drug (WHO, 2006a).

The treatment coverage for the school-based MDA should be reported as summaries according to class, grade level, school, and district. The reports should be accomplished by the teachers and public health nurses (PHNs) for submission to the DepEd Division Medical Officer (MO). From the MO, a summary report should be forwarded to the CHD and then to the National Center for Disease Prevention and Control (NCDPC) of the DOH Central Office (DOH, 2006c).

The report on treatment coverage in the GP and MDA for LF will be accomplished by BHWs and midwives, and will be submitted to the City Health Office (CHO)/Rural Health Unit (RHU). For chartered cities, the report from the CHO will be forwarded to the CHD. For municipalities, the report from the RHU should be sent to Provincial Health Office (PHO) and then to the CHD. Reports from the CHD should be submitted to the DOH-NCDPC (DOH, 2006c).

The accomplishment report on treatment of adolescent females, pregnant women, and special population groups such as farmers, soldiers, food handlers, and individuals belonging to IP groups must be recorded and reported by the responsible health facilities to the CHO/RHU. Treatment of children in health facilities must also be recorded and reported accordingly (DOH, 2006c).

Reports of AEs must be submitted together with the accomplishment report for the treatment round. Accomplishment reports must be submitted not later than one week after the treatment round (DOH, 2006c).

Table 7 contains the core indicators and their formulas, targets, frequency, as well as timing.

Monitoring of school performance may be done using the results of the National Achievement Test (NAT). Indicators for school performance may include the proportion of pupils with NAT mean percentage scores (MPS) below 75%. Data on the NAT scores could be requested from the concerned division and district offices of the DepEd.

Nutritional status indicators among children may include the proportions of below height- and weight-for-age, as well as the prevalence of anemia. Data on the height- and weight-for-age could be requested from the concerned division and district offices of the DepEd.

**Table 7.** Core indicators of MDA for STH infections

Indicator	Calculation (x 100%)	Target	Frequency
Treatment coverage	Numerator: Population treated Denominator: Total population	85% among children one to 12 years of age, adolescent females, pregnant women, and treatment of other special population groups	In every round of treatment administration
Parasitologic evaluation	<p><i>Cumulative prevalence of STH infections in a population group</i> Numerator: # of individuals positive for any STH infection Denominator: # of individuals examined</p> <p><i>Heavy intensity* infection rate of STH infections in a population group</i> Numerator: # of individuals with moderate to heavy intensity STH infection Denominator: # of individuals examined</p> <p><i>Prevalence rates per STH species in a population group</i> Numerator: # of individuals positive for a specific STH infection Denominator: # of individuals examined</p> <p><i>Proportion of heavy intensity* infection per STH species in a population group</i> Numerator: # of individuals with moderate to heavy intensity Ascaris/Trichuris/hookworm infection Denominator: # of individuals positive for Ascaris/Trichuris/hookworm</p>	<p>Cumulative prevalence of STH infections: &lt; 50%</p> <p>Heavy intensity infection rates of STH infections: 0%</p>	<p>Before the start of MDA and before a next round of MDA in intervals of two or three years</p>

\* Thresholds of heavy intensity infections are in Table 2.  
(Sources: DOH, 2006a; WHO, 2006)



## DIARRHEAL DISEASES

### Epidemiology

Diarrheal diseases are a leading cause of childhood morbidity and mortality in developing countries. An estimated 1.87 million children below five years of age died from diarrhea in 2003. On the average, children below three years of age experience three episodes of diarrhea annually (WHO, 2005).

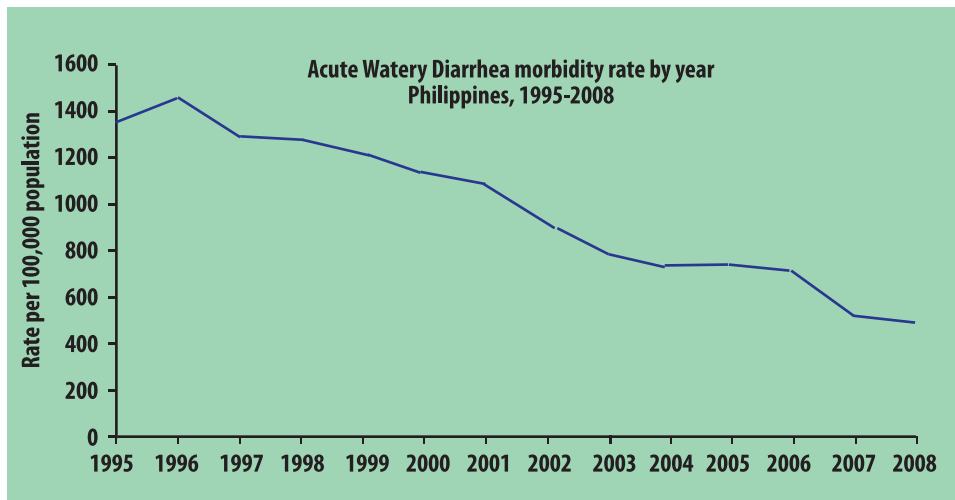
Although the incidence rates of acute watery diarrhea have been decreasing since the 1990s (Figure 3), diarrhea still remains to be a significant cause of morbidity in the Philippines. In 2008, acute watery diarrhea ranked fifth among the ten leading causes of morbidity, with an incidence rate of 485.4 per 100,000, while the incidence rates for cholera and acute bloody diarrhea were 0.2 per 100,000 and 5.0 per 100,000, respectively (DOH, 2008).

occurred in children below five years of age. A cholera outbreak was reported in 2005 (Guiuan LGU, 2010).

### Diagnosis

There are four types of diarrhea: acute watery diarrhea, acute bloody diarrhea or dysentery, persistent diarrhea, and diarrhea in the severely malnourished or the severely ill. The types of diarrheal diseases are recognized based on their clinical features.

Acute watery diarrhea is the passage of unusually loose or watery stools three times or more in a period of 24 hours with a duration of less than 14 days. Cholera should be suspected when a child older than five years or an adult develops severe dehydration from acute watery diarrhea, usually with vomiting, or when a child older



**Figure 6.** Acute watery diarrhea morbidity rates in the Philippines, 1995 to 2008 (DOH, 2008)

In Dagupan City, acute watery diarrhea was the third leading cause of morbidity with an incidence rate of eight cases per 1,000 population, while there were 980 hospital admissions and five cases of mortality (0.03 per 1,000 population) in 2009. All diarrhea-related mortalities involved children below five years of age. There were also two cases of cholera and 39 cases of amoebiasis in Dagupan in 2009 (Dagupan LGU, 2010).

In Guiuan, acute watery diarrhea was the second leading cause of morbidity from 2004 to 2009, with a rate of six cases per 1,000 population in 2009. In the same year, there were 126 hospital admissions and two cases of mortality (0.04 per 1,000 population). All diarrhea-related deaths

than two years develops acute watery diarrhea when cholera is known to be occurring in the area. In younger children, cholera may be difficult to distinguish from acute watery diarrhea of other causes, especially rotavirus (WHO, 2005).

Dysentery is considered if blood is present in diarrheic stool. Persistent diarrhea has a duration of at least 14 days, during which periods without diarrhea have not exceeded two days. Diarrhea in the severely malnourished is diagnosed when the child with diarrhea has below height- or weight-for-age or has edema with muscle wasting and other signs of marasmus. Diarrhea in the severely ill is caused by serious non-intestinal infections and usually presents with systemic signs such as that of

pneumonia or meningitis (WHO, 2005).

The degree of dehydration should always be assessed in cases of acute watery diarrhea. The degree of dehydration is classified according to signs and symptoms that reflect the amount of fluid lost. The current classifications of dehydration caused by diarrhea are “no signs of dehydration”, “some dehydration”, and “severe dehydration”. In the early stages of dehydration, there are no signs and symptoms. As dehydration progresses, the patient may develop thirst, restlessness, irritability, decreased skin turgor, sunken eyes, or sunken fontanel in infants. In severe dehydration, the patient may develop extreme thirst and other signs of hypovolemic shock such as diminished consciousness, decreased urine output, cool extremities, feeble pulse, peripheral cyanosis, and low or undetectable blood pressure (WHO, 2005).

Laboratory tests are important especially for the diagnosis of epidemic-prone diarrheal diseases such as cholera and bloody diarrhea. For cholera suspects, stool cultures for *V. cholerae* O1 and O139 should be done. For patients with acute bloody diarrhea, microscopic stool examination by DFS for trophozoites of *E. histolytica* may be done. Fecal Gram stain and culture, fecal leukocyte examination, serotyping, toxin identification, and viral identification can also be done (WHO, 2005b).

Diagnostic tests are also required when treatment other than fluid replacement is expected, such as in persistent diarrhea or diarrhea in the severely malnourished or in the severely ill (WHO, 2005). DFS may be done to check for trophozoites of *Giardia* in patients with persistent diarrhea. In the patients with severe malnutrition or severe non-intestinal illness, laboratory work-up for systemic infections and illness is warranted upon admission at a hospital (WHO, 2005).

### Treatment

The four types of diarrhea have different complications, and the management strategies for each type of diarrhea depend on the treatment and prevention of their respective complications. Dehydration is the main complication associated with acute watery diarrhea, as well as in cholera. Weight loss may also occur in acute watery diarrhea if feeding is not continued. Dysentery leads to damage of the intestinal mucosa, sepsis, and malnutrition. Dehydration may also occur in dysentery. For persistent diarrhea, malnutrition and serious

non-intestinal infection are the main risks involved. In diarrhea with severe malnutrition, severe systemic infection, dehydration, heart failure, and vitamin and mineral deficiency can occur (WHO, 2005).

### Treatment of acute watery diarrhea

The objectives of treatment of acute watery diarrhea include the prevention of dehydration, treatment of dehydration if present, prevention of nutritional damage, and reductions in the duration and severity of diarrhea as well as in the occurrence of future episodes (WHO, 2005). Table 8 serves as a guide for fluid administration after each loose stool for the replacement of the existing water and electrolyte deficit.

**Table 8.** Fluid administration after each loose stool during an episode of diarrhea

Age group	Amount of fluid replacement
Children below two years of age	50-100 mL
Children age two to 10 years	100-200 mL
Children older than 10 years and adults	As much fluid as they want

(Source: WHO, 2005)

While treatment to replace the existing water and electrolyte deficit is in progress, the normal daily fluid requirements must also be met. As a general rule, a patient is given as much fluid as the child wants until the diarrhea stops (WHO, 2005).

Home fluids should include at least one fluid that normally contains salt. Suitable fluids for diarrhea that normally contain salt include oral rehydration salt (ORS) solution and salted drinks such as rice water or soups (WHO, 1993). Plain clean water should also be given to children with dehydration. A home-made ORS solution is not recommended because the preparation may not be sufficient for electrolyte replacement (WHO, 2005).

The WHO and UNICEF promote the use of reformulated ORS for diarrhea (WHO and UNICEF, 2006). The reformulated ORS solution has lower osmolality, which prevents the undesirable effects of hypertonicity or net fluid absorption (Duggan et al., 2004; Hahn et al., 2001). The new ORS solution reduces the need for supplemental intravenous (IV) fluid therapy by 33% after initial rehydration when compared with the previous standard WHO ORS solution. The reformulated ORS solution also reduces the incidence of vomiting by 30% and stool vo-



lume by 20% (UNICEF and WHO, 2001).

Although the use of reformulated ORS has been associated with increased risk of transient asymptomatic hyponatremia, large scale studies did not demonstrate increased risk of symptomatic hyponatremia (WHO and UNICEF, 2006). The new reformulated ORS solution has a 3% or less probability of treatment failure, or the persistence or reappearance of signs of dehydration after administration. The usual causes for treatment failure include insufficient intake of ORS solution due to fatigue or lethargy, severe vomiting, and/or continuing rapid stool losses, such as in cholera (WHO, 2005).

The rare contraindications for ORS treatment include abdominal distension with paralytic ileus, which may be caused by opiate drugs, and hypokalemia. Another contraindication is glucose malabsorption, which is indicated by marked increase in stool output, lack of improvement in hydration status, and/or the presence of a large amount of glucose in the stool when ORS solution is administered (WHO, 2005).

Some fluids should be avoided during episodes of diarrhea. Drinks sweetened with sugar such as commercial carbonated beverages and fruit juices can cause osmotic diarrhea and hypernatremia. Fluids such as coffee or tea should also be avoided because of their diuretic or purgative effects (WHO, 2005).

For cholera, the initial treatment consists of fluid and electrolyte replacement. Rice-based ORS is superior to standard ORS for cholera (WHO, 1994). Large amounts of ORS solution may be required to replace large continuing losses of watery stool. The amount of stool lost is greatest in the first 24 hours of illness, usually requiring IV maintenance therapy with Ringer's Lactate solution (WHO, 2005).

WHO and UNICEF also endorse the administration of zinc supplements for

diarrhea (WHO and UNICEF, 2006). Zinc has critical roles in metallo-enzymes, polyribosomes, cell membrane and other cellular functions, cellular growth, and functions of the immune system. Zinc supplementation reduces the duration of acute diarrhea by 25.0%, duration of persistent diarrhea by 29.0%, treatment failure or death in persistent diarrhea by 40.0% (The ZINC Group, 2000), and the incidence of diarrhea for two to three months (WHO, 2005).

Vomiting is the only reported AE of any form of zinc supplementation for the treatment of diarrhea. There is currently no substantial evidence of adverse changes in the copper status as a result of short-term zinc supplementation for the treatment of diarrhea (WHO, 2006; Sazawal et al., 2004).

According to the FWBDPCP, clinical care of diarrheal diseases will focus on case management using ORS and rational use of diagnostic tests (DOH, 1997). The Maternal and Child Health Service (MCHS) provides the guidelines for management of diarrheal diseases in children below five years of age, with the goals of prevention and treatment of dehydration, prevention of nutritional damage, reduction of the duration and severity of diarrhea and reduction of future episodes of diarrhea (DOH, 2007). The MCHS guidelines for the treatment of diarrheal diseases at the community level include the WHO/UNICEF-recommended interventions of reformulated ORS and zinc supplement administration among children less than five years of age (DOH, 2007).

In patients with acute watery diarrhea, particularly in children less than five years of age, the first steps of treatment are the assessment of dehydration and selection of appropriate treatment based on degree of dehydration (DOH, 2007). Table 9 contains the categories for assessment of patients with diarrhea.

Treatment Plan A involves home treatment for category A diarrhea. The

**Table 9.** Assessment of dehydration in patients with diarrhea

	Category A	Category B	Category C
Look at:			
General condition	Alert	Restless, irritable	Lethargic <sup>a</sup> /unconscious
Eyes	Normal	Sunken <sup>b</sup>	Sunken <sup>b</sup>
Thirst <sup>c</sup>	Drinks normally	Thirsty, drinks eagerly	Drinks poorly / unable to drink
Feel:	Goes back quickly	Goes back slowly	Goes back very slowly
Skin pinch <sup>c</sup>			
Decide	No signs of dehydration	If with > 2 signs in B, there is some dehydration	If with > 2 signs in C, there is severe dehydration
Treat	Treatment Plan A	Treatment Plan B	Treatment Plan C

<sup>a</sup> Child cannot be fully awakened and may appear to be drifting into unconsciousness.

<sup>b</sup> In some children, the eyes may normally appear somewhat sunken, thus it is a good practice to ask the mother if the eyes are normal or more sunken than usual.

<sup>c</sup> Skin pinch is less useful in obese children or those with marasmus or kwashiorkor.

(Source: DOH, 2007)



mother of the patient should be advised on the four rules of home treatment (Table 10).

**Table 10.** *The four rules of home treatment for diarrhea*

- Rule 1. Give extra fluid
- Rule 2. Give zinc supplementation
- Rule 3. Continue feeding
- Rule 4. Advice when to return to the health facility

(Source: DOH, 2007)

According to Rule 1, a child should be given as much fluid as the child can tolerate. Mothers should be advised to breastfeed frequently and for longer periods. Exclusively breastfed children could be given ORS or clean water in addition to breast milk, while children who are not exclusively breastfed could be given ORS, clean water, or food-based fluids (WHO and UNICEF, 2008; DOH, 2007).

The mother of the child should be given two packs of ORS for home use and should be taught how to prepare ORS. The mother should be advised to give additional fluid to augment the usual fluid

Rule 2 states that the mother should be advised on the dose, duration, and administration of zinc supplementation. For children less than six months old, the zinc tablet is dissolved in a small amount of expressed breast milk, ORS, or clean water. Children six months to five years of age can be given tablets to be chewed or dissolved in a small amount of clean water. The mother should be advised to give zinc supplements for 10-14 days (WHO and UNICEF, 2008; DOH, 2007). Table 11 contains the preparations and dosing of zinc supplements.

Feeding should continue during an episode of diarrhea according to Rule 3 (DOH, 2007). Continued feeding prevents the development of malnutrition and facilitates faster recovery of the intestinal mucosa (WHO, 2005). Mothers are advised to breastfeed more frequently and for long periods. Children should be encouraged to eat as much as they want and should be offered small and frequent meals. Children above six months of age should be given food with the highest amount of nutrients and calories, such as meat, fish, eggs, and dairy products. The addition of oil to these

**Table 11.** *Preparation, dose and duration of zinc supplementation for patients with diarrhea*

Target	Preparation	Dose / duration
Children less than six months of age	Drop: 27.5 mg/mL (equivalent to 10 mg elemental zinc) 15 mL drops (as sulfate monohydrate)	1 mL once a day for 10-14 days
	Syrup: 27.5 mg/mL (equivalent to 10 mg elemental zinc) 60 mL syrup (as sulfate monohydrate)	1 mL once a day for 10-14 days
Children six to 59 months of age	Scored and dispersible tablet: 20 mg zinc as sulfate monohydrate (USP31) or zinc gluconate	1 tablet once a day for 10-14 days
	Syrup: 55 mg/mL (equivalent to 20 mg elemental zinc) 60 mL syrup (as sulfate monohydrate)	5 mL or 1 teaspoon once a day for 10-14 days

(Source: DOH, 2007)

intake, as shown in Table 8. The mother should be taught to give small and frequent sips from a cup and to continue additional fluid administration until diarrhea stops. If the child vomits, the mother should be instructed to wait for 10 minutes before feeding is resumed. Mothers should be advised against the use of sports drinks because of their low sodium content which can cause hyponatremia and its high carbohydrate content which can provoke osmotic diarrhea (WHO and UNICEF, 2008; DOH, 2007).

foods makes them energy-rich. Fresh fruit juices and bananas are good sources of potassium (WHO and UNICEF, 2008; DOH, 2007).

Mothers should be advised to avoid giving high fiber or bulky foods such as coarse fruits, vegetables, and whole grain cereals because these are hard to digest. Mothers should also avoid giving foods with lots of sugar and very dilute soups because of the lack of nutrients (WHO and UNICEF, 2008; DOH, 2007).



According to Rule 4, mothers should be instructed to bring the child to the health center if the child develops danger signs, which include inability to eat or drink, exhibiting extreme thirst, developing a fever, and/or showing no signs of improvement after three days (WHO and UNICEF, 2008; DOH, 2007).

Treatment Plan B involves the treatment of children with some dehydration with ORS at the health center. The recommended amount of ORS will be given over a four-hour period (Table 12). Addi-

reclassified accordingly. The treatment plan appropriate to the current status should be administered. Oral feeding as tolerated by the child should be resumed (WHO and UNICEF, 2008; DOH, 2007).

If the patient must leave the clinic before completing treatment, the mother should be advised on the remaining amount of ORS that must be administered within the four-hour period. The mother should be given enough ORS to complete the four-hour treatment, and two additional ORS for home treatment according to

**Table 12.** Amount of ORS to be given during the first four hours of treatment of dehydration

Age <sup>a</sup>	< 4 months	4-12 months	12-24 months	2-5 years
Weight <sup>b</sup> (kg)	< 6	6-9.999	10-11.999	12-19
ORS (mL)	200-400	400-700	700-900	900-1400

<sup>a</sup>Use the age if the weight of the child cannot be determined.

<sup>b</sup>The amount of ORS required could also be approximated by weight (kg) multiplied by 76.  
(Source: WHO/UNICEF, 2008)

tional ORS could be given if the child wants more. For children who are not breastfed, 100-200 mL of clean water may be given (WHO and UNICEF, 2008; DOH, 2007).

After four hours, the status of dehydration should be reassessed and

Treatment Plan A. The mother should be advised on the four rules of home treatment for diarrhea (Table 11) (WHO and UNICEF, 2008; DOH, 2007).

Treatment Plan C involves the treatment of children with severe dehydra-

**Table 13.** Antimicrobials used to treat specific causes of diarrhea

Cause	Antibiotic of choice <sup>a</sup>	Alternative antibiotics
Cholera <sup>b,c</sup>	Doxycycline Adults: 300 mg PO, single dose or Tetracycline Children: 12.5 mg/kg PO, 4 times a day x 3 days Adults: 500 mg PO, 4 times a day x 3 days	Erythromycin Children: 12.5 mg/kg PO, 4 times a day x 3 days Adults: 250 mg PO, 4 times a day x 3 days
Shigella dysentery <sup>b</sup>	Ciprofloxacin Children: 15 mg/kg PO, 2 times a day x 3 days Adults: 500 mg PO, 2 times a day x 3 days	Pivmecillinam Children: 20 mg/kg PO, 4 times a day x 5 days Adults: 400 mg PO, 4 times a day x 5 days or Ceftriaxone Children: 50-100 mg/kg IM, once a day x 2 to 5 days
Amoebiasis	Metronidazole Children: 10 mg/kg PO, 3 times a day x 5 days (10 days for severe disease) Adults: 750 mg PO, 3 times a day x 5 days (10 days for severe disease)	
Giardiasis	Metronidazole <sup>d</sup> Children: 5 mg/kg PO, 3 times a day x 5 days Adults: 250 mg PO, 3 times a day x 5 days	

<sup>a</sup> All doses shown are for oral administration. If drugs are not available in liquid form for use in young children, it may be necessary to use tablets and estimate the doses given in this table.

<sup>b</sup> Selection of an antimicrobial should be based on sensitivity patterns of strains of *Vibrio cholerae* O1 or O139, or *Shigella* recently isolated in the area.

<sup>c</sup> An antimicrobial is recommended for patients older than 2 years with suspected cholera and severe dehydration.

<sup>d</sup> Tinidazole can also be given in a single dose (50 mg/kg orally).  
(Source: WHO, 2005)





tion, consisting of urgent hospital referral (DOH, 2007).

Antimicrobials should not be used routinely for acute watery diarrhea. It is not possible to clinically distinguish diarrhea that might respond to treatment with antibiotics. Selecting an effective antimicrobial requires knowledge of the sensitivity of the causative agents, which is usually unavailable. The use of antimicrobials provides additional costs and risks of adverse events. Additionally, widespread antibiotic administration can contribute to the development of bacterial resistance (WHO, 2005).

In acute watery diarrhea, antimicrobials may be given to patients with suspected cholera and severe dehydration, or to patients who are severely immunocompromised or severely ill (WHO, 2005). Table 13 contains the drugs for specific causes of diarrhea.

Antidiarrheals and anti-emetics have no practical benefits for patients with diarrheal diseases, and their administration during an episode of diarrhea may cause complications (WHO, 1990).

#### **Treatment of acute bloody diarrhea**

Children with bloody diarrhea should be assessed for dehydration and malnutrition. Appropriate fluids should be given for dehydration. Children with severe malnutrition should be admitted to a hospital (WHO, 2005).

**Table 14.** Ineffective antimicrobials for treatment of shigellosis

Metronidazole	Amoxicillin
Streptomycin	Nitrofurantoin
Tetracycline	Aminoglycosides
Chloramphenicol	Cephalosporins (first and second generation)
Sulfonamides	Nalidixic acid

(Source: WHO, 2005)

Patients with bloody diarrhea should be treated for three days with ciprofloxacin or five days with other antibiotics to which most *Shigella* in the area are sensitive to, since *Shigella* causes most episodes of bloody diarrhea and almost all episodes of shigellosis are severe. The development of antibiotic resistance by *Shigella* is frequent and the pattern of resistance is unpredictable. Antibiotics listed in Table 14 should never be given for shigellosis, regardless of the sensitivity of local strains (WHO, 2005).

The mother of a child should be advised to bring the child back in two days for reassessment and/or further management if the child is less than one year of age or has no signs of clinical improvement. Children who were initially dehydrated or had measles during the past six weeks should also follow-up in two days (WHO, 2005).

Amoebiasis is considered in patients without clinical improvement in two days or after treatment with two drugs usually effective for *Shigella*. Appropriate antibiotics for amoebiasis (Table 13) should be given if microscopic stool examination demonstrates trophozoites of *E. histolytica* containing red blood cells (DOH, 1993; WHO, 2005).

#### **Treatment of persistent diarrhea**

The objective of treatment for persistent diarrhea is to correct malnutrition and restore intestinal function. Treatment of persistent diarrhea consists of appropriate rehydration, nutritious diet, vitamins and mineral supplementation including zinc and appropriate antimicrobials. Patients with persistent diarrhea can be treated at home with careful follow-up. Mothers should be advised to follow-up within five days or to return any time the child develops danger signs (WHO, 2005).

ORS treatment is generally well-tolerated in patients with persistent diarrhea. In a few patients with impaired glucose absorption, ORS treatment may aggravate dehydration, and hospital admission for IV rehydration may be required. Infants below four months of age and children with a serious systemic infection, severe malnutrition, or with signs of dehydration should be admitted in a hospital for management (WHO, 2005).

Routine use of antimicrobial in patients with persistent diarrhea is not effective and should not be given. Diagnosed systemic infections and intestinal infections should be treated appropriately. Drugs for giardiasis should only be given when trophozoites have been demonstrated in the microscopic stool examination of a patient with persistent diarrhea (DOH, 1993; WHO, 2005). Table 13 contains the treatment regimen for giardiasis.

#### **Treatment of diarrhea with severe malnutrition**

Treatment of diarrhea in severely malnourished patients must focus on the management of the malnutrition and other infections. All severely malnourished

children should receive broad spectrum antimicrobial treatment for several days. Hospital admission is required in the management of severely malnourished patients (WHO, 2005).

### Prevention and Control

The target of the FWBDPCP for diarrheal diseases is to reduce the morbidity rate to 750 cases per 100,000 and the mortality rate to less than one death per 100,000 by 2010 in all age groups. For outbreaks of food and waterborne diarrheal diseases, the FWBDPCP aims to reduce confirmed outbreaks of cholera to zero (DOH, 2005). According to the NSSP, the incidence of acute gastroenteritis (AGE) should be reduced by 60% in 2016 and near zero by 2022 (DOH, 2010).

The FWBDPCP promotes health education and information dissemination, especially the 10 Golden Rules for Safe Food Preparation (Table 15), Safe Water Source, and Environmental Sanitation of the WHO.

**Table 15.** The 10 "Golden Rules" for safe food preparation of the WHO

- Choose foods processed for safety.
- Cook food thoroughly.
- Eat cooked foods immediately.
- Store cooked foods carefully.
- Reheat cooked foods thoroughly.
- Avoid contact between raw foods and cooked foods.
- Wash hands repeatedly.
- Keep all kitchen surfaces meticulously clean.
- Protect food from insects, rodents, and other animals.
- Use safe water.

(Source: [www.who.int](http://www.who.int))

The strategies for the control and prevention of diarrheal diseases include the use of safe water for drinking, safe food preparation, and good personal hygiene. Sanitation, hygienic behavior, breastfeeding, proper nutrition, and measles immunization are also emphasized (WHO, 2005).

Because the organisms that cause diarrhea are excreted in the stools of an infected patient, hygienic behavior such as the proper use of latrines and the safe disposal of stools help in the interruption of transmission of diarrheal diseases (WHO, 2005). Hand washing with soap is associated with decreased incidence of diarrheal disease and associated severe outcomes significantly (Curtis and Cairncross, 2003). Hand washing should be done after defecation or after disposal of the stool of a child. Hand washing should also be performed before preparing food and eating since food can be contaminated by diarrheal agents at all stages of production and preparation (WHO, 2005).

Exclusively breastfed infants are less likely to have diarrhea or to die from it compared with infants who are partially

breastfed or not breastfed at all. Breast milk is clean and not contaminated with diarrhea-causing agents. Additionally, breast milk has immunologic properties that protect the infant from infections, including diarrhea. Infants should be exclusively breastfed until six months of age, and breastfeeding should continue until two years of age (WHO, 2005). Measles immunization significantly reduces the incidence and severity of diarrheal diseases. Every infant should be immunized against measles at the recommended age (WHO, 2005).

Good feeding practices involve selecting nutritious foods and using hygienic practices when preparing them. Complementary foods consisting of eggs, meat, fish, fruits, and vegetables should normally be started when a child is six months old (WHO, 2005).

### Surveillance and Monitoring

Epidemic-prone diarrheal diseases, such as cholera and acute bloody diarrhea, are among the priority diseases targeted for surveillance in the country (DOH, 2008). In the identification of cases of cholera and acute bloody diarrhea, the Philippine Integrated Disease Surveillance and Response (PIDSR) uses standard case definitions for the diseases under surveillance, which are consistent with the WHO Recommended Surveillance Standards. Simple case definitions are also available for use by the Disease Reporting Advocates (DRAs) (DOH, 2008). The standard case definitions will be used in the recording and reporting of the diarrheal diseases. Table 16 contains the standard case definitions of cholera and acute bloody diarrhea.

**Table 16.** Standard case definitions for epidemic-prone diarrheal diseases

Disease	Standard case definition
Acute bloody diarrhea	Acute diarrhea with visible blood in the stool
Cholera*	<p><u>Suspected case:</u></p> <p><i>Disease unknown in the area:</i> a person 5 years old or above with severe dehydration or who died from acute watery diarrhea</p> <p><i>Disease endemic in the area:</i> a person aged 5 years old or above with acute diarrhea with or without vomiting</p> <p><i>In an area with cholera epidemic:</i> a person with acute watery diarrhea</p> <p><u>Confirmed case:</u> Case with laboratory confirmation</p>

\*Cholera could appear in children below five years of age, but the inclusion of all cases of acute watery diarrhea in the 2-4 years age group greatly reduces the specificity of reporting. For the management of patients with acute watery diarrhea in cholera-endemic areas, cholera should be suspected in all patients. (Source: DOH, 2008)



Confirmatory diagnosis of cholera and acute bloody diarrhea during routine surveillance should be performed using standardized laboratory methods. During an outbreak of an epidemic-prone diarrheal disease, specimen collection for laboratory diagnosis should be mandatory for its investigation. Stool specimens may be brought to tertiary laboratories for bacterial culture for suspected cholera cases, and stool culture as well as microscopic examination for dysentery (DOH, 2008).

In the surveillance of epidemic-prone diarrheal diseases, an intensive case-based data collection through facility- and community-based approach is utilized, wherein cases or events detected in the community and health facilities are reported and gathered every week (DOH, 2008).

DRAs are individuals who have attended an orientation on the PIDSR. DRAs may include community leaders, BHWs, and traditional healers. DRAs are expected to report information regarding notifiable diarrheal diseases obtained from the community, schools, or media to a Disease Surveillance Coordinator (DSC) in a Barangay Health Station (BHS) (DOH, 2008).

Disease Reporting Units (DRUs) include the BHSs, government and private hospitals or clinics, government and private laboratories, as well as ports and airports. DRUs are expected to report cases of notifiable diarrheal diseases to the DSCs in CHO/RHU or to the Disease Surveillance Officer (DSO) in the City Epidemiology and Surveillance Unit (CESU) in chartered cities. DRUs with local laboratory capacity can help diagnose suspected cases. Standard protocols for the collection, processing, and transport should be followed (DOH, 2008).

The DSCs are health facility staff of government and non-government units in the CHOs/RHUs trained on PIDSR. DSCs are expected to consolidate, analyze, and interpret the data from the different DRUs, and to submit a report to the DSO of the Provincial Epidemiology and Surveillance Unit (PESU) every Friday of the week. The DSCs should prepare and disseminate a Weekly Notifiable Disease Report. The DSCs are also expected to conduct the preliminary investigations on the cases reported by the DRUs (DOH, 2008).

The DSOs are trained physicians or nurses who are members of the Epidemiology and Surveillance Units (ESU) in health

offices of chartered cities, provinces, and regions. The DSOs shall be responsible for the collection, analysis, and interpretation of data from DSCs. The DSOs in the CESU in chartered cities and PESU will forward reports to the DSO in the Regional Epidemiology and Surveillance Unit (RESU), that will then report to the DOH National Epidemiology Center (NEC). DSOs will also coordinate with and give feedback to the CHO/RHU and CHD regarding control strategies for the cases (DOH, 2008).

In the interpretation of surveillance data of notifiable diarrheal diseases, the current situation is compared with that of previous months or years to assess if certain thresholds are reached. The alert threshold refers to the level of incidence that serves as an early warning for epidemics. Attainment of the alert threshold will trigger investigations, evaluation of epidemic preparedness, and implementation of prevention and control programs. The epidemic threshold refers to the level of occurrence of disease above which an urgent response is required (DOH, 2008).

For acute bloody diarrhea, the alert threshold is the increasing number of cases over a short period, and the epidemic threshold is the confirmation of the suspected cases. For cholera, the alert threshold is a single suspected case and the epidemic threshold is the laboratory confirmation of one case in an area with no previously reported cases (DOH, 2008).

The aggregated report on the incidence of acute bloody diarrhea and cholera from the PIDSR will be incorporated into the annual morbidity report of the Field Health Service Information System (FHSIS) of the DOH (DOH, 2008). Monitoring of non-epidemic-prone communicable diseases, such as acute watery diarrhea in areas without cholera epidemic, is part of the routine FHSIS. The main indicators for the community-based control of diarrhea are the total number and incidence of diarrheal cases among all age groups, as well as the coverage rates of reformulated ORS and zinc supplement administration among children less than five years of age. The computation for the incidence of diarrheal diseases at the LGU level per 1,000 population is stated below (DOH, 2007a).

$$\frac{\text{Number of cases of diarrheal diseases}}{\text{Total population}} \times 1,000$$





## Framework for the Implementation of the Disease Prevention and Control Program for STH Infections and Diarrheal Diseases

The Disease Prevention and Control Program (DPCP) for STH infections and diarrheal diseases is based on existing guidelines of the DOH and is generally consistent with guidelines promoted by the WHO. The framework for the implementation of the DPCP includes approaches and strategies that provide effective and efficient means of program implementation at the local level in the pursuit and attainment of the targets set by the DOH. The proposed approaches and strategies in this framework include some of the good practices and means to address the continuing challenges of program implementation.

### *Approaches in the implementation of the DPCP*

#### *LGU led*

While the DOH formulates policies and provides technical support by way of provision of training on disease prevention and control including surveillance, the LGU will lead in the implementation of the DPCP at the local level and shall spearhead the various endeavors of the DPCP, including the establishment and support of a local action committee or task force, and forging of partnerships at the local level. The LGU, in collaboration with its partners, will oversee baseline community assessment, implementation of strategies for prevention and control, as well as surveillance and monitoring. After having been capacitated, the LGU will likewise spearhead capacity building, advocacy, social mobilization, and program marketing at the local level.

#### *Builds upon social values of solidarity and cooperation*

The DPCP builds upon the social values of solidarity and cooperation through community involvement and multi-sectoral collaboration. While the LGU is tasked to deliver the complete package of health services related to disease prevention and control as detailed in existing DOH policies and guidelines, other sectors and partners at the community level are encouraged to collaborate towards effective disease prevention and control. Examples of such collaborations may include:

#### LGU and education sector

- Trained health staff and school health staff may provide training opportunities for teachers to get engaged in health education and information dissemination for the prevention and control of STH infections and diarrheal diseases.
- Trained teachers may assist in anthelmintic administration during MDA among elementary school pupils (Figure 7).
- The Parent-Teacher Association (PTA) may be tapped to help increase compliance to MDA through the conduct of PTA advocacy meetings, thereby increasing MDA coverage rates.
- Optimization of the link between health and education sectors may be exemplified by the Essential Health Care Package (EHCP) of the DepEd, which aims to institutionalize daily supervised hand washing with soap, daily tooth brushing with fluoride toothpaste, and twice a year teacher-assisted MDA among school children. The EHCP utilizes the education sector as program implementers, with direct involvement of teachers in drug distribution and administration (Monse et al., 2008).



**Figure 7.** School teachers helping in MDA in elementary students (Photo courtesy of Dr. Vicente Y. Belizario, Jr.)

#### LGU health and social welfare and development sectors

- Day care workers may promote hygienic behavior including breast-feeding among mothers and could participate in the surveillance of diarrheal diseases.
- Involvement of the day care workers may help increase MDA coverage in preschool children through information dissemination to parents and assisting in anthelmintic distribution and administration in day care centers.

#### LGU health and environment sectors

- Collaboration of the LGU health and environment sectors may help improve access to safe water and sanitary facilities. Collaboration may help promote the Zero Open Defecation Program (ZODP) (Dalisay, 2010a; 2010b) and improve access to safe water and sanitary facilities.

#### LGU and BHWs

- LGU may help provide training opportunities for BHWs for early diagnosis, management, referral, and surveillance of STH infections and diarrheal diseases.

#### LGU and private sector

- Media, socio-civic groups, and other concerned parties from the private sector may help raise awareness for prevention and control of STH infections and diarrheal diseases. Partners may provide materials for awareness raising that may include billboards, streamers, posters, and leaflets. Opportunities to air messages via television and radio may be explored.

#### Capacity building

The DPCP aims to enhance the capabilities and competencies of local stakeholders, particularly the local health units, for the overall implementation of strategies for disease prevention and control, including surveillance. In addition, the DepEd health staff may be targeted for capacity building to help improve health service delivery in the school setting, which may eventually result in the reduction of the number of

consultations in the local health unit. The DOH plays a major role by providing opportunities for capacity building of the LGU and school health staff. The LGU and partner agencies may provide counterpart funding and other support for capacity building at the local level.

#### Diagnosis

- Training for medical technologists of local health units and hospitals on the laboratory diagnosis of intestinal parasitoses and diarrheal diseases may be conducted in collaboration with established academic institutions using WHO-recommended techniques and materials. Training should ideally include quality control and quality assurance, as well as proper recording and reporting of results.
- Diagnostic laboratories should be provided with adequate supplies and equipment for the diagnosis of intestinal parasitoses.

#### Management of diarrheal diseases

- Physicians and other health workers in the local health units and hospitals may be given continuing education on the diagnosis and management of diarrheal diseases, which includes rational use of diagnostic tests and antibiotics, as well as management of AEs associated with anthelmintics, the reformulated ORS, and zinc supplementation.
- Local health unit and hospital staff may be trained in the assessment and management of dehydration in diarrheic patients.
- Reformulated ORS and zinc supplements should readily be available in all treatment facilities.

#### Prevention and control of STH infections and diarrheal diseases

- Effective delivery of key messages on prevention and control of the target diseases is essential. Seminars on health communications focused on prevention and control measures (to



include proper method of drug administration and approaches on the prevention and management of AEs) may be conducted for local health unit and hospital staff, DepEd personnel, community leaders, local media practitioners, and other partners.

#### Surveillance and monitoring of STH infections

- Local health units may be oriented and trained on WHO-recommended indicators for helminth control program monitoring (parasitologic, coverage of intervention, nutritional indicators, other morbidity indicators), including proper reporting of data.
- Local health units and hospital staff, DepEd staff, and other partners may be trained on assessment, management, and reporting of AEs.
- Medical technologists should receive training on WHO-recommended laboratory techniques and on proper recording and reporting of data.

#### Surveillance and monitoring of diarrheal diseases

- The ESU may be strengthened through training on the PIDSR. Targeted individuals include LGU and hospital staff as well as members of the community who may serve as DRAs.

#### Community empowerment

- Community empowerment will manifest through communities that are able to:
  - Formulate and implement an action plan that details strategies for the prevention and control as well as surveillance and monitoring of STH infections and diarrheal diseases
- Provide budget allocation for logistical needs and delivery of services

- Ensure regular supply of anthelmintics for MDA, reformulated ORS, and zinc supplements
- Provide support for information, education, and communication
- Formulate local policies and ordinances for the prevention and control as well as surveillance and monitoring of the diseases in support of national policies
- Formulate an incentive scheme for outstanding communities, schools, and partners
- Create the demand for prevention and control of the diseases to facilitate corresponding action from the national and local governments
- Local organizations such as socio-civic groups could be involved in the various processes of the DPCP especially in awareness raising activities.
- Empowered communities have co-ownership of disease prevention and control programs, and make provisions for their sustainability.

#### Public-private partnership

- Government agencies, such as DOH-NCDPC and DOH-NEC, provide technical assistance to LGUs and their partners.
- International agencies, such as the Swedish International Development Cooperation Agency (SIDA) and WB-WSP, provide technical assistance as well as logistical support.
- Academic institutions provide technical assistance by way of capacity building and research to generate evidence for policy and planning.
- Non-government organizations (NGOs) may provide support for social mobilization as well as research generation.
- Local media practitioners and other partners could help provide information and contribute to health education and marketing of the DPCP.



**Figure 8.** Steps in the implementation of the DPCP



## Step 1: Formation of a Local Action Committee or Task Force

Since a multi-sectoral approach may be useful in the implementation of disease prevention and control programs, a local action committee or task force may be formed to provide a mechanism for intersectoral coordination and collaboration among various stakeholders. The committee may consist of representatives from the various stakeholders, including:

- DOH-CHD: STH coordinator, DSO, DOH representative/DOH Provincial Health Team Leader
- LGUs: Governor, Mayor, Provincial STH Coordinator, Provincial/City/Municipal Health Officer, PHN, DSOs, Health Education and Promotion Officer (HEPO), Sanitary Inspector (SI), Information Officer (IO), President of the Association of Barangay Captains
- DepEd: Division Superintendent, Division MO, District Supervisor, PTA Federation President
- Concerned community groups: socio-civic groups, religious organizations, Barangay Sanitation Volunteers
- Representatives of government hospitals and other treatment facilities



- Academe

The tasks of the local action committee or task force will include the following:

- Coordinate program implementation and monitoring
- Formulate an action plan
- Define the roles and responsibilities of the stakeholders
- Facilitate networking and collaboration among different sectors and agencies at the local level
- Review baseline and monitoring data, as well as trends of the diseases
- Evaluate the implementation of the DPCP and ZODP using established parameters
- Identify good practices and propose means to address challenges

The Zero Open Defecation Program (ZODP) shares similar strategies with the DPCP, including a local action committee or task force for its implementation (Dalisay, 2010a; 2010b). Since a significant overlap in membership exists between the local action committees for the DPCP and the ZODP, the unification of the two committees is strongly recommended.



## Step 2: Community Assessment

Community assessment of the city or municipality will be done prior to program implementation. The information that will be gathered from the community assessment will help in the formulation of the action plan that will include the delivery of the proposed strategies consistent with the DPCP. Data for community assessment shall include the following:

Morbidity and mortality due to STH infections and diarrheal diseases

- Cumulative prevalence and heavy intensity infection rates of STH infections among children age one to 12 years of age (in sentinel sites)
- NAT mean percentage score of school children
- Nutritional status data of children age one to 12 years of age
- Overall morbidity and mortality rates as well as number of hospital admissions due to diarrheal diseases

Procurement, quality control, and coverage of interventions (e.g., anthelmintic drugs, ORS, zinc supplements)

- Supply
- Procurement
- Delivery
- Storage
- Distribution
- Coverage rates

Health promotion and education

- Integration of DPCP into school curriculum
- Information, education, and communication (IEC) materials

Facilities and capability

- Number of elementary schools and enrollees

- Number of school teachers and school nurses oriented and trained on MDA
- Number of treatment facilities, including RHUs, government clinics, and hospitals
- Number of doctors, nurses and BHWs trained in the MDA/selective treatment of STH infections and management of diarrheal diseases
- Number of diagnostic facilities
- Number of medical technologists trained in the diagnosis of intestinal parasitoses and quality assurance

Community empowerment and sustainability

- Local legislation or ordinances supporting national strategies for the prevention and control as well as surveillance and monitoring of the diseases
- Budget allocation for program implementation, capacity building, program marketing, and other activities
- Community involvement
- Partnerships and collaborations

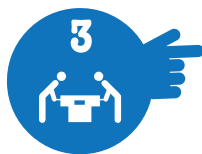
Marketing

- Activities that promote prevention and control of the diseases
- Involvement of media and other partners

Knowledge, attitudes, and practices of the community

- Effects of STH infections and diarrheal diseases on the health of community members
- Transmission of STH infections and diarrheal diseases
- MDA for STH infections





### Step 3: Development and Implementation of an Action Plan for DPCP

The action plan to be developed and implemented by the local action committee with the leadership of the LGU should include how targets and expected outputs in the major areas in disease prevention and control such as diagnosis, treatment, prevention and control, surveillance and monitoring, as well as advocacy and resource mobilization, are going to be met by way of proposed activities, persons responsible, timelines, and resources needed (Appendices 2a and 2b).

Because the DPCP is clearly related to the ZOD and other WASHED programs, it may be good to consider integrating plans for the DPCP and ZODP. To attain the goals

of the DOH for STH infections and diarrheal diseases, the DPCP advocates the complete package of the WASHED strategy (Evans, 2005), and additional strategies for diarrheal diseases, including treatment regimens, breastfeeding, and measles immunization (WHO, 2005). Surveillance and monitoring of the diseases are also included in the main strategies of the DPCP. The objectives, strategies, and approaches of the DPCP are in line with those of the ZODP, which aims for zero open defecation through the community-led total sanitation (CLTS) approach that focuses on behavioral change communication and hygiene promotion (Dalisay, 2010a; 2010b).

**Table 17.** DPCP and ZODP: summary of activities

Nature/description of activity	DPCP	ZODP
Disease focus	STH infections, diarrheal diseases, schistosomiasis	CLTS brings out issue of other diseases in the community
Overall implementation and oversight	City Health Officer/Municipal Health Officer	City Health Officer/Municipal Health Officer
On-ground activities	LGU with DepEd	Community/barangay-led
Surveillance	LGU with DepEd Community/barangay level	Community level by non-formal leaders
Personnel deployment	LGU with RHU staff collaborating with DepEd	Barangay Sanitation Volunteers for house-to-house mapping and follow-up





## Step 4: Advocacy Campaign

Advocacy with LGU and MOs will help heighten awareness and emphasize the importance of:

- Trained medical technologists performing WHO-recommended laboratory techniques for specific situations, including provision of support for baseline and parasitologic surveys
- Mass treatment of other high risk groups, including adolescent females, pregnant women, food handlers, and other occupational groups
- Synchronized MDA schedules for STH infections and LF in endemic areas to increase the efficiency of the program
- Health personnel who have received continuing education on the management of diarrheal diseases providing the recommended management for dehydration and other related complications of diarrheal diseases
- SIs doing periodic monitoring of water potability
- Sustaining CLTS to achieve zero open defecation
- Measles vaccination as part of the Expanded Program on Immunization (EPI) in support of the prevention of diarrheal diseases

Advocacy with LGU and school officials as well as health staff will lead to:

- Integration of DPCP into school curriculum
- Education campaigns on key hygienic behaviors
- Physical environment in schools that support the DPCP through provision of adequate sanitary and water facilities
- High MDA coverage in school children

- Treatment of out-of-school youth (OSY) through instructors of the DepEd Alternative Learning Scheme (ALS)
- DepEd being involved in baseline and follow-up parasitologic surveys



Advocacy with LGU and the Social Welfare and Development Office and the Social Welfare Officer will result in:

- Treatment of preschool children through day care workers supervised by local health unit staff
- Treatment of OSY, including street children

Advocacy with LGUs and collaborators, and potential partners at the community level will lead to:

- Participation of collaborators and partners in the local action committee or task force performing specific assigned roles and responsibilities in the delivery of strategies for the DPCP







## Step 5: Marketing

Marketing of the DPCP involves information dissemination and increased exposure of the program to the members of the community, collaborators, and potential partners to increase awareness on and encourage participation in the DPCP. Marketing will be done primarily through the initiatives of the LGU in collaboration with its partners through creative and innovative means. Technical support from the DOH and academe may help ensure success of marketing efforts.



**Figure 9.** Then DOH Secretary Francisco Duque and Antique Governor Salvacion Perez administering anthelmintics to students of Pandan Central School in Antique during the launching of War on Worms - Western Visayas (The Philippine Star, 2007)

Examples of marketing strategies include the following:

- A declaration by the local chief executive that DPCP is prioritized and supported by provision of enabling means (Figure 8).
- The DPCP is launched through a public event (Figure 9).

- The local chief executive declares the dates for the awareness campaign and actual strategy implementation e.g., “Diarrheal Diseases Awareness Day”, “MDA Day” or “Sanitation Day Celebration” for a whole administrative unit.
- Contests on slogan-, poster- and jingle-making are conducted in collaboration with partners (e.g. DepEd).

To promote the complete package of the DPCP, marketing of the prevention and control strategies for STH infections and diarrheal diseases may also be integrated in the marketing of other related strategies such as “Sanifairs” of the ZODP (Dalisay, 2010a; 2010b), marketing of GP every April and October (DOH, 2006a), and the marketing of the Nutrition Program during Nutrition Month in July.



**Figure 10.** Parade of school children and teachers during the launching of War on Worms - Biñan, Laguna (Photo courtesy of Dr. Vicente Y. Belizario, Jr.)



## Step 6: Monitoring and Evaluation

The local action committee will oversee the conduct of monitoring and evaluation using established parameters described in the section on surveillance and monitoring. The actual conduct of monitoring and evaluation activities ideally is done in collaboration with the DOH, DepEd, and other partners that may include the academe. Results should be presented and discussed in regular local action committee

meetings where good practices will be recognized and challenges will be tackled to help ensure that these are managed towards more favorable outputs and outcomes. Monitoring and evaluation data may also be shared with other LGUs in regional and national forums such as program implementation reviews (PIRs).

## ANNEXES

### Annex A. Parasitologic diagnosis of STH infections and other parasitic diseases

#### *Direct Fecal Smear*

The direct fecal smear (DFS) is primarily used in the detection of motile protozoan trophozoites. A DFS should contain approximately 2 mg of stool for the detection of helminth eggs. The stool sample is comminuted thoroughly with a drop of 0.85% sodium chloride solution and covered with a cover slip. Because the stool sample is small, light infections may not be detected (WHO, 1994).

#### *Kato Thick Method*

The Kato Thick method is useful in the detection of STH infections. The Kato Thick method makes use of 50 to 60 mg of stool placed over a glass slide and covered with cut cellophane paper soaked in a mixture of glycerine and malachite green solution. Usefulness is limited in watery stools and in the detection of protozoan cysts and trophozoites (WHO, 1994).

#### *Kato-Katz technique*

The Kato-Katz technique or the Cellophane Covered Thick Smear enables the quantitative diagnosis of STH infections.

In this procedure, the stool sample is sieved through a wire mesh and pressed under a cellophane paper soaked in glycerine-malachite green solution. A uniform amount of stool is examined through the use of a template with a uniform-sized hole in the middle. All eggs are counted in the whole preparation, and the total egg count is multiplied by a factor depending on the amount of the stool sample (multiply a 50 mg template by 20, 41.7 mg template by 24, and a 20 mg template by 50). Kato-Katz is useful for assessing the intensity of helminth infections (Table 2). Drier stool specimens yield higher egg counts than moist ones. The technique can only be done on fresh formed stools (WHO, 1994).

#### *Formalin ether/ethyl acetate concentration technique*

Formalin ether/ethyl acetate concentration technique (FECT) has high sensitivity for the detection of protozoan cysts and helminth eggs. FECT allows microscopic examination of one to 1.5 grams of feces. The technique makes use of 10% formalin, which serves as an all purpose fixative, and ether, which dissolves neutral fats in the stool (WHO, 1994).

## Annex B. Reporting of results of parasitologic assessment

**Table 1. Reporting of cumulative prevalence and heavy intensity STH infections at the school district level (parasitologic assessment for baseline and follow-up surveys)**

Schools	Number examined	Positive for STH Number (%)	Moderate - heavy intensity infections Number (%)
School 1			
School 2			
School 3			
School 4			
School 5			
<b>TOTAL</b>			

**Table 2. Reporting of prevalence and heavy intensity infection rate per species at the school district level (parasitologic assessment for baseline and follow-up surveys)**

Schools	Number examined	Positive for species ( <i>Ascaris</i> , <i>Trichuris</i> or hookworm) Number (%)	Light intensity species infection Number (%)	Moderate-heavy intensity species infection Number (%)
School 1				
School 2				
School 3				
School 4				
School 5				
<b>TOTAL</b>				

**Table 3. Reporting of cumulative prevalence and heavy intensity STH infections at the school division level (parasitologic assessment for baseline and follow-up surveys)**

School District	Number examined	Positive for STH Number (%)	Moderate-heavy intensity infections Number (%)
District 1			
District 2			
<b>TOTAL</b>			

**Table 4. Reporting of prevalence and heavy intensity infection rate per species at the school division level (parasitologic assessment for baseline and follow-up surveys)**

School District	Number examined	Positive for species ( <i>Ascaris</i> , <i>Trichuris</i> or hookworm) Number (%)	Light intensity species infection Number (%)	Moderate-heavy intensity species infection Number (%)
District 1				
District 2				
<b>TOTAL</b>				

**Table 5. Reporting of MDA coverage rates in school-age children per class**

<b>MDA Accomplishment Report</b> For the period: Instruction: To be filled up by school teachers Region: Province: City/Municipality: Service outlet: School Section: Prepared by:		
Name of student	With parent consent	Directly observed drug administration
Student A		
Student B		
Student C		
Student D		
Student E		
Student F		
(complete class list)		
Total		

## Annex B. Reporting of results of parasitologic assessment

**Table 6. Reporting of MDA coverage rates in school-age children per section**

<b>MDA Accomplishment Report</b> For the period: Instruction: To be filled up by grade level coordinator Region: Province: City/Municipality: Service outlet: School Grade: Prepared by:			
Section	Target population	Total number of children treated	Treatment coverage (% of children treated)
Section 1			
Section 2			
Section 3			
Section 4			
Section 5			
Total			

**Table 7. Reporting of MDA coverage rates in school-age children per grade**

<b>MDA Accomplishment Report</b> For the period: Instruction: To be filled up by principal or clinic teacher Region: Province: City/Municipality: Service outlet: School School: Prepared by:			
School	Target population	Total number of children treated	Treatment coverage (% of children treated)
Grade 1			
Grade 2			
Grade 3			
Grade 4			
Grade 5			
Grade 6			
Total			



**Table 8. Reporting of MDA coverage rates in school-age children per school**

<b>MDA Accomplishment Report</b> For the period: Instruction: To be filled up by DepEd PHN Region: Province: City/Municipality: Service outlet: School District: Prepared by:			
School grade	Target population	Total number of children treated	Treatment coverage (% of children treated)
School 1			
School 2			
School 3			
School 4			
School 5			
Total			

**Table 9. Reporting of MDA coverage rates in school-age children per district**

<b>MDA Accomplishment Report</b> For the period: Instruction: To be filled up by DepEd MO/PHN Region: Province: City/Municipality: Service outlet: School Division: Prepared by:			
School grade	Target population	Total number of children treated	Treatment coverage (% of children treated)
District 1			
District 2			
District 3			
District 4			
District 5			
Total			

## Annex B. Reporting of results of parasitologic assessment

**Table 10. Reporting of MDA coverage rates in *Garantisadong Pambata***

<b>MDA Accomplishment Report</b> For the period: Instruction: To be filled up by CHO/RHU PHN/RHM Region: Province: City/Municipality: Service outlet: Community Prepared by:			
Barangay	Target population	Total number of children treated	Treatment coverage (% of children treated)
Barangay 1			
Barangay 2			
Barangay 3			
Barangay 4			
Barangay 5			
Total			

**Table 11. Reporting of MDA coverage rates in LF-endemic areas**

<b>MDA Accomplishment Report</b> For the period: Instruction: To be filled up by CHO/RHU PHN/RHM Region: Province: City/Municipality: Service outlet: Community Prepared by:			
Barangay	Target population	Total number of persons treated	Treatment coverage (% of target population treated)
Barangay 1			
Barangay 2			
Barangay 3			
Barangay 4			
Barangay 5			
Total			

**Table 12. Reporting of treatment coverage rates in target populations in health facilities**

<b>MDA Accomplishment Report</b> For the period: Instruction: To be filled up by CHO/RHU PHN/RHM Region: Province: City/Municipality: Service outlet: RHU/Barangay Health Center Prepared by:			
Target population	Target population	Total number treated	Treatment coverage (%)
Adolescent females			
Pregnant women			
Food handlers			
Other groups			
Total			

**Table 13. Reporting adverse events with MDA**

<b>Adverse Events Reporting Form</b> For the period: Instruction: To be filled up by CHO/RHU Region: Province: Municipality: Service outlet: Prepared by:				
Name of patient	Age	Complete address	Chief complaint and date of onset	Action taken

Region: \_\_\_\_\_ Province: \_\_\_\_\_ Municipality: \_\_\_\_\_  
 Name of DRU: \_\_\_\_\_ Type: ☐RHU ☐CHO ☐Gov't Hospital ☐Private  
 Hospital ☐Clinic  
 Address: \_\_\_\_\_  
☐Seaport/Airport ☐Private Laboratory ☐Public Laboratory

Patient No.	Full name	Age	Sex	Date of Birth	Complete Address	Admitted	Date Admitted/ seen/ consulted	Onset of illness	Lab result	Outcome
Response Codes/ Instructions	First, middle, last	D-days M-months Yr-Years	F M	mm/dd/yy	House #, Street, Purok/Barangay, City/Municipality, Province	Y-Yes N-No	mm/dd/yy	mm/dd/yy	P-Positive (specify organism) N-Negative ND-Not done U-Unknown	A-Alive D-Died (specify date) U-Unknown

**Case definition:** A person with acute diarrhea with visible blood in the stool

**Note:** Laboratory culture of stools may be used to confirm possible outbreaks of specific diarrhea, such as *S. dysenteriae* type 1, but is not necessary for case definition

**Case Classification:** Not applicable

(Source: DOH, 2008)

Region: \_\_\_\_\_ Province: \_\_\_\_\_ Municipality: \_\_\_\_\_  
 Name of DRU: \_\_\_\_\_ Type: ☐RHU ☐CHO ☐Gov't Hospital ☐Private  
 Hospital ☐Clinic  
 Address: \_\_\_\_\_  
☐Seaport/Airport ☐Private Laboratory ☐Public Laboratory

Patient No.	Full name	Age	Sex	Date of Birth	Complete Address	Admitted	Date Admitted/s een/ Consulted	Onset of illness	Stool culture result	Case classification	Outcome
Response Codes/ Instructions	First, middle and last name	D-days M-months Yr-Years	F M	mm/dd/yy	House #, Street, Purok/Barangay, City/Municipality, Province	Y-Yes N-No	mm/dd/yy	mm/dd/yy	P-Positive (specify organism) N- Negative ND-Not done U- Unknown	S-Suspect C-Confirmed	A-Alive D-Died (specify date) U- Unknown

**Suspected case:**

*Disease unknown in the area:* a person aged 5 years or more with severe dehydration or who died from acute watery diarrhea

*Disease endemic in the area:* a person aged 5 years or more with acute diarrhea with or without vomiting

*In an area with cholera epidemic:* a person with acute watery diarrhea with or without vomiting

**Probable case:**

Not applicable

**Confirmed case:**

A suspected case that is laboratory-confirmed

**Laboratory confirmation:** Isolation of *Vibrio cholerae* 01 or 0139 from stools in any patient with diarrhea

(Source: DOH, 2008)



## Annex D. Sample program for continuing education and advocacy

Sustainable Sanitation in East Asia - Philippines  
Seminar-Workshop on the Prevention and Control of STH Infections and Diarrheal Diseases  
(Venue)  
(Date)

### Objectives

1. To review the current status of STH infections and diarrheal diseases in the Philippines and the SuSEA sites
2. To discuss updates on diagnosis, treatment, prevention, and control of STH infections and diarrheal diseases
3. To discuss surveillance and monitoring of STH infections and diarrheal diseases
4. To formulate an action plan for the control, surveillance, and monitoring of STH infections and diarrheal diseases in the SuSEA sites

### DAY 1

8:00-8:30	Registration
8:30-9:00	Welcome Introduction of participants Expectations and rationale of seminar-workshop
9:00-10:00	SOIL-TRANSMITTED HELMINTH INFECTIONS Status in the Philippines and in the SuSEA sites
10:00-10:30	Break
10:30-11:30	Diagnosis and treatment Prevention and control
11:30-12:30	Models for control Surveillance and monitoring
12:30-1:30	Lunch break
1:30-2:30	DIARRHEAL DISEASES Status in the Philippines and in SuSEA sites
2:30-3:30	Diagnosis and treatment Prevention and control
3:30-4:00	Surveillance and monitoring Working break
4:00-7:00	WORKSHOP: Formulating an Action Plan Cocktails

### DAY 2

7:00	Breakfast
8:00-8:30	Management of Learning
8:30-10:00	Presentation of Action Plan for Dagupan City Open forum
10:00-10:30	Break
10:30-12:00	Presentation of Action Plan for Guiuan Open forum
12:00-12:30	Summary and next steps
12:30	Closing Remarks

### Participants

Local Government Unit  
City Health Officer  
Public Health Nurse  
Rural Health Midwife  
Rural Sanitary Inspector  
Department of Education  
Division Superintendent  
Medical Officer  
Nurses  
PTA Federation President



## Annex D1 - Sample action plan for prevention and control STH infections

### SUSTAINABLE SANITATION IN EAST ASIA - PHILIPPINES

#### Seminar-Workshop on the Prevention and Control of STH Infections and Diarrheal Diseases (Venue) (Date)

#### ACTION PLAN FOR PREVENTION AND CONTROL OF STH INFECTIONS

	EXPECTED OUTPUT	ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME	COST (in Philippine pesos)
<b>DIAGNOSIS</b>	Quality assurance and conformity with WHO and DOH standards in the diagnosis of STH	1. Training/refresher course for medical technologists on DFS, Kato Thick method, Kato-Katz method, FECT	UPM-NIH	August 12-13, 2010	50,000
	Proper use of techniques of parasitologic diagnosis in establishing baseline surveys, surveillance, and monitoring, among food handlers	2. Establishment and strengthening of referral network for parasitologic diagnosis by DepEd with local health units	DepEd MO and heads of local health units	August 15, 2010	-
		3. Strict implementation of DOH AO 2006-0001 (FECT for stool exam of food handlers)	SI and medical technologists	January 2011	-
<b>TREATMENT</b>	Reduction of the prevalence rate of STH infections to less than 30% and moderate to heavy intensity infections to 0% percent	1. Regular inventory of albendazole/mebendazole in terms of quantity and quality (no offensive odor)	Supply Officers of DepEd, CHO/RHU	Monthly or as needed	-
	Sustained 85% MDA coverage among pre-school and school children	2. Information campaign on the safety and efficacy of albendazole/mebendazole to health workers and parents	CIO, HEPO	August 1, 2010 and onwards	20,000
		3. Coordination of DepEd with the LGU through the CHO/RHU for a possible memorandum of agreement/ understanding on MDA, including protocols for handling of adverse events	Division Superintendent, Mayor	By EO of August 2010	-

## Annex D2 - Sample action plan for prevention and control STH infections

### SUSTAINABLE SANITATION IN EAST ASIA - PHILIPPINES

#### Seminar-Workshop on the Prevention and Control of STH Infections and Diarrheal Diseases (Venue) (Date)

#### ACTION PLAN FOR PREVENTION AND CONTROL OF STH INFECTIONS

	EXPECTED OUTPUT	ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME	COST (in Philippine pesos)
<b>PREVENTION AND CONTROL</b>	Reduction of STH morbidity by 25% by EO 2010 and 50% by EO 2013 (Local Sustain- able Sanitation Plan)	1. Periodic and regular monitoring of water potability	SI	Monthly and/or needed	40,000
		2. Strong advocacy for zero open defecation in the community through CLTS	Core CLTS Teams	On-going	20,000
	Institutionalize WASHED framework for comprehensive control and prevention	3. Integration of appropriate information on prevention and control of intestinal helminthiasis in school curriculum (Science and Health) with the emphasis on behavioral change and proper hygienic practices	DepEd	September 2010 onwards	20,000
		4. Supportive physical environment for hand washing, use of sanitary toilets, continuous use of foot wear	DepEd	September 2010 onwards	-
		5. Formulation and dissemination of key hygiene messages in local dialect through posters, advisories, tarpaulins, billboards	CHO/RHU, CIO	September 2010 onwards	30,000
		6. Implementation of sanitary laws and ordinances through issuance of sanitary permits to food establishments and school canteens	CHO/RHU, SI	August 1, 2010 onwards	-
		7. Regular mass deworming of target population; coordination with CSWO and DepEd to include OSY through ALS and program for street children respectively	CSWO, DepEd, CHO/RHU	August 1, 2010 onwards	100,000

## Annex D2 - Sample action plan for prevention and control STH infections

### SUSTAINABLE SANITATION IN EAST ASIA - PHILIPPINES

#### Seminar-Workshop on the Prevention and Control of STH Infections and Diarrheal Diseases (Venue) (Date)

#### ACTION PLAN FOR PREVENTION AND CONTROL OF STH INFECTIONS

	EXPECTED OUTPUT	ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME	COST (in Philippine pesos)
<b>SURVEILLANCE AND MONITORING</b>	Determination of prevalence rate of STH infections (done in December 2007)	1. Establishment of data bank of pre- schoolers and school children, including OSY	CHO/RHU, DepEd MO, Executive Assistant on Health Concerns of Mayor	August 1, 2010 onwards	30,000
		2. Follow-up parasitological surveys		December 2010	30,000
		3. Form a Technical Committee to come with a monitoring and evaluation checklist		October, 2010	20,000
<b>ADVOCACY/ RESOURCE MOBILIZATION</b>	Increasing awareness on prevention and control of STH infections with corresponding increase in funding allocation for various activities	1. Identification of launching day of local equivalent of War on Worms	DepEd as lead agency	August 1, 2010 onwards	30,000
		2. IEC and advocacy campaigns during meetings of the Local Health Board, Local School Board and PTA	CHO, DepEd	August 1, 2010 and onwards	-
		3. Tri-media campaign (print, radio, TV) on STH infections, and prevention as well as control	CIO	August, 15, 2010 onwards	20,000
		4. Lobbying for resources (financial/ in kind/ manpower) from local NGOs	LGU, SuSEA TWG	August 15, 2010	20,000
		5. Identification of Local Champion and recommendation for SP Resolution/ Ordinance with funding allocation regarding STH eradication	LGU, SuSEA TWG	Completed by the end of Dec. 2010	-

(Source: Dagupan LGU, 2010)



## Annex D2 - Sample action plan for prevention and control diarrheal diseases

### SUSTAINABLE SANITATION IN EAST ASIA - PHILIPPINES

#### Seminar-Workshop on the Prevention and Control of STH Infections and Diarrheal Diseases

(Venue)

(Date)

#### ACTION PLAN FOR PREVENTION AND CONTROL OF STH INFECTIONS

	EXPECTED OUTPUT	ACTIVITIES	PERSON RESPONSIBLE	TIME FRAME	COST (in Philippine pesos)
<b>DIAGNOSIS</b>	Reduction of mortality from diarrheal disease	1. Orientation and re-orientation of health care workers on the assessment of dehydration/diagnosis and rational use of diagnostic tests	Diarrheal Diseases Coordinator	August 1, 2010 onwards	20,000
<b>TREATMENT</b>	Prevention of undesirable effects of hypertonicity	1. Orientation and re-orientation of health workers on use of reformulated ORS and zinc supplementation in diarrhea case management	CDD Coordinator	First week of August, 2010	20,000
	Reduction of duration of acute and persistent diarrhea	2. Procurement of reformulated ORS and zinc supplements with prioritization for those who cannot afford	City Health Officer	Starting 3 <sup>rd</sup> quarter of 2010	50,000
	Reduction in treatment failure and death in persistent diarrhea	3. Regular inventory of ORS, zinc supplements and antibiotics for food and water borne diseases	Supply Officer	Monthly and as needed	-
<b>PREVENTION AND CONTROL</b>	Reduction in the incidence of morbidity and mortality from diarrheal diseases	1. Periodic and regular monitoring of water potability	IO	First week of August onwards	40,000
		2. Orientation on the 10 Golden rules to safe food preparation	HEPO		10,000
		3. Strong advocacy for zero open defecation in the community through CLTS	CLTS Core Team	Ongoing	20,000



	EXPECTED OUTPUT	ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME	COST (in Philippine pesos)
<b>PREVENTION AND CONTROL</b>		5. Health education and information dissemination on different preventive interventions e.g., early and exclusive breastfeeding, provision of adequate clean water and sanitation facilities, hand washing practices, improved feeding and food handling practices, measles immunization, Vitamin A supplementation	CHO/RHU	August 1, 2010 onwards	20,000
		6. Integrate diarrhea awareness prevention and control in school curriculum (Science and Health)	DepEd	September, 2010 onwards	20,000
<b>SURVEILLANCE AND MONITORING</b>	Appropriate and timely response to outbreaks	1. Orientation of health workers from the <i>Barangay</i> and other disease reporting units on PIDSR	RESU Personnel	September, 2010	30,000
		2. Updated collection of morbidity and mortality data from FHSIS on important food and water borne diseases (cholera, typhoid, dysentery, hepatitis A)	FHSIS Coordinator	Ongoing	-
		3. Training on epidemic preparedness, response and reporting	RESU/HEMS	November, 2010	20,000
<b>ADVOCACY/ RESOURCE MOBILIZATION</b>	Increased awareness on diarrhea prevention and control	1. Tri-Media campaign	IO	August 15, 2010	20,000
		2. Situationer for Local Chief Executive and SP Council on diarrhea with emphasis on economics of diarrhea burden	CHO/RHU		-
		3. DepEd Academic Olympics on diarrhea prevention and control e.g. poster/slogan contest	DepEd	October, 2010	30,000
		4. IEC and advocacy campaigns during meetings of the Local Health Board, Local School Board and PTA	DepEd		10,000

(Source: Dagupan LGU, 2010)



## **Annex E. Sample program for the training of medical technologists on the laboratory diagnosis of STH infections and diarrheal diseases**

Sustainable Sanitation in East Asia - Philippines  
Diagnosis of Intestinal Parasitoses for Medical Technologists  
(Venue)  
(Date)

### Objectives

1. To describe the epidemiology and control of intestinal parasitoses in the Philippines
2. To discuss appropriate diagnostic techniques for intestinal parasitoses
3. To perform standard stool examination for diagnosis and surveillance of STH infections
4. To discuss surveillance and monitoring of STH infections in the community

### DAY 1

8:00-8:30	Registration
8:30-9:00	Pre-test (theoretical and practical)
9:00-10:00	Welcome Introduction of participants Epidemiology and control of intestinal parasitoses in the Philippines
10:00-10:30	Break
10:30-12:00	Diagnosis of intestinal helminth infections
12:00-1:00	Lunch break
1:00-2:30	Diagnosis of intestinal protozoan infections
2:30-3:00	Break
3:00-5:00	Laboratory work: intestinal helminths

### DAY 2

8:00-10:00	Laboratory work: intestinal protozoans
10:00-12:00	Surveillance and monitoring of STH infections in the community
12:00-1:00	Lunch break
1:00-3:00	Practice laboratory unknown
3:00-4:30	Post-test (theoretical and practical)
4:30-5:00	Feedback and closing remarks Awarding of certificates

### Participants

Medical Technologists from:  
Center for Health Development  
Provincial Health Office  
City Health Office, Rural Health Unit  
Regional / Provincial / City Hospitals



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## DEFINITION OF TERMS

**Adverse drug reaction** refers to noxious and unintended responses to a medicinal product related to any dose. Responses to medicinal products mean that a causal relationship between a medicinal product and an adverse event is at least a reasonable possibility.

**Adverse event** refers to any untoward medical occurrence in a patient or clinical investigation subject administered a pharmaceutical product which does not necessarily have a causal relationship with the treatment.

**Coverage** refers to the proportion of the target population with access to an intervention.

**Dehydration** refers to a loss of a large amount of water and salt from the body.

**Diarrhea** refers to the passage of unusually loose or watery stools at least three times within a 24 hour period.

**Dysentery** refers to the passage of unusually loose or watery stools with the presence of blood.

**Filariasis** refers to infection caused by *Wuchereria bancrofti* or *Brugia malayi*.

**Helminths** refer to parasites commonly referred to as worms. The group includes cestodes, nematodes and trematodes. Cestodes include the beef and pork tapeworms, the largest of the helminths. Nematodes include the roundworm *Ascaris lumbricoides*, the whipworm *Trichuris trichiura* and the hookworms *Necator americanus* and *Ancylostoma duodenale*. Trematodes include *Schistosoma japonicum*, among other schistosomes.

**Helminthiasis** refers to any form of disease that accompanies a helminth infection. The onset and severity of detectable morbidity is related to the number of worms present.

**Morbidity** refers to detectable and measurable consequences of a disease.

**Persistent diarrhea** refers to the passage of unusually loose or watery stools which lasts for 14 days or longer.

**Preschool-age children** refer to all children between one and five years of age.

**Prevalence of infection** refers to the proportion of the population infected with a specified agent.

**Preventive chemotherapy** refers to administration of drugs, either alone or in combination, to an entire group of people without prior diagnosis of current infection as a public health tool against helminth infections.

**Reformulated ORS** refers to a new formula with reduced concentration of glucose and salt (NaCl) to avoid the possible effects of hypertonicity of net fluid absorption.

**Sanitation** refers to the hygienic and proper management, collection, transport, disposal, or reuse of human excreta (feces and urine) and community liquid wastes to safeguard the health of individuals and communities. It is concerned with preventing diseases by hindering pathogens, or disease-causing organisms, found in excreta and wastewater from entering the environment and coming into contact with people and communities. This usually involves the construction of adequate collection, transport, treatment, and disposal or reuse facilities and the promotion of proper hygiene behavior so that facilities are effectively used at all times.

**School-age children** refer to all children between six and 12 years of age regardless of enrolment status.

**Selective treatment** refers to giving drugs to an individual based on diagnosis of current infection.

**Serious adverse event** refers to an event which occurred after drug intake that is fatal, life-threatening, disabling or incapacitating, or requiring hospital admission.

**Soil-transmitted helminth (STH) infections** refer to infections caused by *Ascaris lumbricoides*, *Trichuris trichiura*, and the hookworms *Ancylostoma duodenale* and *Necator americanus*.

**Targeted mass treatment** refers to giving drugs to a specific group in the community defined by age or other social characteristic irrespective of the infection status.

**Zinc** refers to an essential mineral that stimulates the activity of approximately 100 enzymes.

**Zinc deficiency** refers to zinc levels lower than 7 µmol/L in serum or 5 µmol/L in plasma. It is one of the major risks to child health, and 10% of which is secondary to diarrhea.