



ENVIRONMENTAL HEALTH PROJECT

# Advancing Environmental Health for Disease Prevention: Past Experiences and Future Priorities

Lessons Learned from EHP 1999-2004

Environmental Health Project  
Contract HRN-I-00-99-00011-00  
is sponsored by the  
Office of Health, Infectious Diseases  
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Washington, DC 20523

LESSONS LEARNED

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October 2004

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**In memory of**

**John H. Austin, P.E., Ph.D.**

**February 22, 1929 – August 17, 2004**



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# Preface

With publication of these lessons learned, we bring closure to USAID's Environmental Health Project (EHP).

EHP II, initiated in June 1999, was the second of two five-year technical assistance projects under the direction of USAID's Bureau for Global Health, Office of Health, Infectious Diseases and Nutrition. EHP served as the primary vehicle for USAID to advance the state of the art in prevention-oriented, environmental health and provided USAID Bureaus and Missions worldwide with a broad range of support for programming environmental health activities. The lessons and experience of EHP II build on and refine what was learned from the predecessor EHP I and Water and Sanitation for Health (WASH) projects. Over more than two decades, the opportunities for learning have come from succeeding and sometimes from falling short. In addition, these experiences provide a strong base for USAID's future programming and next steps in environmental health.

In diarrheal disease, EHP's principal lessons emerged from its central challenge: how to promote prevention given the prevailing paradigm that focused on case management and oral rehydration for children with diarrhea. EHP's response was to promote the integration of hygiene with other child health activities by developing the Hygiene Improvement Framework. For malaria, EHP's challenge was to explore the possibilities of integrated vector management (IVM) within a program context that focused on insecticide-treated bednets and case management. EHP identified an appropriate niche for IVM and worked with USAID to successfully champion IVM approaches at the policy level.

EHP was also a key USAID vehicle for exploring new and innovative program areas. A good example has been the integration of population-health-environment (PHE) activities at field level, most notably in sensitive forest regions of Madagascar. Urban issues continue to grow in importance in many USAID-assisted countries. EHP focused on both advancing the state of the art in urban environmental health, such as the special problems of addressing sanitation in small towns in Latin America or urban agriculture's impacts on malaria in African cities, as well as looking at the overall urban health agenda more broadly. Urban health collaborations in the ANE region, with field work in India and Egypt, has been especially informative and laid the groundwork for future USAID programming.

A lesson cutting across the range of EHP experiences was the crucial importance of working in partnership. The lessons presented here were learned through various types of collaborative arrangements with a wide array of partners, including international organizations, NGOs, other donors, universities, and the private sector.

*Advancing Environmental Health for Disease Prevention: Past Experiences and Future Priorities* is the culmination of five years of ideas, skills and hard work by all EHP staff, consultants and partners, past and present, notably including Masee Bateman, EHP Project Director from June 1999 to January 2002. The Lessons Learned Papers were prepared by Siddharth Agarwal, Eugene Brantly, Sarah Fry, Eckhard Kleinau, May Post, Odile Randriamananjara, Fred Rosensweig, and Jennifer Talbot, with editorial and design assistance from Milton Stern and Abdulzatar Kuku. We also acknowledge Steven Nakashima and Pandu Wijeyaratne for their contributions.

Thanks are also due to Craig Hafner and John Gavin of the Environmental Health Project, and Matt Lynch, Merri Weinger and Stephanie Wilcock of USAID, who reviewed drafts and provided useful comments.

All of us at USAID and EHP are particularly indebted to the late Dr. John Austin for his long-term support of EHP's work. This volume is dedicated to his memory.

John Borrazzo

Environmental Health Team Leader  
Bureau for Global Health, USAID  
Washington, DC

Sandra Callier

EHP Project Director  
Arlington, Virginia

# Introduction

— May Post, Information Center Coordinator

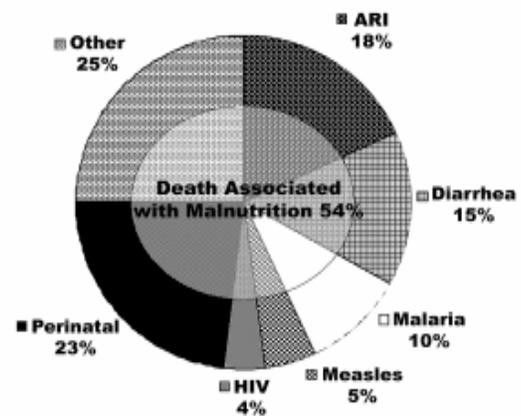
WHO estimates that environmental risk factors account for 25% of the overall burden of disease, and 30% of that burden falls on children under-five, particularly in developing countries.<sup>1</sup> Of the many diseases and hazards that fall within the purview of environmental health, two of the major ones related to child mortality and morbidity are diarrheal diseases and vector-borne diseases (malaria).

According to WHO's Global Burden of Disease 2002 estimates, diarrhea accounts for nearly 1.6 million deaths or 15% of under-five mortality each year in developing countries.<sup>2</sup> Based on a June 2003 Lancet article, the number may be as high as 2.3 million.<sup>3</sup> Still, a review of 60 studies of diarrhea morbidity and mortality published from 1990 to 2000 concluded that diarrhea causes 2.5 million deaths per year, although morbidity remains relatively unchanged.<sup>4</sup> Despite different methods and sources of information, each successive review of the diarrhea burden over the past decades has demonstrated relatively stable morbidity despite the decline in mortality.

Similarly, among the 10.5 million children under-five who died worldwide in 2002, over a million deaths or 10% of all under-five deaths were due to malaria.<sup>5</sup> Malaria accounts for one in five childhood deaths in Africa, and the consequences of malaria such as anemia, low birth weight and neurological problems frequently compromise the

health and development of millions of children worldwide. For example, according to the 2001 RBM Fact Sheet, of the more than 500,000 African children who develop cerebral malaria each year, 10%-20% die, and approximately 7% are left with permanent neurological damage. Likewise, chronic anemia as a result of malaria, adversely affects a child's growth and development.

## Proportional Mortality Among Under Fives Worldwide 2002



Sources: For cause-specific mortality: Evidence and Information for Policy/WHO Child and Adolescent Health and Development, 2002; For malnutrition: Pelletier DL, et al. *AMJ Public Health* 1993;83:1130-3

## About EHP

The Environmental Health Project (EHP) began a second five-year contract in June 1999, under the direction of the Office of Health, Infectious Diseases and Nutrition in USAID's Bureau for Global Health (BGH/HIDN). EHP provided access to a broad range of capabilities for missions and bureaus wishing to include environmental health preventive components, while advancing the state-of-the-art of these components.

<sup>1</sup> Briggs D. 2003. Making a Difference: Indicators to Improve Children's Environmental Health. World Health Organization.

<sup>2</sup> World Health Organization. 2003. *World Health Report 2003: Shaping the future*

<sup>3</sup> Black Robert E, Morris Saul S, Bryce Jennifer. 2003. *Where and why are 10 million children dying every year?* Lancet 2003; 361:2236-3

<sup>4</sup> Kosek M., Bern C., Guerrant R.L. 2003. *The global burden of diarrheal disease, as estimated from studies published between 1992 and 2000.* Bulletin of the World Health Organization 81(3):197-204.

<sup>5</sup> World Health Organization. 2003. *World Health Report 2003: Shaping the future.*

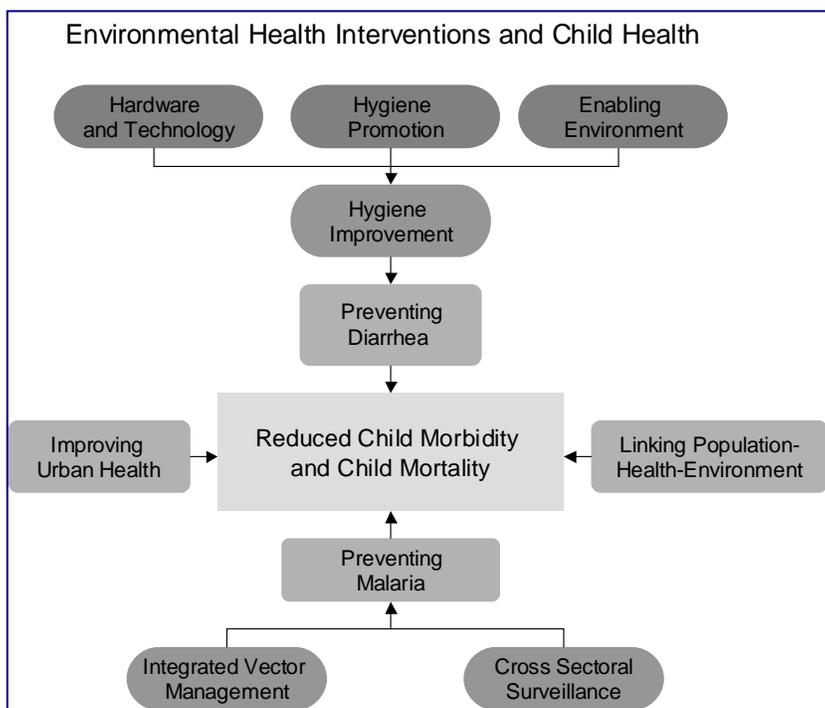
EHP had two objectives. The principal objective was to reduce mortality and morbidity in children under-five by improving environmental conditions or reducing exposure to disease agents associated with infectious diseases of major public health importance. The second objective was to provide a mechanism for access by diverse interests within USAID to a broad range of expertise in environmental health.

## Focus Areas

### 1. Hygiene Improvement for Diarrhea Prevention

Child mortality from diarrhea has declined by almost two-thirds from 4.6 million deaths in 1980. Yet, a parallel reduction in diarrhea-related morbidity has not been seen. Lack of safe water, basic sanitation and hygiene may account for as much as 88% of the disease burden due to diarrhea. Over the past two decades, USAID and other organizations such as UNICEF's support of child survival programs has contributed to the reduction of childhood diarrhea mortality through case management and use of oral rehydration in combination with strategies to improve host resistance and improved nutrition. To facilitate further progress in reducing overall diarrhea morbidity, more attention will need to be paid to diarrhea prevention through hygiene improvement interventions, which have been demonstrated to be effective in terms of public health impact.

Studies have shown that hygiene improvement interventions such as improved water, sanitation and hygiene have resulted in a 30%-50% reduction in the burden of diarrheal diseases.<sup>6</sup>



The Bellagio Child Survival Study Group also includes water/sanitation/hygiene as one of the top ten proven preventive interventions for deaths of under-fives.<sup>7</sup>

Based on these findings, EHP developed the Hygiene Improvement Framework (HIF)—a comprehensive approach to diarrhea prevention that addresses three elements: improving access to hardware (water, sanitation, and household technologies); hygiene promotion (promotion of hygiene behaviors such as handwashing, safe excreta disposal, and safe household water management); and supporting an enabling environment (policy improvement, partnerships, and institutional strengthening).

Focus Countries: Benin; DR Congo; Dominican Republic; Nepal; Nicaragua; Peru; West Bank/Gaza; Zambia

<sup>6</sup> Esrey, S.A., Potash J.B., Roberts L., Shiff C. 1991. *Effects of Improved Water Supply and Sanitation on Ascariasis, Diarrhoea, Dracunculiasis, Hookworm Infection, Schistosomiasis, and Trachoma*. Bulletin of the World Health Organization 69 (5): 609-621; Curtis V., Cairncross S. 2003. *Effect of washing hands with soap on diarrhoea risk in the community: a*

*systematic review*. Lancet Infectious Diseases, 3(5): 275-281; World Health Organization. 2003. *World Health Report 2003: Shaping the future*.

<sup>7</sup> The Bellagio Study Group on Child Survival. 2003. *Knowledge into action for child survival*. Lancet, 362(9380): 323-27.

## **2. Prevention and Control of Malaria and Vector-borne Diseases**

USAID is committed to reducing the burden of malaria. Since the start of USAID's Infectious Disease Initiative in 1998, the Agency has significantly stepped up its efforts in the battle against malaria. USAID is working in close collaboration with the Roll Back Malaria partnership and others to reduce the devastating impact of malaria on developing countries, particularly in Africa, where 90% of malaria deaths occur. An objective of USAID in its battle against malaria is to increase access to technologies for malaria prevention.

EHP worked with national malaria control programs to improve surveillance and vector management for prevention and control of malaria and other vector-borne diseases. To help malaria control personnel understand the patterns of transmission and target their interventions for greatest impact, EHP's cross-sectoral surveillance (XS) activities focused on development of methods that collect, integrate and analyze various types of information (epidemiological, environmental, entomological and demographic). Related to vector management, EHP promoted integrated vector-management (IVM) to help ministries of health assess the effectiveness of selected vector control methods and identify appropriate integrated strategies including community-based approaches.

Focus Countries: ANE Region; Eritrea; Mozambique; Nepal; Uganda; Zambia

## **3. Linking Population, Health and the Environment**

Recognizing the nexus between population and the environment as crucial for achieving sustainable development and biodiversity conservation, USAID supported the Voahary Salama Association (VS), an NGO umbrella organization, that implements the integrated population, health and environment (PHE)

program along Madagascar's forest corridors. EHP, in collaboration with other partners, played a major role in developing institutional and technical capacity of local NGOs to implement integrated activities in 160 Malagasy communities covering a population of 120,000 between 2000 and 2004. Systematic monitoring and evaluation under EHP's direction showed that integrated programs can be very effective at relatively low costs. Substantial improvements of key PHE indicators overall or in specific intervention areas were seen in contraceptive prevalence rates, immunization coverage, access to safe water and basic sanitation, and the practice of less destructive natural resource management methods. Health indicators such as malnutrition and diarrhea prevalence, however, remained high with poverty and natural disasters from cyclones as important contributing factors.

Focus Country: Madagascar

## **4. Improving Health for the Urban Poor**

Two significant efforts have been at the core of EHP's urban health portfolio: the USAID/India Urban Slum Child Health Program and the USAID/Asia Near East (ANE) Bureau Urban Health Initiative. In India, EHP has conducted slum-based assessments and child health programs through local NGOs in four cities and assisted the Government of India in developing national level strategies and models for health programs for the urban poor.

For the ANE initiative, EHP conducted a literature review of existing studies on urban slum child health, implemented a pilot urban poor health program in Cairo, and organized a regional urban health workshop in India for USAID missions in ANE to raise awareness of urban health issues, share experiences and advocate for increased urban health programming.

Focus Countries: Egypt; India

## Key Lessons Learned

EHP has sought to integrate environmentally-related prevention measures with child health programs and to advocate for the inclusion of hygiene/health activities in water supply and sanitation activities. Similarly, EHP has sought to improve malaria control and prevention programs; worked with sector-specific projects in health, population and natural resource management to foster greater collaboration and increase their effectiveness and sustainability; and raised awareness of the health issues of urban poor children and provided models for urban programming.

The key lessons learned from the EHP focus areas, based on five years of EHP experience (1999–2004) are as follows:

- √ The Hygiene Improvement Framework is a flexible tool that allows program planners and managers to use single or multiple components in different programmatic contexts—child health or primary health care programs or water and sanitation activities or other programs—to achieve results.
- √ In areas prone to epidemics of malaria and other vector-borne diseases, understanding the local distribution of the disease and its relation to environmental and demographic factors will help public health officials improve the prevention and control activities they direct.
- √ Integrated Vector Management is now the accepted technical framework for vector control programs for malaria and other vector-borne diseases.
- √ Integrated population, health and environment programs that are implemented through local NGOs in partnership with donor funded projects can be very effective and achieve results in multiple sectors at relatively low costs.

- √ Focusing child health interventions in urban settings is crucial. Evidence shows that the health status of children in urban poor settings is as bad and often worse than in rural areas. Urban poor children under-five suffer more and die more often from diarrhea and acute respiratory infections than rural children.

## About the Lessons Learned Papers

*Advancing Environmental Health for Disease Prevention: Past Experiences and Future Priorities* is a collection of Papers that provide a concise overview of end-of-project lessons learned from five years (1999–2004) of EHP's work related to hygiene improvement, malaria control and prevention through integrated vector management and cross-sectoral surveillance, linking population, health and environment and improving health for the urban poor.

The lessons are approaches and practices that offer ideas about what works in a given situation and have implications for future programming. Lessons are often “lessons from” a specific activity, and not all lessons may be universal in scope and application. The intended audience for Lessons Learned is USAID, international organizations, PVOs and NGOs working in environmental health programming. The Lessons Learned Papers are based on activity-specific background papers and reports written by EHP Activity Managers and the Information Center Staff.

# Hygiene Improvement for Diarrhea Prevention

- Eckhard Kleinau, Senior Technical Director,
- May Post, Information Center Coordinator
- Fred Rosensweig, Activity Manager

Child mortality from diarrhea has declined by almost two-thirds from 4.6 million deaths in 1980.<sup>8</sup> Yet, a parallel reduction in diarrhea-related morbidity has not been seen, which seriously impacts children’s health, nutritional status and learning abilities. Lack of safe water, basic sanitation and hygiene may account for as much as 88% of the disease burden due to diarrhea. In 2000, 1.1 billion people lacked access to safe drinking water, and 2.4 billion people did not have access to basic sanitation.<sup>9</sup> To facilitate further progress in reducing the overall morbidity associated with diarrhea, more attention will need to be paid to hygiene improvement interventions, which have been demonstrated to be effective in terms of public health impact. Hygiene improvement (HI) is defined as a comprehensive approach to prevent childhood diarrhea through a focus on improving key hygiene behaviors, especially ensuring safe household drinking water, proper hand hygiene, and effective use of sanitation.

Over the past two decades, USAID and other organizations such as UNICEF’s support to child survival programs has contributed to the mortality reduction through case management of diarrhea and use of oral rehydration, in combination with improved nutrition. Based on available

<sup>8</sup> WHO estimates for 2002 were 1.6 million deaths of children under-five for diarrhea but the number may be as high as 2.3 million according to a June 2003 Lancet article.

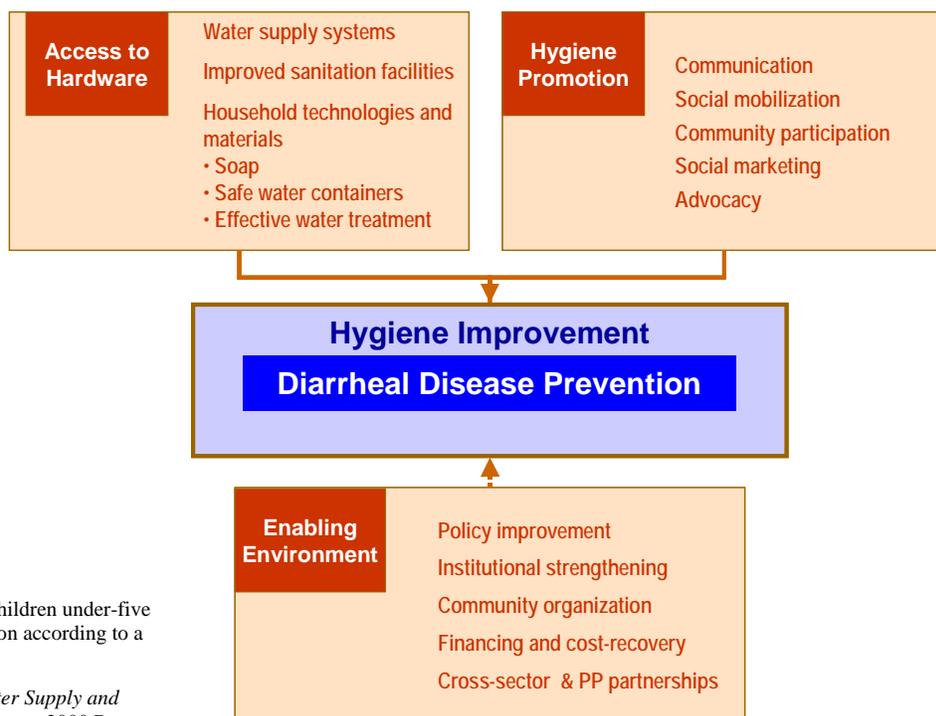
<sup>9</sup> WHO/UNICEF *Joint Monitoring Programme for Water Supply and Sanitation*. Global Water Supply and Sanitation Assessment 2000 Report

scientific evidence, diarrhea prevention through hygiene improvement was added as an effective approach for reducing diarrhea morbidity. At the center of EHP’s program is the Hygiene Improvement Framework (HIF) (see diagram below)—a comprehensive approach to diarrhea prevention that addresses three elements: improving access to hardware (water, sanitation, and household technologies); hygiene promotion (promotion of hygiene behaviors such as handwashing, safe excreta disposal, and safe household water management); and supporting an enabling environment to ensure the sustainability of hygiene improvements (policy improvement, partnerships, and institutional strengthening).

## Lessons Learned

The lessons learned are related to EHP’s experience in hygiene improvement for diarrhea prevention—they are approaches and practices that offer ideas about what works in a given situation and have implications for future

### The Hygiene Improvement Framework



programming. The intended audience is USAID, international organizations, PVOs and NGOs working in environmental health programming. The lessons are organized under four categories: programmatic context; designing and implementing hygiene promotion activities; creating an enabling environment; and monitoring and evaluation.

## Programmatic Context

HI interventions can be implemented in different program settings. All HIF components can be fully integrated into health and other program platforms or selectively applied. Lessons learned from implementing HI in different programmatic contexts are discussed below.

- √ **Key Lesson:** The HIF is a flexible tool that allows program planners and managers to use single or multiple HIF components in different programmatic contexts to achieve results.

The key lesson from EHP is the flexibility and utility of the HIF. The flexible approach to the use of the HIF by program planners allows adaptation to: different program contexts (child, maternal, primary health care and other programs such as urban health and integrated population, health and environment); specific country circumstances; and different budget constraints.

For example, EHP added a sanitation and hygiene component to community child health programs in Nicaragua and Peru. In Madagascar, hygiene was incorporated into an effort to integrate population, health, and environment. In the West Bank, hygiene was an essential component of a rehabilitation activity in response to an emergency situation. And in the DRC, hygiene was added to a broad-based public health project. Each of these has achieved measurable improvements in essential hygiene practices or hardware or both, but through very different programmatic approaches. Since this lesson is the overarching lesson in this document, there is

really not one single program that shows the flexibility of the HIF. Rather, all hygiene improvement activities contribute to this lesson.

- √ **Lesson:** Improved hygiene behaviors with a reduction in childhood diarrheal disease can be achieved when all three components of the hygiene improvement framework are in place.

In examining the implementation of hygiene improvement programs in child health, water supply and sanitation (WS&S) and other areas, EHP has found that programs that include all three HIF components can achieve significant results.

The **Dominican Republic** (DR) program (2000-2004) successfully improved hygiene behaviors and reduced childhood diarrhea in nine communities in the Hato Mayor municipality. The program used a comprehensive hygiene improvement approach that included promoting healthy behaviors, access to hardware (construction of infrastructure following Hurricane Georges), and strengthening the enabling environment (working with the national water authority to establish decentralized community management of water supply and sanitation systems). A decrease in diarrhea prevalence for children under-5 from 27% at baseline (December 2001) to 13% at final survey (March 2004) was reported. Observed use of soap during handwashing increased from 59% to 69%, and there was also an increase in sanitary disposal of children's excreta (in latrines) from 28% at baseline to 67% at final survey.

- √ **Lesson:** Hygiene improvement interventions can be effectively integrated into ongoing programs—such as child health, primary health care, or other programs.

Hygiene improvement interventions have been part of primary health care (PHC) even before the 1978 Alma Ata Conference. The advent of

selective PHC and child survival shifted the focus to oral rehydration therapy and immunization, and with the introduction of Integrated Management of Childhood Illnesses (IMCI) in the early 1990s, interventions became more health facility-centered. However, there has been renewed interest, especially among NGOs, in community-based child health, i.e., the community component of IMCI (C-IMCI). Within this new paradigm, EHP has been able to effectively integrate hygiene promotion into ongoing programs in collaboration with PVO, NGO and partner organizations.

SANRU III is a five-year, \$25 million, rural Primary Health Care (PHC) project in the **Democratic Republic of the (DR) Congo**. The C-IMCI strategy developed by SANRU III provided the framework to promote and extend PHC to rural communities. EHP worked with SANRU III to revitalize the network of zonal water and sanitation coordinators established under SANRU I/II in the 1980s, while increasing program emphasis on hygiene promotion. Linking hygiene promotion to C-IMCI was a major factor in hygiene promotion gaining acceptance in this integrated PHC project. Additionally, by actively incorporating hygiene behaviors into C-IMCI, a wider audience was reached than when using facility-based channels.

Over a five-year period, EHP implemented a program in **Madagascar** linking population-health-environment (PHE) activities to demonstrate synergies resulting from integrated programming. Hygiene promotion, point-of-use water treatment, and small-scale water supply systems were integrated into ongoing NGO activities that were primarily focused on voluntary family planning or improved agriculture. Natural resource management activities provided a useful entry point for incorporating activities, mostly to populations who would not be easy to reach otherwise. The activities covered 120,000 people in 160 communities and were implemented by a consortium of NGOs and supporting

organizations under Voahary Salama (VS), the NGO umbrella organization. Results from an impact evaluation conducted by the VS Association showed that contraceptive prevalence rates increased from 12% at baseline to 17% overall, and immunization rates for fully immunized children increased to nearly 60%. Additionally, access to improved water sources rose from 19% to 24% overall in intervention areas and more than doubled in some NGO supported villages. Similarly, access to improved sanitation facilities increased from 52% to 55% overall, and by almost 20% in one area. Handwashing with soap was not assessed at baseline, but was very low with approximately 6% at any of the five critical times during the impact survey.



Accessibility to hardware is important to hygiene improvement. Women in DR Congo make use of a community water source .

Partnering with PLAN International, the **EHP-Pan American Health Organization (PAHO) C-IMCI program in Nicaragua and Peru** integrated hygiene promotion activities into the IMCI context and expanded the IMCI focus from a facility to a community-based approach. The strategy was modeled after a successful hygiene promotion approach used in the Dominican Republic (DR), where EHP developed and field-tested a methodology to integrate hygiene promotion into existing C-IMCI modules for diarrheal disease prevention. This methodology assumes that the activities most likely to result in improved health outcomes are those that focus on

participants' behaviors. The emphasis was on community and household practices and preventive behaviors such as handwashing, safe excreta disposal and safe water (point-of-use water treatment and safe storage at the household level). The approach emphasized strong formative research and behavioral trials to identify feasible improved practices (Trials of Improved Practices (TIPS)) and included extensive training-of-trainers sessions as well as community health worker training. EHP assisted in the training and materials development for NGO partners working in high diarrheal disease incidence districts. A final survey to measure behavior change in the communities is planned.

## Designing and Implementing Hygiene Promotion Activities

EHP has focused on the design and implementation of hygiene promotion interventions at scale. While much remains to be learned related to programming hygiene interventions at scale, EHP has learned lessons in designing and implementing hygiene improvement programs that offer promise.

- √ **Lesson:** Local institutions and organizations can scale-up hygiene improvement activities with direct supervision, knowledge and skill building, provided they have a clear mandate and implementation resources.

The Millennium Development Goals set ambitious targets aimed at reducing the proportion of people without access to water and basic sanitation by 50% by the year 2015. To achieve these targets, rapid scale-up of programs is essential. There are a range of factors that must be taken into account in going to scale—an important one is to develop the capacity of local institutions.

The strategy for developing local capacity to implement hygiene promotion activities varies according to the situation. In the **Dominican**

**Republic (DR)**, EHP worked with 16 local NGOs and the capacity building approach included several key elements: training a team of PVO trainers; implementing a systematic hygiene promotion methodology; developing community-specific educational materials; building institutional capacity for hygiene promotion through the national NGO network (e.g., through workshops, materials dissemination). In the **DR Congo**, unlike the DR, EHP worked with a single organization—SANRU—with a very large outreach. Being “practical and realistic” and “thinking big from the start” was important for scale-up of the DR Congo activity. Working with a local organization that has the infrastructure to scale-up to reach 8 million people made the task much easier.

- √ **Lesson:** Hygiene behavior change has a better chance of becoming sustainable if the community is actively involved.

While EHP advocates a range of strategies for effective hygiene promotion, EHP generally places strong emphasis on local participation. This participation can take many forms including working through existing community committees and/or consultation with community members in focus groups, individual interviews, and public meetings. Community engagement has two overall benefits. First, it informs the process and ensures that the strategy is on target and grounded in the reality of the community. Second, it enhances local ownership and increases the chances for success and scale-up.

The **Benin** GESCOME (*Gestion Communautaire de Santé Environnementale*—Community Management of Environmental Health) project (1999-2001) showed that, with minimum external supervision, local communities could successfully establish and manage effective, decentralized, autonomous decision-making structures related to diarrheal disease prevention in selected medium-sized towns in Benin. The activity resulted in much-wanted infrastructure such as public latrines and water points. In addition,

“participatory community health communication,” an innovative approach to cooperative learning, ensured proper use of latrines in the communities and led to improved hygiene behavior, such as handwashing after latrine use, covering food, covering water jars, and improving the general cleanliness of the environment. There was also a change in the community’s understanding of diarrhea’s causes and an increase in participatory decision-making. In addition, coalitions between local government, civil society, and communities led to an increase in participatory decision-making and health problem solving.

- √ **Lesson:** Working through existing community structures is a sustainable solution to effectively convey key hygiene promotion messages in circumstances where formal systems barely exist, communities are poor and many other public health priorities compete for resources.

Creating new structures takes time and often is not successful. Existing structures have already established their credibility and developed their own capacity to be a force for change in the community. In general, EHP sought to work through existing community structures.

The **DR Congo**/SANRU hygiene promotion activity reached an estimated target population of 375,000. A key success factor of the activity was tapping into existing community structures—the church and schools as well as community development committees and mothers’ clubs—to convey hygiene messages. Priests and teachers were trained as “institutional relays” and mothers were trained to work on “volunteer relays” to promote hygiene messages. While time did not allow for a complete post-intervention survey, results from a mini knowledge, practice and coverage (KPC) survey implemented by the School of Public Health showed the following in SANRU-intervention zones: households where only adults have access to stored water (safe

water management) increased from 69.6% to 88.6%; households with access to an improved water supply increased from 30.1% to 50.1%; households that wash their hands correctly and air dry them increased from 31.3% to 33.3%; households that have latrines rose from 73.8% to 85.7%; and households that dispose children’s feces immediately in a latrine increased from 72.0% to 91.2%.



A basic but functional toilet facility at a primary school in a Malagasy village

- √ **Lesson:** The HIF can also be applied in a crisis or natural disaster situation. While the time-frame and pressures for project completion are compressed in these situations, the principles of project planning and implementation remain the same.

In the aftermath of Hurricane Mitch, USAID allocated nearly US\$10 million over a 28-month period for the reconstruction effort in **Nicaragua**. Grants were given through EHP to a group of PVOs. EHP’s PVO partners—Action Against Hunger, the Adventist Development and Relief Agency, Alistar/Raya Ka Laya, CARE, Plan International, Save the Children/USA—worked together with their Nicaraguan partners and

reached 215,000 beneficiaries. Effective programming elements for the Nicaragua program included: prior knowledge of key institutions, issues and policy to inform the strategy design; clear and focused objectives and time-lines; partnerships with PVO grantees and local organizations; proactive management; and constant monitoring of targets throughout the program.

In the **West Bank**, USAID through EHP provided substantial aid related to infrastructure and management of water supply and sanitation services. The HIF was applied in preliminary activity planning including the implementation of environmental health assessments. Based on assessment findings, steps were initiated to enhance health gains to 170,000 people living in 50 villages in the West Bank— which included implementing a series of TIPs on handwashing, home management of diarrhea in children-under-5, and improved household level-water storage and disinfection practices. Due to the prevailing political situations, the project focuses on simple, community-based interventions that could potentially lead to a reduction of child diarrhea and intestinal parasites. Partnerships between relevant ministries and government agencies, and in particular the Ministry of Health, have also been formed and serve as the basis for supporting IMCI roll-out in the country.

Although working under difficult conditions required intensive and detailed planning and management procedures, these projects support the lesson that, even in areas of war and crisis and natural disaster, HIF components can be applied and project activities are similar to those implemented under non-disaster, non-crisis situations.

## Creating an Enabling Environment

Hygiene improvement interventions cannot be scaled up or be sustainable without a supportive enabling environment that includes policy improvement, institutional strengthening and

partnerships. EHP worked extensively on three specific enabling environment issues: national sanitation policies; improving sanitation in small towns; and developing institutional support mechanisms (ISMs) to provide backup support to community-managed rural water supply and sanitation systems after they are operational. Each enabling environment issue was studied extensively, methodologies were developed and applied in the field, and guidance documents produced. The key lessons are presented below.

- √ **Lesson:** National sanitation policies are critical to creating an enabling environment to encourage increased access to sanitation services. Without a sound policy framework, scaling up sanitation is difficult.

In the past few years, policy makers have recognized that a key constraint to replicating and scaling up successful pilot programs has been unclear, contradictory or nonexistent national sanitation policies within which public and private sector organizations operate. For scale-up to be successful, countries have become increasingly aware that a coherent set of national sanitation policies is needed that promotes the importance of sanitation, sets priorities, and provides the basis for action. To address this issue, EHP developed the Guidelines for Assessing National Sanitation Policies.

- √ **Lesson:** Improving sanitation in small towns at scale requires a long-term perspective and supportive national policies that provide financing mechanisms, appropriate technical norms and standards, and a decentralized system that puts the small town as the primary decision maker.

Over two years, EHP explored the sanitation issue in small towns in Latin America and concluded that the primary constraints to improving sanitation in small towns are as follows: lack of resources for financial

investment in wastewater collection and treatment; lack of demand for sanitation; limited institutional capacity; and a bias among engineers towards more conventional wastewater collection and treatment. To address these constraints, EHP designed a strategy and a practical methodology, and field-tested the methodology for sustainable small town sanitation services in Jamaica, Ecuador and Panama.

- √ **Lesson:** The sustainability of community-managed rural water supply and sanitation systems requires backup support after the systems are operating.

Increasingly, donors and governments have recognized the limits of community management and that some form of ongoing support is needed to ensure sustainability. In response to this problem, EHP identified and documented case studies of four successful models to provide post-construction support and developed a guidance document for establishing institutional support mechanisms (ISMs) to support community-managed systems.

- √ **Lesson:** Partnerships are crucial in creating an enabling environment. Partnerships provide added value and an opportunity to leverage investments in hygiene promotion and achieve complementary benefits and gains.

Under the **Central American Handwashing Initiative** (1996-99), USAID through EHP and the Basic Support for Institutionalizing Child Survival (BASICS) projects was the catalyst that created a Public-Private Partnership (PPP) among four soap companies, the ministries of health from Guatemala, El Salvador, and Costa Rica, and numerous NGOs and development organizations. The PPP handwashing campaign involved the media, social mobilization, and hygiene promotion programs implemented through PVOs and soap companies to reach communities and schoolchildren throughout Central America. 450,000 schoolchildren were

reached in 2001 alone. The Partnership: resulted in a 50% increase in handwashing with soap among mothers and a 4.5% reduction in diarrheal disease prevalence among children under-five; leveraged significant private sector resources; and sustained the private sector's involvement in social programs. Based on the success of the Central American Handwashing Initiative, other PPP initiatives are being implemented in **Peru** and **Nepal** with EHP support. In PPPs, the soap industry (private sector) stands to gain by selling more soap while the public agencies move toward the desired objective of improved hygiene practices and a reduction in diarrheal diseases.

- √ **Lesson:** Partnerships facilitate transfer of skills, sharing of lessons learned and provide a venue for mainstreaming HI approaches in partners' health agendas.

EHP's partnership with the **Child Survival Collaborations and Resources Group (CORE Group)** provided access to several PVO organizations for promoting hygiene improvement and skills transfer. Partnering with **Catholic Relief Services (CRS)** provided EHP with a venue for mainstreaming HI approaches in partner agendas. EHP had significant input in the development of the "CRS Community Health Workers' Training Manual" that CRS will use for community health worker training related to prevention of diarrhea in CRS countries. In Nicaragua and Peru, EHP partnered with **PAHO** in the C-IMCI program for diarrheal prevention. Under the **West Africa Water Initiative (WAWI)**, 14 partner institutions including USAID work together towards a common vision—to increase access to sustainable safe water and environmental services and reduce the prevalence of water-borne diseases in Ghana, Mali and Niger. Leadership and major funding for WAWI was provided by the Conrad N. Hilton Foundation. USAID (through the Integrated Water Resources Management implemented by ARD) played a lead role in developing the WAWI monitoring and evaluation plan with technical assistance from EHP. To promote the

harmonization of existing water and sanitation indicators and set standards for new hygiene indicators, EHP collaborated extensively with the **WHO** and **UNICEF** Joint Monitoring Programme (JMP), with the USAID-funded **MEASURE Project** and the **CORE Group**. These are just a few of the many examples where EHP promoted hygiene improvement broadly through strategic partnerships.

## Monitoring and Evaluation

Without appropriate guidance, programs are left to their own devices to define indicators and develop appropriate assessment instruments. While some programs such as child health, have well-established standards and detailed guidelines, hygiene improvement intervention programs do not. EHP worked with international organizations, PVOs and country programs to develop, test and disseminate standard indicators for HI.

- √ **Lesson:** Having standard indicators for each component of the HIF and guidelines helps a project to provide timely and effective M&E support to field programs.

There are no standard program indicators to monitor and evaluate important hygiene improvement elements, such as hygiene behaviors or community capacity as a measure of sustainability. To address this issue, EHP worked closely with the London School for Hygiene and Tropical Medicine, and the Water Supply and Sanitation Collaborative Council (WSSCC) to develop guidelines and model questionnaires. As a result, standardized hygiene improvement indicators were used for household and community surveys in the DR, DR Congo, India, Madagascar, Nicaragua, Peru, and West Bank. The indicators were also used in the M&E plans for WAWI in Ghana, Mali and Niger. In addition, the standard knowledge, practices and coverage (KPC) survey instrument used by PVOs in the CORE Group was updated and hygiene

improvement indicators were included in USAID's Child Health Indicator Guide.



Handwashing with soap is very effective in reducing diarrhea, especially in young children. Malagasy school children learn essential hygiene practices early to take home to their families and give them the skills for later in life.

## The Hygiene Improvement Challenges

EHP has shown that integration of HI into different program platforms is technically feasible and within the means available from donors and local partner organizations. However, many HI challenges have yet to be addressed:

- While EHP has been able to demonstrate that hygiene improvement can be programmed at scale through strategic partnerships and capacity building, more successful field examples with measurable results are needed.

Additional research is necessary to better understand what sustains hygiene practices in the long run, what enables communities to manage water supply systems effectively, or what can boost demand for and use of basic sanitation technologies and point-of-use water treatment. Answering these and other questions will be crucial for future HI programming.

- **More evidence about the effectiveness and sustainability of public-private partnerships is needed.**

The evidence from Central America has shown that the private sector can be successfully engaged. More evidence is needed, however, on the long-term sustainability of these partnerships, their effectiveness in achieving health impact, their ability to reach poor population groups, and their cost-effectiveness.

- **Barriers and motivating factors for changing essential hygiene behaviors need to be better understood through operations research to inform program design and implementation.**

The promotion of hygiene behaviors has been identified as an intervention that could have considerable impact in the reduction of diarrheal diseases in young children. Among these behaviors, sanitary disposal of feces has been the least studied area. An EHP-funded literature review on this subject by the International Institute for Nutrition (IIN) in Lima, Peru, found few studies describing the excretal disposal practices of young children at the household level and very few have investigated its relationship with diarrhea. Similarly, handwashing with soap or other agents is the most important intervention to be promoted to reduce fecal contamination, with proven efficacy in reducing diarrheal diseases. The literature review also found several barriers exist to limit handwashing such as wrong perceptions, including what is dirty and what is not. This review has identified the urgency, importance and need for more operations research

in these areas to better inform program design and implementation.

## Conclusion

To further integrate the Hygiene Improvement Framework into field programs, it is important to relate the HI lessons learned to the three most important dimensions of any public health program: scale, sustainability and effectiveness or impact. The Hygiene Improvement Framework has been instrumental in achieving results in all three dimensions. It has been used to design programs and activities systematically in a wide variety of field settings with varying resource constraints and to respond to different hygiene improvement needs and opportunities. Much work remains to be done to reduce diarrheal disease mortality and morbidity through hygiene improvement. Future investments should aim at integrating hygiene improvement into a broader range of programs and implementing interventions at scale.

*For the complete lessons learned, please refer to the full report: [Advancing Hygiene Improvement for Diarrhea Prevention: Lessons Learned. Strategic Report 10.](#)*

## Key EHP Documents

[Advancing Hygiene Improvement for Diarrhea Prevention: Lessons Learned. Strategic Report 10](#)

[Assessing Hygiene Improvement: Guidelines for Household and Community Levels. Strategic Report 8](#)

[Combining Hygiene Behavior Change with Water & Sanitation: A Pilot Project in Hato Mayor, Dominican Republic. April 2000–May 2002. Activity Report 125](#)

[Creating an Enabling Environment for Community-Based Rural Water Supply, Sanitation and Hygiene Promotion Systems: Case Study: Reforming the Rural Department of the National Water Agency \(INAPA\) in the Dominican Republic. Strategic Report 4](#)

[Guidelines for the Assessment of National Sanitation Policies. Strategic Report 2](#)

[Improving Health Through Behavior Change: A Process Guide on Hygiene Promotion. Joint Publication 7](#)

[Improving Sanitation in Small Towns in Latin America and the Caribbean: Practical Methodology for Designing a Sustainable Sanitation Plan. Strategic Report 3](#)

Institutional Support Mechanisms for Community-Managed Rural Water Supply & Sanitation Systems in Latin America. Strategic Report 6

Nicaragua: Rural Water Supply, Sanitation, and Environmental Health Program. Activity Report 106

The GESCOME Difference: Lessons Learned From Gestion Communautaire de Santé Environnementale (GESCOME); The Environmental Health Project II CESH Benin Activity. Strategic Report 5

The Hygiene Improvement Framework—A Comprehensive Approach for Preventing Childhood Diarrhea. Joint Publication 8

The Story of a Successful Public-Private Partnership in Central America: Handwashing for Diarrheal Disease Prevention. Joint Publication 1

Urban Environmental Health Strategies: Three Community-based Environmental Sanitation and Hygiene Projects Conducted in the Democratic Republic of Congo. Activity Report 119

USAID Village Water and Sanitation Program West Bank: Environmental Health Assessment—Phase I. Joint Publication 5

USAID Village Water and Sanitation Program West Bank: Environmental Health Assessment — Phase II. Joint Publication 6

West Africa Water Initiative (WAWI) Monitoring and Evaluation Plan, Program Framework and Indicators. Activity Report 124

# Improving Vector Control and Surveillance for Malaria and Other Vector-borne Diseases

— Gene Brantly, ECHO Coordinator

More people die from malaria today than 40 years ago.<sup>10</sup> Each year, malaria infects from 300 to 500 million people and causes up to 2.5 million deaths, mostly in young children in sub-Saharan Africa.<sup>11</sup> Malaria morbidity and mortality are both rising in Africa,<sup>12</sup> where they exact a large economic toll that contributes to the continued impoverishment and slow growth of many countries.<sup>13</sup>

The U.S. Agency for International Development (USAID) is working to reduce the burden of this disease by helping countries develop the capacity to prevent and treat malaria more effectively. USAID works closely with the Roll Back Malaria partnership<sup>14</sup> at the global, regional, and country levels. USAID also provides leadership for other global partnerships, invests in new technologies such as malaria vaccine development, and provides technical assistance to help countries increase access to technologies for malaria prevention and effective treatment.<sup>15</sup>

<sup>10</sup> Guerin PJ, P Olliaro, F Nosten, P Druilhe, R Laxminarayan, F Binka, WL Kilama, N Ford, NJ White. Malaria: current status of control, diagnosis, treatment, and a proposed agenda for research and development. *Lancet Infect Dis* 2002, 2(9):564-73.

<sup>11</sup> WHO/UNICEF. 2003. The Africa Malaria Report 2003. WHO/CDS/MAL/2003.

<sup>12</sup> Snow W, J Trape, K Marsh. The past, present and future of childhood malaria mortality in Africa. *Trends in Parasitology*, 2001-17, 593-97.

<sup>13</sup> Sachs J, P Malaney. The economic and social burden of malaria. *Nature* 2002; 415(6872):680-85.

<sup>14</sup> See <http://rbm.who.int/cgi-bin/rbm/rbmportal/custom> for more on the RBM Partnership.

<sup>15</sup> See [www.usaid.gov/our\\_work/global\\_health/id/malaria](http://www.usaid.gov/our_work/global_health/id/malaria) for more on USAID malaria programs.

USAID uses a wide variety of central and bilateral projects, cooperative agreements, and interagency agreements to implement its malaria program. Within this broad context, USAID has tasked the Environmental Health Project (EHP) with two specific roles:

1. Develop, evaluate, and promote the effective use of vector control methods, in the context of Integrated Vector Management.
2. Support improvements in surveillance, including the collection and use of case reports, environmental and demographic data, and other information to better understand disease distribution patterns and strengthen disease control programs.

This paper summarizes lessons learned through work on these topics from 1999 to 2004. Over this period, EHP has provided assistance to control programs for malaria, visceral leishmaniasis (kala-azar), Japanese encephalitis, and dengue fever in Eritrea, Ghana, Kenya, Malawi, Mozambique, Nepal, Uganda, Tanzania, and Zambia and in regional initiatives in Africa, Latin America, and South Asia.



Taking blood from a finger prick to look for malaria in Eritrea

# I. Integrated Vector Management

## Vector Control Options for Malaria

There are four methods for controlling the anopheline mosquitoes that transmit malaria. The two principal methods are insecticide-treated nets and other materials (ITNs) and indoor spraying with a residual insecticide (IRS). These methods kill adult female mosquitoes that alight on the treated surfaces. ITNs and IRS have been proven effective in a variety of environmental and epidemiological settings.

The third method is environmental management, which reduces or eliminates the small water pools into which female anopheline mosquitoes lay their eggs. The fourth is larval control, which employs chemical or biological pesticides applied to the surface of aquatic habitats to kill mosquito larvae, or synthetic insect-growth regulators to prevent larvae from developing into adults. These methods suppress the overall size of the mosquito population. Although such methods have occasionally been effective over large rural areas, today they are most appropriate in urban and arid areas, where there are relatively few suitable habitats for anopheline larvae.

There are also many personal protection measures that individuals and households use. Smoke from biomass fires, insect coils, repellants, window screens, and insecticide sprays reduce exposure to infective bites for the people who use them. Insecticide-treated nets provide personal protection for the individuals who sleep under them, even when the number of nets being used in the area is too low to produce a significant impact on the mosquito population.

## Lessons Learned

- ✓ **Lesson: Integrated Vector Management is now the accepted technical framework**

for vector control programs for malaria and other vector-borne diseases.

The World Health Organization (WHO) will soon issue a Global Strategic Framework for Integrated Vector Management (IVM). The framework has been developed in consultation with a broad range of experts, including participants from EHP. The document will be disseminated widely and will serve as an essential part of WHO's guidance for planning and implementing vector control programs.

In the framework, Integrated Vector Management is defined as "a process for managing vector populations to reduce or interrupt transmission of disease.

"Characteristics of IVM include:

- Methods based on knowledge of factors influencing local vector biology, disease transmission and morbidity
- Use of a range of interventions, often in combination and synergistically
- Collaboration within the health sector and with other public and private sectors that impact on vectors
- Engagement with local communities and other stakeholders
- A public health regulatory and legislative framework."<sup>16</sup>

In an IVM program, several vector control methods may be used for the same disease, and a particular method may be used to control more than one disease simultaneously. For example, in Nepal during the malaria eradication program from the 1950s to the 1970s, IRS used for malaria also helped control kala-azar, which is transmitted by sand flies. The incidence of kala-azar accelerated after the malaria program was decentralized and DDT use was discontinued.<sup>8</sup>

<sup>16</sup> World Health Organization. Global Strategic Framework for Integrated Vector Management. 2004. WHO/CDS/CPE/PVC/2004.10.

There are three motivations for developing and promoting IVM. First, many countries include diverse physical environments in which several of the available vector control methods may be effective. For example, Kenya has highlands, coastal areas, cities, and savannah. ITNs and IRS are effective in all of these settings.

Environmental management and larval control are effective in cities and potentially in the highlands as well. In a well-run IVM program, program staff at the central and district levels are able to plan, implement, and monitor several types of vector control operations simultaneously, so they can use each method where and when it is most likely to be effective.



A man being treated for Malaria in Eritrea

A second reason for adopting IVM is to reduce the use of chemical pesticides. Many countries want to gradually reduce their use of insecticides either as a matter of general environmental policy or to contain the cost of vector control programs. IVM can help achieve this goal by exploring and expanding the use of non-chemical methods.

Finally, since in most developing countries only a very small cadre of staff has expertise in medical entomology and vector control, it may be more efficient for them to work as part of a single unit dedicated to vector and pest control (i.e., IVM)

that provides support to several disease control programs, rather than assigning them separately to each of the disease control programs or departments. This can create greater opportunities for leveraging experience, sharing expertise, and coordinating control efforts for various disease vectors. In this context, an IVM program might be manifested in the form of vector biology and control units at the central and district levels.

Much of the leadership for adopting IVM as a formal framework has come from the WHO regional offices for Africa (AFRO) and the Eastern Mediterranean (EMRO), and from WHO headquarters' involvement in negotiations of the Stockholm Convention on Persistent Organic Pesticides.<sup>17</sup> USAID and EHP have provided consistent and substantial support for this initiative through involvement in the IVM Partnership for Africa, help to develop a Vector Control Needs Assessment protocol, financial support for meetings of the African Network for Vector Resistance Monitoring, participation on the steering committee of a WHO-UNEP project to support the development of alternative vector control strategies in six African countries that currently use DDT, participation in the WHO Informal Consultation on a Global Strategic Framework for IVM, and other activities. This partnership and consistent engagement have been essential for making progress on IVM policy and implementation.

√ **Lesson:** National malaria control programs want to make greater use of all proven vector control methods.

Insecticide-treated nets have been the principal vector control intervention promoted and used under the Roll Back Malaria partnership, and demand for ITNs has grown quickly over the past five years. Demand for using the other interventions—indoor spraying, environmental

<sup>17</sup> Houston, R., Evolution of a Pilot Strategy to Improve the Management of Kala-azar and Malaria in Nepal. EHP Activity Report 131.

management, and larval control—has also grown over this period.

EHP has played a leading role in the investigation of environmental management and larval control methods as part of IVM for malaria control. In **Eritrea**, EHP tested the efficacy of environmentally-safe bacterial larvicides and then designed and implemented a two-year pilot program to develop locally-appropriate protocols for the routine, operational use of larval control.<sup>18</sup> In **Uganda**, EHP has provided technical support to help local government teams test the use of environmental management and larval control methods in Kampala and Jinja.<sup>19</sup> In both countries, initial evidence demonstrates that the methods have reduced mosquito populations and the rate of infective bites in households near the controlled areas. Larger studies and longer periods are needed to determine whether these changes will lead to lower malaria incidence. EHP is also supporting field studies in Dar es Salaam, **Tanzania**, and Kilifi, **Kenya**, to evaluate the potential impact of larval control methods in two coastal cities in Africa and in the Kakamega District of Kenya to evaluate their potential use in highland areas.<sup>20</sup> These studies will continue beyond the end of EHP.

USAID's modest investments in operational research on larval control methods have catalyzed other, larger investments for developing and demonstrating these techniques. The U.S. National Institute of Allergies and Infectious Diseases recently awarded three large grants for multi-year studies of anopheline larval ecology and control in Africa. The principal investigators for two of the three awards are key contributors to EHP's work, and the third has had a key role in

malaria transmission and intervention studies in Kisumu, funded by USAID and implemented by the U.S. Centers for Disease Control and Prevention.

Demand for expanding the use of indoor spraying (IRS) is rising throughout Africa and elsewhere. For example, **Zambia** is using a large portion of its Global Fund award to expand IRS coverage in five key cities, an effort for which EHP is providing technical assistance. **Mozambique** has sought funds from USAID to expand IRS coverage in major cities, as part of a malaria control support project that EHP helped design. **Eritrea** is using funds from the U.N. Environment Program to rationalize its use of IRS and, over the long term, reduce its use of DDT as part of an IVM program for malaria. In **Kyrgyzstan**, WHO is using funds provided by USAID to support IRS operations for malaria.

Three factors are contributing to the growth in demand for IRS. First, it has been effective in reducing malaria transmission, cases, and deaths in operational control programs implemented at scale in various settings. Second—and probably most important—the Global Fund is providing many countries with access to the substantial level of funding required to pay for IRS programs. Finally, the Stockholm Convention on Persistent Organic Pesticides includes an exemption allowing signatories to use DDT for public health purposes. This recent development, coupled with the long-standing policies, guidance, and programs from WHO to support the judicious use of IRS, has caused participants in the Roll Back Malaria partnership to provide greater and more open support for countries that wish to expand the use of IRS.

√ **Lesson:** Professional training and experience in entomology and vector control are critical for running an Integrated Vector Management program that makes appropriate use of all available control methods.

<sup>18</sup> Stockholm Convention on Persistent Organic Pesticides, entered into force 17 May 2004; see <http://www.pops.int>

<sup>19</sup> Lindsay, S. and T. Egwang. Uganda: Reducing urban malaria using environmental management in Kampala and Jinja. EHP Activity Report (forthcoming).

<sup>20</sup> Fillinger, U., S. Lindsay, A. Githeko, M. Kiama, and G. Killeen. Pilot Studies of Anti-Larval Methods for Controlling Malaria in Africa. EHP Activity Report (forthcoming)

EHP has made important contributions to staff development in **Eritrea**, **Zambia** and **Nepal** and to training field entomology staff in conjunction with the larval control studies in **Kenya** and **Tanzania**. Based on work done in these settings, EHP has prepared training materials and approaches for building in-country capacity to implement IVM for malaria control, including:

- Building field and laboratory capacity for essential research and surveillance
- Building operational capacity for malaria vector control interventions
- Building capacity for data management, analysis, and use

However, the lack of a sufficient number of skilled, experienced and dedicated staff with adequate program support is the most important constraint for scaling up coverage with vector control interventions in Africa.

In **Eritrea**, much of the population has been mobilized under arms for the last 20 years, creating a generation gap between the senior, experienced managers and the young, newly trained apprentices. The program is effective and successful, but operates on a very thin margin at constant risk of losing critical expertise. Through a series of operational research studies and improvements in surveillance, field staff have been trained in basic entomological methods and larval control techniques. EHP has also contributed to the training and improved supervision of a new cadre of Environmental Health Technicians. Despite these advances, program staffing remains thin. The recent death of a zonal program manager has compromised the continuity and integrity of malaria control activities in that zone.

In **Zambia**, frequent turnover among the central malaria program staff and multiple other duties has hampered their ability to provide technical support to the districts for planning and implementation of Global Fund resources for

expanding the use of IRS. Moreover, at the district level, the lack of dedicated trained staff and vehicles led to problems with supplies and logistics, reporting, quality of spray operations and safe handling of pesticides. Experienced staff were spread too thin to provide effective oversight. Although the problems are clear and program leaders are motivated, the shortage of experienced staff is a finite problem that cannot be overcome quickly.

Training, supervision, and staff retention will remain critical challenges for improving vector control for some time. Ad hoc, competitive efforts by various institutions to provide training in malaria entomology and vector control in Africa have not substantially increased the availability of skilled staff at the operational level of malaria control programs. A comprehensive regional strategy is needed for building capacity in IVM.

## II. Surveillance

EHP has devoted substantial funding and efforts to improving surveillance for malaria in Eritrea and several high-priority vector-borne diseases in South Asia. The general lesson from this large body of work is:

- √ **Lesson:** In areas prone to epidemics of malaria and other vector-borne diseases, understanding the local distribution of the disease and its relation to environmental and demographic factors will help public health officials improve the prevention and control activities they direct.

In **Eritrea**, EHP helped the ministry of health improve malaria surveillance by performing each of the following steps and analyses:

- Supported the design and implementation of a national malaria prevalence survey
- Supported planning for a network of malaria sentinel surveillance sites

- Disaggregated data on malaria cases and program interventions by week and reporting facility for the past six years to make more detailed analyses possible
- Prepared software to help zonal malaria officers extract malaria data routinely from the ministry's health management information system
- Assembled data on diverse environmental variables (rainfall, soil type, vegetation index, etc.) that might be useful in explaining the distribution of malaria
- Analyzed data from the prevalence survey to identify relationships between malaria prevalence and potentially relevant environmental variables, and used results from the analysis to prepare a detailed map of malaria stratification in Eritrea
- Used the disaggregated historical data to identify site-specific thresholds for defining and detecting malaria epidemics
- Used insights from the preceding work to prepare a manual on epidemic detection, preparedness and response for Eritrea's National Malaria Control Program
- Analyzed historical climate and rainfall patterns for Eritrea and related these to malaria incidence over the same period, to prepare epidemic forecasting models that are specifically tailored to the several climatic zones of the country.

In **South Asia**, EHP worked with disease control officials in **Nepal, India, Bangladesh**, and **Bhutan** to reach agreements on standardizing surveillance protocols for Japanese encephalitis, kala-azar, and resistance to anti-malarial drugs. Over the course of five years, EHP organized five regional meetings, several bilateral (cross-border) meetings between adjoining countries, developed and maintained a web-site ([www.bbin.org](http://www.bbin.org)), and sustained ongoing dialogue and collaboration with officials of the national ministries, the Southeast Asia Regional Office of WHO

(SEARO), and various universities and research institutes that are resources within the region. The four key accomplishments from this work are:

- A multi-country agreement to standardize the case definition, diagnostic protocols, and reporting conventions for Japanese encephalitis
- A regional agreement to use standard protocols for evaluating *in vivo* resistance to anti-malaria drugs
- The first coordinated studies of anti-malarial drug resistance in adjoining districts of West Bengal and Nepal
- A bilateral agreement between adjoining districts in India and Nepal to share information on incidence, trends, and interventions for kala-azar, and to coordinate both the timing and content of public information campaigns on both sides of the border to ensure the maximum effect of the kala-azar campaign.

EHP has prepared a set of useful guidelines for improving malaria surveillance in areas of of seasonal and low transmission that are epidemic-prone.<sup>21</sup>

## Future Directions

Looking forward, the following are priority actions for advancing integrated vector management and malaria surveillance:

- Developing and field testing approaches for engaging community organizations in an effective partnership with the operational and regulatory personnel of government departments (health and local government) to implement environmental management and larval control interventions.

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<sup>21</sup> Graves, P. Improving Malaria Surveillance in Areas of Low and Seasonal Transmission. EHP Strategic Report (forthcoming).

- Developing greater capacity in malaria control programs for collecting, managing, and analyzing malaria case reports and environmental data that are useful for planning malaria control operations.
- Organizing and implementing regional training programs, professional associations, and technical assistance networks that can operate over the long term to build and sustain the human resource capacity needed for effective vector control programs.

## Key EHP Documents

An Inventory on Malaria Drug Resistance in Bangladesh, Bhutan, India and Nepal. Activity Report 130

Community-based Environmental Management Program for Malaria Control in Kampala and Jinja, Uganda. Final Report. Activity Report 140

Eritrea Field Studies of Efficacy of Bacterial Larvicides for Use in Malaria Control. Activity Report 112

First Year Summary Report. Development of a Community-based Environmental Management Program for Malaria Control in Kampala and Jinja, Uganda. Activity Report 122

Intercountry Collaboration for Improving Surveillance and Control of Vector-borne Diseases-Final Report of EHP Support in Bangladesh, Bhutan, India and Nepal. Activity Report 136

Malaria Vector Studies in Eritrea. Activity Report 111

National Malaria Prevalence Survey (2000-2001). The State of Eritrea Ministry of Health. Activity Report 134

Status of Insecticide Resistance of Malaria, Kala-azar and Japanese Encephalitis Vectors in Bangladesh, Bhutan, India and Nepal (BBIN). Activity Report 129

The Evolution of a Pilot Strategy To Improve the Management of Kala-Azar and Malaria in Nepal: A Review of EHP Support to the Ministry of Health. Activity Report 131



# Healthy People in a Healthy Environment: Integrating Population, Health and Environment

- *Eckhard Kleinau, Senior Technical Director*
- *Odile Randriamananjara, Voahary Salama Coordinator*
- *Fred Rosensweig, Activity Manager*
- *Jennifer Talbot, University of Michigan Population-Environment Fellow*

1992's Rio Declaration on Environment and Development identified the nexus between population and environment as a crucial element for achieving sustainable development<sup>22</sup>—a linkage that was reinforced at the International Conference on Population and Development in Cairo in 1994. Both Rio and Cairo also unequivocally voiced the need for integrated environment and development programs that take into account demographic trends. And they were equally persistent in calling for both strengthened research and the development of information about population, environment, and sustainable-development interactions.

But success in implementing these goals on international, national, and local levels has been modest. While nations at the 2002 World Summit on Sustainable Development in Johannesburg reaffirmed their commitment to the Rio Declaration and the global program entitled Agenda 21, the Summit's agenda and discussions remained all but silent about the role of population and reproductive health in addressing unsustainable patterns of consumption and conserving the environment. Over a decade after Rio, organizations are still struggling to make

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<sup>22</sup> De Souza, Roger-Mark, John S. Williams, and Frederick A.B. Meyerson. 2003. *Critical Links: Population, Health, and the Environment*. Population BULLETIN, Vol. 58 No.3, September 2003. Population Reference Bureau (PRB); Harrison, Paul and Pearce, Fred. 2001. 'AAAS Atlas of Population and Environment' Victoria Dompka Markham, editor. 215 pages. American Association for the Advancement of Science and the University of California Press.

truly integrated population, health and environment (PHE) programs effective.<sup>23</sup> In a world where population growth in many developing countries is still unsustainable,<sup>24</sup> poverty is on the rise, and ecosystems are under constant threat, it has become more important than ever to demonstrate the enhanced value of integrated PHE programs, especially given that several foundations have had to cut back funding for this type of program.<sup>25</sup>

However, linking sustainable development with environmental conservation has always been controversial. A recent article summed up the issue by stating that "Sustainable development has become an environmental mantra across the Third World. But critics increasingly ask if people and wildlife belong together at all."<sup>26</sup> One important argument for linking sustainable development with environmental conservation is that poorer countries cannot simply declare natural resources off limits to people. The sustainable use of natural resources through improved agricultural practices and the protection of wildlife through eco-tourism has been promoted by development agencies like USAID and the World Bank as well as organizations in the countries concerned including indigenous peoples' movements.

Over the past four years, EHP has provided assistance to USAID in Madagascar integration PHE. The community-centered and integrated PHE program in Madagascar is predicated on the assumption that competing interests of

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<sup>23</sup> Melnyk, Mary. 2001. *An Ounce of Prevention*. Biodiversity Support Program (BSP); Vogel, Carolyn Gibb, Engelman, Robert. 1999. *Forging the Link: Emerging Accounts of Population and Environment Work in Communities*. Population Action International (PAI)

<sup>24</sup> McKee, Jeffrey. 2004. *Sparing Nature: The Conflict Between Human Population Growth and Earth's Biodiversity*. Rutgers University Press.

<sup>25</sup> Introduction adapted from: Eckhard Kleinau and Jennifer Talbot, 2003. *When the Whole is Greater than the Sum of its Parts: Integrated Indicators for Population-Environment Programs*. PECS NEWS-A Population, Environmental Change, and Security Newsletter, Environmental Change and Security Project, The Woodrow Wilson Center, Spring 2003.

<sup>26</sup> Steinglass, "No Man's Lands," Boston Globe, March 28, 2004

sustainable development and the conservation of biodiversity can be met:

- Indigenous peoples asserting their cultural heritage and rights to livelihood
- Development agencies trying to alleviate poverty
- Developing country governments seeking to grow their economies
- Environmental conservationists pursuing the protection of biodiversity

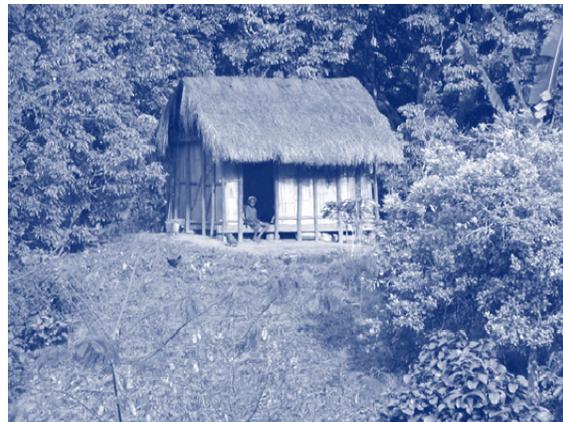
USAID supported the Voahary Salama Association (VS), an NGO umbrella organization, that implements the integrated PHE program along three major forest corridors and other threatened ecosystems in Madagascar. The goal was to demonstrate that linking natural resource management with health and population will increase the effectiveness and sustainability of these activities compared to their implementation through separate sector programs. Although activities covered a broad range of PHE interventions, the focus was on the following eight:

- Family planning
- Immunization
- Maternal and child nutrition
- Diarrheal disease prevention through improved water supply, sanitation and hygiene (all three combined, a.k.a., hygiene improvement)
- Malaria and other infectious diseases prevention and treatment
- Reduction of slash and burn practices and improved agriculture
- Reforestation
- Income generation

Three social marketing and social mobilization approaches played a central role in each of these eight technical areas:

- Champion community (community target setting, monitoring and celebration)
- Child-to-community (increasing life-skills, school enrolment and attendance through PHE themes)
- Farmer-to-farmer (model farmers teaching others improved agricultural techniques)

These three approaches are based on an early adopter or innovator model that has proven its value for changing people's attitudes and practices related to many behaviors in the PHE context.



Developing remote rural areas while conserving the environment is the principal aim of PHE integration in Madagascar.

Over a four-year period, EHP, in collaboration with other partners (see list), played a major role in developing institutional and technical capacity of local NGOs to implement integrated activities in 160 Malagasy communities covering a population of 125,000 (out of 500,000) along three major environmental corridors in Madagascar between 2000 and 2004. Funding came from the USAID Bureau of Global Health's Office of Population and Reproductive Health,

Office of Health, Infectious Diseases and Nutrition, and the USAID Mission in Madagascar. Systematic monitoring and rigorous evaluation under EHP's direction showed that integrated programs can be very effective at relatively low costs. Substantial improvements of key PHE indicators overall or in specific intervention areas were measured such as contraceptive prevalence rates, immunization coverage, access to safe water and basic sanitation, and the practice of less destructive natural resource management methods. However, health indicators such as malnutrition and diarrhea prevalence remained high. This can be attributed in part to high levels of poverty, a serious political crisis in 2002 and natural disasters from cyclones in early 2004.

- √ **Key Lesson:** The integration of health, population and natural resource management programs can achieve good results in each sector at relatively low costs compared to programs implemented separately because of complementarities of interventions and programmatic synergies that occur when local NGOs work in partnership.
- √ **Lesson:** Successful integration at scale is dependent on the establishment of effective mechanisms for a range of partners to collaborate.

The very nature of the integration of health, population, and environment programs requires a partnership among a range of organizations. Funds for integrated activities may come from those organizations interested only in protecting the environment or from those whose primary concern is protecting human health. Implementing organizations might specialize in either environment or health and population. In addition, many of the activities in communities are small scale in nature, and in some countries, only small NGOs work in those communities. Bringing together all these partners in a

collaborative effort is the only way that an impact at scale is possible.

In **Madagascar**, EHP helped form a partnership consisting of three kinds of organizations: those that provide either financial or technical assistance and NGOs that implement activities in the field. Voahary Salama Association, which began as a partnership and became a legally registered Malagasy association, consists of 29 partner organizations, nine of which are local NGOs implementing field activities. VS acts as an umbrella organization that provides training and technical and financial assistance to member NGOs, coordinates efforts among its members, plays a monitoring and evaluation role, and disseminates information and lessons learned. VS is expected to be completely independent and capable of receiving and managing its own funds by the end of 2004. Before the creation of the VS, there were individual organizations in Madagascar implementing PHE projects but independently and on a small scale with ad hoc and limited coordination. The establishment of a visible partnership has resulted in significantly improved coordination and enhanced technical capacity among the local NGOs. In addition, VS now has the potential to attract funds more easily than individual and small NGOs would be able to do.

- √ **Lesson:** The most cost-effective way to reach target populations in ecologically sensitive areas is through local NGOs that have the interest in and capacity to reach these communities.

Most ecologically sensitive areas are in remote locations and often NGOs are the only actors willing and interested in working in these areas. Few governments have the capacity and resources to work in remote communities. In Madagascar, this certainly proved to be the case. Fortunately, Madagascar has a number of NGOs with the capacity and interest in working in these areas. The total population living along three major environmental corridors is estimated to be

500,000 people, mostly in small communities under 1,000 inhabitants. To date, approximately 25% of this population has been reached through integrated PHE activities that are implemented by nine NGOs.

Over the past five years, EHP provided funds to a total of six NGOs to implement integrated activities in communities and to VS to provide technical assistance and training to these NGOs (The remaining NGOs are funded by other organizations). VS assistance included training in work plan development, setting up monitoring and evaluation systems, increasing technical skills in the PHE technical focus areas, and developing their social marketing and communications capacity. As a result of being part of VS, these NGOs have increased their capacity to implement integrated activities and now see themselves as part of a larger effort.

✓ **Lesson: Different mechanisms can successfully implement Integrated PHE.**

From the outset, the evaluation of the integrated PHE program in Madagascar had been designed as a natural experiment by comparing three different implementation modes:

- Multidisciplinary teams within one organization (the gold standard)
- Different health and environment teams within the same organization
- Field agents from different sector specific organizations—health, agriculture, environment

The three intervention types were compared to a control group that had either health or natural resource management activities or no program support at all. Good performance was observed for the multidisciplinary team approach as well as for the collaboration between two or more organizations. The NGO with two teams was not able to achieve as much as the others. While the two surveys showed clear differences between the

three intervention modes, this does not seem to indicate that one approach is better than others. The observed differences can easily be explained by:

- Geographic differences between the northern and southern areas-culture, access to infrastructure and services, economic opportunities, etc.
- Organizational capacity and commitment to integrated PHE
- Available resources where one organization may have more than 10 times the resources than another, but not cover a population that is larger by the same factor



School girl watering a vegetable garden in Madagascar

✓ **Lesson: Population, health and environment integration is effective.**

Results from an impact evaluation that the Voahary Salama Association conducted showed

substantial improvements of key PHE indicators overall or in specific intervention areas. The evaluation design compares intervention areas before and after integrated activities were implemented and compares the intervention areas to a control group at baseline and follow up:

- Prevalence rates for modern contraceptives, a key family planning indicator, increased from 12% at baseline to 17% overall and by 10% to 26% in one area.
- A significant proportion (15-25%) of women indicated that they would procure contraceptives from Community Based Distributors (CBD), an option not available at baseline. Government health centers and private pharmacies remained the main sources of supplies, especially for injectable contraceptives.
- Immunization rates for fully immunized children increased from almost 20% to 68% for children with and without a child health card. Immunization rate was 83% for children 12 to 23 months old where a health card was available.
- Access to improved water supplies rose from 19% to 24% in intervention areas overall and more than doubled in some NGO supported areas.
- Access to improved sanitation facilities increased slightly, from 52% to 55% overall, but by almost 20% in one area.
- Only about a quarter of the households interviewed admitted to practice slash and burn compared to over half at baseline.
- The proportion of households citing traditional contracts to reduce slash and burn practices more than doubled to 22%.
- An increase from 10% to 40% was observed for the recognition of deforestation and slash and burn as major causes of soil erosion.
- About 10% more households (24%) felt that their food production was sufficient for the

entire year compared to the baseline, which is still alarmingly low.

- Participation in village associations or committees by the head of household and by women remained stable at 44% and 31% respectively, compared to the baseline.
- Intervention areas performed generally much better than control areas for these indicators.

While the improvements may be comparable to those achieved by vertical sector specific programs, they are noteworthy for three reasons. First, results were achieved in multiple sectors, not just in a narrow subset of technical interventions. Second, without the integrated PHE program the underserved populations living around forest corridors would not have benefited from essential health and agricultural services. Third, these results were achieved at relatively low costs and at a scale that compares favorably to vertical programs. All this indicates that important synergies exist in an integrated approach that covers multiple sectors.

√ **Lesson:** At the community level, people's choices related to PHE must be seen in the context of their livelihood and food security.

Basic economic needs have to be met to maximize the impact of the interventions in PHE. As the higher diarrheal disease prevalence and unchanged high levels of child malnutrition have shown, factors other than program interventions seem to play a major role in health outcomes. Based on the asset index included in the household surveys and field observations, the majority of households in the program area live well below the poverty line. Three in four households do not produce enough food to last an entire year, and cash income to supplement harvests is not readily available.

Voahary Salama NGOs and other partners (for example, the USAID funded eco-regional

conservation and development project) have promoted cottage industry and income generation. Data from two surveys, however, indicated that these activities are still at small scale level, and few families benefited from credits or were provided equipment to improve productivity. Even if production increases in these remote rural communities, it will be difficult for villagers to sell their products unless the transportation infrastructure improves. The impact survey in 2004 shows that half of the villages are only connected by dirt track or foot path and about 40% of the villages are 5-15 kilometers away from the nearest market. Reduction in the high levels of poverty and food insecurity need to accompany improvements in family planning, maternal and child health, agriculture and natural resource management to result in health impact.

- √ **Lesson: Communities must be active participants in integrated PHE programs and can self-determine sustainable development activities when appropriate including feasible social marketing and mobilization approaches.**

Three social marketing and mobilization approaches—champion community, farmer to farmer, and child to community—have been implemented to a varying degree by the NGOs. Where they have been used, they seem to be associated with larger improvements of key indicators. Communities seem to be motivated by setting targets themselves, monitoring these targets, and celebrating their successful achievement with the help of NGOs. Where communities have not set specific targets, progress seems slower. Long term effects of this intensive collaboration with primary schools are expected to result in significant behavior change as children grow up having learned about sanitation and hygiene, nutrition and non-destructive and improved agricultural practices.

## Challenges of Integrated PHE

While the effective integration of PHE poses many challenges, the following two emerged as important for the future direction of PHE integration in Madagascar and beyond.

- **Does the integration of PHE improve health and livelihood?**

Despite the improvements in intermediate program outcomes, the health status indicators did not improve. The diarrhea prevalence was 25%, which was almost twice as high in all intervention and control areas during the second survey, ranging from 15% in one region to almost 40% in another. Malnutrition remained very serious and affects one in two children under five. Several factors may explain why measurable changes in health outcomes were not observed: (1) three years of interventions was probably too short; (2) two major cyclones passed through Madagascar right before and during the impact survey in 2004 but did not occur during the baseline survey in 2001; (3) a political crisis in 2002 following elections led to major disruptions and food shortages; and (4) four in five households in rural areas of Madagascar still live well below poverty levels. Achieving health and socioeconomic impact through integrated PHE interventions and measuring the impact should be the long-term focus of program efforts.

- **Can development activities conserve ecosystems and biodiversity?**

The program in Madagascar was not designed to answer this question in the short term, but the foundation for answering this question has been laid. This will require that data from these household surveys and other qualitative assessments are linked with data on forest coverage, illegal hunting activities and slash and burn practices. The environmental data are

available from conservation organizations such as Conservation International and the World Wildlife Fund. A close collaboration between Voahary Salama and these organizations is planned over the coming five years to carry out time series and special analyses to answer this important question.

## Conclusions

The experience from the integrated PHE program in Madagascar has shown that NGOs can play a significant role in improving family planning and maternal and child health services and making improvements in agriculture and natural resource management for populations that are inaccessible. Their support by other donors and projects in the form of direct funding and technical capacity building has been critical to their success. Future programs in the health and environment sector should consider expanding the roles of NGOs as a cost-effective way to rapidly cover difficult to reach populations in vast geographic areas with interventions that promise to have a health impact and protect natural resources and remaining ecosystems in the longer run.

## Voahary Salama Partners and Supporting Organizations

### Malagasy NGOs Implementing PHE

Action Santé Organisation Secours (ASOS)

Adventist Development and Relief Agency International (ADRA International)

Fanentanana Fambolena Fiompiana (FAFAFI)

Madagascar Institut pour la Conservation des Environnements Tropicaux (MICET)

Malagasy Teknisiana Mivondrona ho aro sy Tezan'ny Zahamena ary ny Ala atsinanana (MATEZA)

Medical Care Development International (MCDI)

Ny Ainga

Ny Tanintsika

SAF/FJKM Development Office of the Church of Jesus Christ in Madagascar (Sampan'Asa momba ny Fampandrosoana/Fiangonan'i Jesoa Kristy eto Madagasikara)

## Other Members of Voahary Salama

Association Nationale d'Actions Environnementales (ANAE)

Association Nationale pour la Gestion des Aires Protégées (ANGAP)

Conservation International

Direction Nationale de la Fédération Kolo Harena

Environmental Health Project (EHP)

Landscape Development Interventions (LDI)/ Chemonics International Inc.

LINKAGES Project

Madagascar Green Healthy Communities Project (MGHC)/John Snow, Inc. (JSI)/ Packard Foundation

Ministère de l'Environnement et des Eaux et Forêts

Ministère de la Population

Ministère de la Santé

Office Nationale pour l'Environnement (ONE)

Office Nationale pour la Population (ONP)

PACT, Inc.

Population reference Bureau (PRB)

Service d'Appui à la Gestion de l'Environnement (SAGE Fampandrosoana Maharitra)

TANY MEVA Foundation/Summit Foundation

University of Michigan Population and Environment Fellows Program

United States Agency for International Development (USAID)

World Wildlife Fund (WWF)

## Key EHP Documents

Integration of Health, Population and Environmental Programs in Madagascar. Midterm Progress Report. Activity Report 115

Integration of Population, Health and Environment in Madagascar, Summary Report. Activity Report (forthcoming)

Voahary Solama. 2001. Health, Population and Environment Survey. DSS/INSTAT, EHP/USAID (Available in French)



# Urban Health

— Sarah Fry, Activity Manager

— Siddharth A. Agarwal, Urban Health Director (India)

EHP and its predecessor projects have been addressing the needs of people living in marginalized urban settings for over 15 years. Beginning with water supply and sanitation in peri-urban settlements, activities have evolved to broader hygiene improvement and child health interventions for the urban poor who might live at the fringes of a city or in pockets of poverty in the middle of one. Most recently, EHP worked to set these efforts within the broader context of urban health.

EHP's urban health portfolio included two large programs and several smaller scale activities. The centerpiece of EHP's urban health programming is the USAID/India Urban Child Health and Nutrition Program, with slum-based neonatal health and hygiene improvement activities in Indore, Jamshedpur, Kolkata and Agra. Other key components are advocacy and technical assistance to the GOI in developing urban health strategies and increasing the knowledge base of urban child health information. The program is two years old and will continue to be funded by USAID/India beyond the end of EHP.

The second large urban health activity is the Asia Near East (ANE) Urban Health Initiative, funded by the Asia Near East Regional Bureau. Since 2001, EHP has carried out activities aimed at increasing the understanding of urban child health conditions throughout the region and has proposed program strategies that could be effective for USAID. The Initiative included a desktop study of child health in slums of Asia and Near East, an on-the-ground health and hygiene improvement program in a slum in Cairo (the Cairo Healthy Neighborhood Program) in partnership with the USAID/Egypt Mission and Making Cities Work (USAID/EGAT Urban Programs), and the sponsoring of an urban health

workshop for all ANE Missions held in Agra, India, in February 2004.



Improving the plight of the urban poor requires a community driven process: Women planning and learning together in Indore, India

EHP also conducted an urban health assessment for the USAID/Ghana Mission prior to its 5-year strategy development, which led to the inclusion of an urban focus in one of its key health programs. In addition, EHP participated in the final evaluation of the USAID-funded CARE/Madagascar Urban Environmental Health/Food Security Project.

Key program lessons emerging from the Cairo Healthy Neighborhood Program and from the India Urban Child Health Program are as follows.

## Lessons Learned

- ✓ **Key Lesson:** Focusing child health interventions in urban settings is crucial. Evidence shows that the health status of children in urban poor settings is as bad and often worse than in rural areas. Urban poor children under-five suffer more and die more often from diarrhea and acute respiratory infections than rural children.

- √ **Lesson:** For an urban health initiative to be sustainable, it is critical to identify and involve the universe of stakeholders in the activity at various times and in various ways. Stakeholders can be from the community, the local and national government, private sector, non-governmental sector, etc. This approach is essential to effective urban programs.

The principle of stakeholder involvement is part of EHP's approach to development work. It has been particularly effective when applied to urban program settings. In Egypt, the complexity of the governance structure for the target neighborhood was unraveled and the right people who have power to act were brought to the table. Stakeholder meetings have included elected parliament members as well as officials from the local and governorate (provincial) levels of government. Coupled with regular telephone communications and meeting minutes, decision makers at senior levels have become better informed about the problems and activities in the slum. In India, this process has led to the creation of partnerships and context-appropriate strategies, promotion of ownership, improved resource utilization from varied sources and elimination of duplication of efforts. In the Ghana urban health assessment, identifying stakeholders helped create an urban organogram of use to both the GOG and USAID in developing urban components to health programs.

- √ **Lesson:** There is insufficient good data on urban poor, at-risk populations. There is a need to develop better urban data collection tools and strategies, including mapping of slums and bring evidence of need and conditions into the program planning and advocacy process.

As part of the ANE Urban Health Initiative, EHP conducted a desktop study on urban child health in the ANE region. The conclusion that little useful data were available on the subject led EHP to address the problem of good available data on the urban poor through a number of activities.

EHP has been working closely with EGAT/Urban Programs to improve both the indicators and the data collection process for sampling urban slum populations, leading to the development of a separate EH module specially adapted to urban settings. In addition, EHP/India had conducted a large baseline survey in the city of Indore and has reanalyzed DHS data for large urban agglomerations such as Mumbai according to a standard of living index. Findings are that infant and child mortality rates and malnutrition are worse in urban children than in rural ones.



Saving children's lives and improving their health in urban slums requires new partners and innovative approaches that are based on information collected from households during a survey in Indore, India.

In Egypt, the Cairo Healthy Neighborhood Program is finalizing a quantitative neighborhood environmental assessment and a water quality assessment to complement a qualitative situation analysis. Results of the data collection are shaping program approaches and influencing policymakers. The maps and data information generated by project activities have been in great demand by local officials and organizations. Information of this sort has not generally been available for local users.

- √ **Lesson:** Resources dedicated to urban health exist. They can be identified and leveraged through stakeholders meetings and advocacy events.

In India and Egypt, meetings with urban stakeholders where evidence-based, environmental and health conditions in urban slums were presented for discussion and action, previously unknown resources—financial, material and organizational—were brought to the attention of program implementers. In India, technical assistance to the stakeholders in proposal development led to formulation of plans for improving services and increasing coverage using newly identified resources.

- √ **Lesson:** Environmental factors and lack of services contribute significantly to health problems in urban poor settings. Lack of water and sanitation is top on the list. Any urban health effort should consider an environmental health component, and the Hygiene Improvement Framework (access to hardware + hygiene promotion + enabling environment) is a useful program organizing tool.

In the qualitative and quantitative surveys undertaken or reviewed by EHP, urban slum residents place problems with adequate drinking water and excreta disposal at the top of their complaints about inadequate services. The high incidence of hygiene-related diseases corroborate this problem. In Indore, EHP is working with both the community and the municipal corporation to find slum-specific approaches to improving sanitation. EHP brought Indore officials on a study tour of Pune where the city has successfully addressed slum sanitation. The community is developing a plan for maintaining a rehabilitated toilet block. NGOs and CBOs are conducting hygiene behavior change promotion in slums.

In the Cairo slum neighborhood, water and sanitation improvements are being supported

through a grant from Making Cities Work, while complementary hygiene promotion is being carried out via adult literacy and community promoters using materials featuring urban hygiene themes. Combining hardware and software interventions leads to improved chances for health impact.

Health sector agencies can partner with municipal agencies, private providers and donor programs whose role it is to provide WSS services. Stakeholder meetings are good venues for this collaboration

- √ **Lesson:** Principles and processes of community participation and empowerment are as important if not more so when developing and carrying out health programs in urban slums as compared to working with rural communities.

The USAID/CARE Madagascar Urban Environmental Health Program put as much effort into a “community-driven development” process as in infrastructure development. The process involved helping neighborhoods form development committees who produced a Neighborhood Development Plan after careful analysis of problems of infrastructure, services availability and health conditions. These Development Plans are now being used by the Municipal Government of Antananarivo as the basis for improvements to the neighborhoods, legitimizing the grassroots work of the neighborhood residents.

In India, Participatory Community Inquiry on neonatal survival and birth practices led to development of a methodology for the community to shape the direction of the health program. Community ownership is being fostered through community-based organizations, who are the main implementers, with support from NGOs and municipal services. City-based program efforts and policy review and program development at state and national levels are going

on simultaneously. Learnings from the slum-based program feed into the development of appropriate policies and large-scale programs.

- √ **Lesson:** Lack of services and official neglect of urban slums stem largely from the urban poor not having a voice in requesting their due from the municipal and national structures governing them and often from official ignorance. A two-tiered approach to empowerment and change is often required, with activities at the level of the individual local community in conjunction with changes in policy at higher levels of government authority.

In the Cairo Healthy Neighborhood Program, the emphasis on a two-tiered approach started with the kickoff community level and government/donor level stakeholders meetings. This led to the formation of a coordination committee that has met on and off during implementation in the community. Through this committee, the local government, the Ministry of Health and Population, and the governorate responsible for the neighborhood have become very aware of issues related to service delivery in urban slums and have begun to address issues of policy obstacles.

- √ **Lesson:** There is a need for urban health programs to include the large number of private (formal and informal sector) health providers who are accessed by the urban poor. Urban health programs should seek ways to improve the quality of their services rather than exclude them.

Surveys of the urban poor show that a large proportion prefers to use private providers for health care because of accessibility, confidence and affordability factors. Most health programs, however, work with the public sector. In India, the Urban Child Health Program is partnering with formal health providers who provide services at periodic health camps for women and children. Utilization of the private informal sector

is still a challenge the program is hoping to address in the future.

In Cairo, the project has focused on efforts to formalize the government and private sector institutional relationships that relate to maintenance and operation of informal, private sewer networks. Discussions are underway to finalize a protocol between the community (through a local NGO), the local government unit and multiple private contractors, which clarifies the roles and responsibilities of the different parties. This will improve the capability of contractors to effectively install and maintain the sewage disposal infrastructure.

- √ **Lesson:** Urban health programs must allocate resources to identify, map and prioritize the most vulnerable slums and urban poor populations. Projects should be designed so that small amounts of money can be injected regularly into local organizations to enable them to sustain their catalytic actions in the community.

The USAID/India Urban Health Program realized early on that it could not cover the needs of the huge numbers of urban poor residing in Indian cities, even in select cities. As part of its initial situation analysis of Indore, over 500 slums were identified. It became clear that some form of prioritization was necessary. From this, a “Health Vulnerability Assessment” process was developed, using criteria such as “presence of NGO” and a ranking system for these criteria. This process led to the identification of about 70 highly vulnerable slums where program interventions have begun. The methodology is being applied and refined in more Indian cities.

In the Cairo Healthy Neighborhood Program, the initial decision to focus on a particular neighborhood was taken as a result of discussions with the Ministry of Health/Population and the USAID mission. As the project’s environmental assessment activities commenced, the team faced questions of, “Why this site and not others?” This

highlights the need to develop a similar vulnerability assessment tool for use in the Egyptian context.

## Conclusion

Urban Health Programming is a relatively new field within EHP. We are continuing to learn as we move along with various program efforts. Developing urban health programs requires patience and participation. It takes time to understand the context, and to facilitate the development of a context-specific program. Early experience emphasizes the value of beginning programming efforts with an open mind, with no pre-designed program (as each urban center is unique with its own needs, resources, challenges and opportunities), only a broad objective and framework for partnership, assessing challenges and opportunities with stakeholders and seeking ideas. The initial experience has also reinforced the belief that if stakeholders have adequate and good technical information they can develop a program responsive to the needs and conditions of most vulnerable urban poor populations. Such a consultative planning process is key to the effectiveness and sustainability of urban health programs.

## Key EHP Documents

Cairo Healthy Neighborhood Program: Situation Analysis with Literature Review and Stakeholder Meetings, ANE Urban Health Initiative and USAID/Egypt/PHN. Activity Report 123

CARE Madagascar, Title II Final Evaluation Report of Findings. Joint Publication 9

Ghana Urban Health Assessment. Activity Report 114

Health of Children Living in Urban Slums in Asia and the Near East. Review of Existing Literature and Data. Activity Report 109

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Participatory Community Health Enquiry and Planning in Selected Urban Slums of Indore, Madhya Pradesh And A Field Guide for Community Facilitators of PCHEP. Activity Report 127

Situational Analysis for Guiding USAID/India and EHP/India Technical Assistance Efforts in Indore, Madhya Pradesh, India. Activity Report 133.

Technical Assistance to the Government of India for Urban Health Planning and National Guidelines. Activity Report 135