



Ecohealth Works



Infectious Diseases

Through ecohealth approaches, researchers, communities and policymakers are able to better understand and intervene in the web of environmental, socio-economic, and political factors behind the spread of infectious diseases.

THE CHALLENGE

Bird flu (H5N1), other emerging infectious diseases, and resurging epidemics, like malaria, dengue, tuberculosis, and diarrhoeal diseases, are among the greatest immediate public health and development challenges today. Infectious diseases cause significant individual suffering, disrupting everyday life and threatening livelihoods. According to the *2002 World Health Report* of the World Health Organization, infectious diseases cause one-third of the years lost to illness or death worldwide. They are the single most important contributor to morbidity and mortality in developing countries, and new diseases are emerging at unprecedented rates. The SARS (Severe Acute Respiratory Syndrome) outbreak in 2003 showed how the increased mobility of goods and people allows local outbreaks of diseases in remote areas to escalate and move between continents in mere days.

While recent infectious disease events have helped mobilize large amounts of funding and expertise to address pandemic preparedness and vaccine research, many infectious diseases, particularly those affecting the poor, have been neglected. The complexity of environmental diseases like Chagas and dengue defy effective control by vaccines or antimicrobials. People living in poverty may also be politically marginalized and living in degraded environments. They often lack assets, knowledge, and opportunities to gain access to health care or to protect themselves from infections. Vulnerable communities in developing countries are generally not as well protected by disease-prevention policies and programs as populations in developed countries.

Many infectious diseases are rooted in environmental conditions and mediated by social and individual determinants. Globalization, climate change, and macroeconomic forces are



C. Monroy

In Guatemala, the research team trained field workers from the Ministry of Health and members of the community to plaster walls in people's homes to prevent disease carrying bug infestations.

exacerbating the risks and impacts of infectious diseases. To respond to this complexity, researchers from many disciplines need to work collaboratively with stakeholders and policymakers at the relevant scales to find sustainable solutions.

WHAT'S HAPPENING?

Responding to the challenge, the International Development Research Centre (IDRC) supports ecohealth research and networks to make a difference in addressing intractable infectious disease problems. Ecohealth projects initiate research that responds to an increasingly recognized gap: the need for ecosystemic thinking in addressing the roots of infectious diseases and for regional collaboration in promoting the translation of research findings into policy and action.

GENERATING KNOWLEDGE

IDRC-supported researchers have successfully applied ecohealth approaches to produce knowledge on the root causes of infectious diseases worldwide.

Fighting Chagas disease in Guatemala

Chagas disease is a serious infection transmitted from animals to humans by a reduviidae bug. In Latin America, Chagas disease causes a greater burden of illness than all other tropical diseases combined. Presenting as a chronic infection that can last for decades, the illness significantly reduces the sufferer's ability to work and may lead to early death.

In Guatemala, 30 000 people are infected with Chagas disease every year. Working in Jutiapa, an area with frequent bug reinfestations, a multidisciplinary team of researchers examined 600 of the poorest households. In addition to assessing the level of infection in the community, the team searched for factors that could explain the presence of bugs even after multiple insecticide sprayings. They found that high-risk households usually had poor sanitation, earthen floors, live poultry indoors, and bugs hiding in the cracks of the rough mud brick walls. Many residents

did not understand that Chagas disease was transmitted by these large insects.

Researchers assigned high-risk houses in each village one of two prevention approaches: insecticide spraying alone (the conventional approach) or ecosystemic (a combination of spraying plus implementation of household improvements and other risk-reduction measures). Community and other stakeholders contributed to identifying the types of tools to be used. Both approaches reduced household reduviidae bug infestations, but the ecosystemic method was much more effective than spraying in preventing reinfestations. The bugs were forced to find other sources of food outside the house, where they fed on animals at a safe distance from people.

"This is something original," says Dr Carlota Monroy, the lead researcher. "We are actually shifting the blood preferences of the bug from humans to animals. The best thing about the ecohealth approach, however, is that community development is an integral part of it — this is not just about Chagas disease."

Rice farmers in Peru help combat malaria

In Peru, researchers are applying ecohealth approaches to tackle malaria. In the warm climate and flooded rice paddies of Lambayeque in northern Peru, mosquitoes reproduce quickly. A 33% increase of land under rice production between 2004 and 2008 has pushed paddies close to town, increasing the risk of malaria for residents.

A multidisciplinary Peruvian team of experts in vector control, public health, rice cultivation, communications, and sociology is collaborating with the Ministries of Health and Agriculture, cooperating regional and international agencies, and other organizations on the problem. They are working with the community's irrigation committees to convince small farmers to allow their rice fields to dry periodically. This is resulting in several positive outcomes: marked reductions in mosquitoes, better utilization of scarce water in rice irrigation, and even an increase in rice yields.

BUILDING CAPACITY

IDRC strives to build capacity of local researchers and organizations to generate meaningful results and promote excellence in research. Ecohealth projects also seek to empower communities to take charge of their own environment and health through the research activities.

A network takes shape in Africa

Since 1998, a community of ecohealth practitioners has emerged in Africa, drawn from a combination of IDRC-supported field research projects, a series of annual training courses, and scholarship competitions. Introduced in 2003, the training courses gather promising young researchers from West and Central Africa to explore ecohealth approaches with their senior colleagues.

Building on momentum from the short courses, in 2006, researchers launched West and Central Africa's Ecohealth Community of Practice (COPEs-AOC). Through the efforts of this Community of Practice, a group dedicated to building ecohealth curricula and practice in the region's universities now exists. Graduate students in Bénin, Burkina Faso, Côte d'Ivoire, and Cameroon are now learning about ecosystem approaches to health in their academic settings.

Strengthening ecohealth expertise in Latin America and the Caribbean

In 2007, in collaboration with the Pan American Health Organization (PAHO), the Organization of American States, and the Inter-American Development Bank, and with the support of the Bill and Melinda Gates Foundation, IDRC supported seven ecohealth studies on the prevention and control of Chagas disease, dengue fever, and malaria in Latin America and the Caribbean. IDRC is fostering a network among the teams to enhance their implementation of ecohealth approaches, provide opportunities for learning and knowledge exchange, and to transform research into action. The projects' common goal is to develop innovative, community-based approaches to disease prevention that will lead to better health policies in the region.

Tackling avian influenza in Asia

Researchers in Asia are also keen to explore the possibilities offered by ecohealth approaches. Since 2005, IDRC has fostered a regional partnership for research on avian influenza H5N1 among research authorities and Ministries of Science, Health, and Agriculture from five Asian countries hardest hit by the current epidemic: Cambodia, China, Indonesia, Thailand, and Vietnam. The Lao People's Democratic Republic is set to join in 2009.

The Asian Partnership on Avian Influenza Research (APAIR) was formed in response to a 2004 initiative of IDRC's Southeast Asia office that sought to foster regional collaboration in the face of the avian flu crisis. APAIR is focusing on environmental and agricultural roots of this new disease and on the implications of draconian control measures on the lives of poor populations in the region. It is the first time Southeast Asian research authorities have collaborated across national and disciplinary boundaries. APAIR has brought down barriers related to language, culture, and politics to assemble five multinational teams of researchers that are generating knowledge on pressing and little understood aspects of the disease: the role of migratory birds and backyard chicken flocks in the spread of avian flu; the socio-economic impacts of the disease and its control measures; and the effectiveness of different measures for disease control at the community level.

APAIR is among the most promising models for translating ecohealth knowledge into public health policy. Not only do researchers benefit from this high-level support on topics of regional importance, but it is also assured that their results go directly to policymakers. Policy influence is a key objective of IDRC's Ecohealth program.



A. Beeche

A rice management specialist explains how the intermittent dry intervals technique can contribute to malaria vector control in Peru.

INFLUENCING POLICY

Policy influence is a means of transforming new knowledge into enduring change. This can be achieved through the continued engagement of policymakers throughout the research process. Ecohealth approaches promote this engagement.

Chagas disease research sways health officials in Guatemala

In Guatemala, ecohealth research on Chagas disease developed an infestation control intervention that is more feasible, less toxic, and less expensive than periodic spraying. This has reached the Ministry of Health, which is now considering implementing an ecohealth approach-based plan for Chagas disease control. The Ministry is motivated by the fact that this approach can improve the quality of life of poor families, enabling them to manage their households and the surrounding environment more effectively. PAHO is also promoting the approach in its regional Chagas disease control program.

The Asian Partnership on Avian Influenza Research focuses on environmental and agricultural roots of Avian flu.



IDRC: P. Bennett

FUTURE ECOHEALTH WORK FOR DISEASE PREVENTION

Ecohealth research helps to prevent infectious disease by generating an understanding of ecosystem factors that influence the emergence and spread of both old and new diseases. New infectious diseases are emerging at increasing rates and antimicrobial and pesticide resistance are on the rise. Through a better understanding of the complex interactions between ecological, economic, and social factors, ecohealth research gets at the roots of infectious disease. In today's globalized world of environmental and social change, IDRC will continue to support innovative approaches and ecosystemic thinking to preventing and controlling diseases before they become entrenched or grow into pandemics.

Ecohealth — short for “Ecosystem Approaches to Human Health” — is a research framework that addresses how human health and environmental quality are determined by complex relationships among different components of an ecosystem. It is used to explore how human health can be protected and improved through more sustainable ecosystem management. Researchers work across academic disciplines to develop sustainable solutions that transcend the health sector. Ecohealth approaches help translate research findings into policy and action. For more information about the Ecohealth Program at IDRC, visit www.idrc.ca/ecohealth.

For nearly 40 years, IDRC has worked in close collaboration with researchers from the developing world in their search for the means to build healthier, more equitable, and more prosperous societies.

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