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SIDE SESSION SUMMARY

Integrating Human Health and Biodiversity: U.S. Government Research, Practice, and Outreach

The U.S. government (USG) recognizes that there are many important linkages between human health and biodiversity. Several U.S. Departments and Agencies have responsibilities related to biodiversity and health (see Table 1), and the USG supports a variety of interdisciplinary programs to better understand these linkages and to assess and manage problems at the health–biodiversity interface. The U.S. Agency for International Development (USAID), U.S. Environmental Protection Agency (EPA), and U.S. Department of State organized a side session at the [Second International Conference on Health and Biodiversity](#) to discuss these linkages and to highlight lessons learned from USG activities.

There were four panelists in the session:

- Lynne Gaffikin described a USAID funded population-health-environment program addressing population dynamics, human health and biodiversity conservation in Madagascar
- Damien Joly described the Global Avian Influenza Network for Surveillance (GAINS) program, funded by both USAID and the Centers for Disease Control and Prevention (CDC)
- Montira Pongsiri spoke about EPA sponsored research projects aimed at characterizing biodiversity and health linkages
- Nina Marano gave an overview of CDC activities and also highlighted lessons learned from the broad spectrum of USG engagement on these issues.

Table 1: Key U.S. agencies and departments whose work relates to human health and biodiversity

U.S. Department / Agency	Role(s) Related to Human Health and Biodiversity
U.S. Agency for International Development	The lead agency for providing foreign assistance and humanitarian aid to the developing world. Supports projects in a variety of COHAB related areas including global health, natural resource management and biodiversity protection, climate change, and disaster relief and response.
U.S. Department of Health and Human Services	The principal agency for protecting the health of U.S. citizens. Contains both the Centers for Disease Control and Protection , which conducts, coordinates and supports infectious disease research and surveillance programs, and the National Institutes of Health , the primary federal institution responsible for conducting and supporting medical research.
U.S. Environmental Protection Agency	Works to protect both human health and the environment by supporting research, developing and enforcing regulations, and engaging in outreach and public education.
U.S. Department of State	The lead agency on formulating foreign policy.

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	Works to advance sustainable development and biodiversity protection through international treaties and organizations, and through public –private partnerships.
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Panelists in this side session were asked to address six issues:

- The health-biodiversity problem they are trying to solve
- The methods and analyses they are using to address it
- The conclusions, policy recommendations, and implementation approaches they are using
- The policy changes, if any, they have helped implement, and how effective these have been at achieving the desired goal
- The major obstacles they have encountered and what they have learned that might be useful to others
- The opportunities that can help them better translate their recommendations into policy action and on the ground implementation, and how the COHAB community can help

Healthy People in a Healthy Environment: USAID support to Madagascar to link health, including family planning, and biodiversity conservation

Lynne Gaffikin (former Population Leadership Program fellow with USAID/Madagascar)

[John Snow Inc., U.S.A.](#)

The problem

Madagascar is well known as a biodiversity hotspot, and is home to many endemic species. However, the country and its inhabitants suffer from cyclones, droughts, flooding, and severe health problems including malnutrition and stunting. The population is rapidly growing at almost 3% a year, straining the country's natural resources. Almost 90% of Madagascar's original forest has been destroyed. Slash and burn agriculture is common, and the deforestation that results threatens biodiversity protection and leads to soil erosion and decreased soil fertility, which contributes to malnutrition and disease. Poor people often live near protected areas and cannot realistically be expected to exercise good stewardship since they have such limited resources. The success of any conservation program will be limited unless basic food security needs are also met. Population growth, which is greatest in rural areas, exacerbates natural resource protection, human health and food security problems, resulting in deepening poverty.

What has been done

In Madagascar there has been a growing recognition of the linkages between population dynamics, health and biodiversity since the 1980s. For over 20 years, programs gradually increased in geographic scale, cross-sectoral nature, and number of engaged partners. From 2000-2004, USAID funded a Community-Centered Population- Health- Environment project in support of a Madagascar program that worked with 120,000 people in 160 communities to promote healthy people and a healthy environment. The program was coordinated by Voahary Salama, a consortium of NGOs in which partners work together to facilitate increased access to quality health care, including immunizations, contraceptives and family planning counseling, and improved nutrition, through promotion of breastfeeding and agricultural and natural resource management guidance. All of the communities where this program worked are in remote areas near sites of biodiversity importance. The three key approaches used to engage communities include the "Champion Community" approach in

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which communities set their own targets and monitor their own progress; the “Farmer-to-Farmer” approach, in which experienced farmers share their knowledge with others; and the Child-to-Community” approach, in which health, agriculture, and natural resource management education is integrated into primary school courses.

Achievements

This program’s integrated approach has been extremely successful, resulting in improvements in family planning, basic maternal and child health and environmental management outcomes – in some cases, measurably more than in communities for which these issues were addressed separately. The program continues as a Malagasy initiative, components of which are supported by USAID and other donors including the government.

Lessons learned: obstacles and factors for success

The absolute amount of funding and the short (generally 4-year) time cycle over which projects are typically funded limited the scale at which this project could operate, and impacted effectiveness of the program in hard to reach communities with several competing development priorities. The engagement of the Malagasy government in promoting integrated health and environment policies and programs at the commune level will hopefully lead to improved stability of program support. Longer-term funding would reduce turnover of individuals playing key roles in program implementation. This would both help develop a more solid base of knowledge and experience and would foster the development of stronger communication networks. Another difficult, though probably unavoidable, aspect of the work was helping to coordinate a program of this scale across several landscapes in different geographic regions.

An important factor for success was beginning the work with short-term interventions which had clearly achievable results, referred to as “small doable actions.” These initial small successes are critical to achieving full community engagement, trust and support. As such, it is also important for individual communities to be directly involved in setting their own achievement targets.

A second key factor allowing for sustainability of successes achieved has been the support and engagement of the government, including the President of Madagascar. In the development plan for the country, called the [Madagascar Action Plan](#), biodiversity protection, improved health and increased usage of family planning are among the factors considered critical to the foundation for economic success. The President committed to increasing the amount of protected areas in Madagascar from 1.7 to 6 million hectares (the Durban Vision) and to increasing universal access to family planning, as measured by an increase in the contraceptive prevalence rate from 18% to 30%

A final important factor in achieving improvements in health and contributing to biodiversity protection is the integrated nature of the program. Many communities in need are in extremely remote areas that are physically difficult to access. Funding for development projects in those areas is limited, and this is unlikely to change. Development of integrated initiatives allows limited financial resources to be optimized by eliminating redundant costs such as transportation.

Next steps

This program has been quite successful at improving both human health and biodiversity protection. The next actions should be to scale up program strategies and interventions by building on the government’s Madagascar Action Plan, promoting inter-ministerial events,

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developing cross-sectoral planning platforms and supporting local and regional development planning processes. In addition, the success of integrated community-based approaches could be improved by increasing long-term support to on-the-ground NGOs, evaluating programs for cost-effectiveness, and using these analyses to optimize program design and management.

[Global Avian Influenza Network for Surveillance \(GAINS\) Program](#)

[Damien Joly](#)

[Wildlife Conservation Society, U.S.A](#)

The problem

Many of the diseases of greatest concern to humans are those which are acquired from other species. As humans and animals come into closer and more regular contact, the number of such diseases will increase. In some cases, the goal of protecting human health may be best served by monitoring wild animal populations for diseases which could potentially be transmitted to humans and cause serious harm. Avian influenza (AI) is a zoonotic disease of great concern because of its high pathogenicity in rare instances of bird to human transmission. The possibility that AI could mutate to a much more dangerous form that is transmissible from human to human, and the severe economic impacts (through mortality of captive birds, or culling of whole populations to reduce risk of spread) that often result when it is detected makes it imperative that we monitor for this disease in animal species. AI also can impact avian biodiversity by decimating wild populations. Dealing with AI effectively requires a good understanding of its epidemiology. Bird migration patterns, the ability of the virus to undergo cross-species transfer, and the overall low frequency of the virus make this a complex problem.

What has been done

The Global Avian Influenza Network for Surveillance (GAINS) program was established to improve understanding of the epidemiology of AI viruses in wild and captive birds and to promote sharing of data among a wide range of partners. GAINS has developed the Wildlife Information System for Disease Observation and Monitoring (WISDOM) data management system, which is used to enter and geospatially explore data, and which can link with other online data sources and tools. GAINS has spent considerable effort to build an expansive network of partners, including universities, NGOs, and government agencies, which work together to contribute to the GAINS global database of AI data.

What has been achieved

Although the GAINS program started just recently in June 2006, it already includes more than 20,000 collection samples with observations of more than 100 million birds, with data from 33 countries. GAINS also supports a Field Training Unit which has trained more than 1000 individuals in sampling and data collection. There are currently 23 partner organizations, including US Federal agencies (e.g. USAID, CDC, and the U.S. Department of Agriculture), international bodies (e.g. Food and Agriculture Organization of the United Nations and the Convention on the Conservation of Migratory Species of Wild Animals), academic institutions (e.g. Veterinary Medicine Wildlife Health Center at University of California at Davis and the University of California at Los Angeles), and NGOs (e.g. Wildlife Conservation Society and Birdlife International).

Lessons learned: obstacles and factors for success

Concern about intellectual property rights can deter parties from participating in networks such as GAINS, but this is a surmountable obstacle. While GAINS is open-access and

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encourages full data sharing, it also gives individuals adding observations to the database some ability to control who can view these data.

Prior to this program, some disease data were being collected by federal, state, and local governments, as well as academic researchers and NGOs. However, worldwide AI is not a problem any single organization can effectively address on its own. The large network of GAINS partners is critical because it allows more data to be brought together, increases combined lab capacity to analyze samples, and provides an interface which allows these data to be systematically analyzed. Nevertheless, there is a backlog in analysis of data samples because there is limited global laboratory capacity to handle the volume of samples, and samples from wild bird populations are often given a lower priority than domestic bird samples.

Next steps

GAINS has developed a strong foundation for expansion, including extensive wildlife health expertise, IT infrastructure, and a large international network of partners. Future steps could involve expansion to include additional partners and/or to look at other important zoonotic diseases.

[Biodiversity and Human Health Research Program](#)

Montira Pongsiri

U.S. Environmental Protection Agency, U.S.A.

The problem

Although it is well known that changes in biodiversity can profoundly impact the ability of ecosystems to provide basic human necessities like clean water, energy and food, it is less well understood how changes in biodiversity can affect transmission of infectious diseases to humans. The U.S. Environmental Protection Agency (EPA) is interested in exploring these connections by better understanding the underlying mechanisms of infectious disease emergence and the role that changes in biodiversity - specifically changes in the abundance, composition, and distribution of animal hosts and vectors - may play. Such research is critical to helping us better understand how to reduce disease emergence or re-emergence, but there are few international organizations funding interdisciplinary research, and even fewer on biodiversity and health. EPA has developed a new interdisciplinary research initiative to characterize the qualitative and quantitative links between anthropogenic stressors (such as deforestation and climate change), changes in biodiversity, and infectious disease transmission to humans, and to use this knowledge to inform health and conservation policy.

What has been and is expected to be done

EPA is sponsoring pilot and long-term interdisciplinary research projects that will characterize the scientific relationships between health and biodiversity. Dr. Pongsiri discussed two new projects. The first project, a collaboration between EPA, Yale, NASA Ames, and CDC, is using earth observations and field data to spatially model Lyme disease risk in the U.S. The second project, a collaboration between EPA and the Smithsonian Tropical Research Institute (STRI), will monitor mosquito species diversity across a landscape gradient in Panama, adding to our understanding of the ecological mechanisms that affect the distribution of mosquitoes that act as disease vectors. This project is leveraging resources by using the Smithsonian Global Earth Observatories (SIGEO) research platform as well as working with the Smithsonian's Mosquito Barcoding Initiative, which is developing rapid and accurate tests for species identification.

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What is expected to be achieved

The outcomes the EPA hopes to achieve from these and other projects include 1) an improved understanding of mechanisms linking health and biodiversity, 2) the development of tools to help forecast risks to health and biodiversity, 3) information that could be used to value the health benefits of conserving biodiversity, 4) the development of strategies and communications that will encourage changes in human behavior that will reduce risks to health and biodiversity, (5) improved analysis of land use planning, (6) and improved coordination between health practitioners and environmental decisionmakers.

Lessons learned

While the Biodiversity and Health research projects have only recently begun, EPA has developed an innovative approach based upon bringing together researchers from multiple disciplines to integrate data on ecology, health, and the social sciences, while simultaneously engaging with decisionmakers to maximize the utility and impact of this research. This approach takes a more holistic view of the human-environment-disease picture and can help produce scientific knowledge that better and more quickly informs decisions on pest management, land use guidance and human behaviors so that they will be more protective to health and the environment.

Synthesis Comments: Strategies for Success

[Nina Marano](#)

Centers for Disease Control and Prevention, U.S.A.

Dr. Marano's work at the CDC is focused on preventing the importation of zoonotic pathogens transported by animals across US borders. Population growth, increasing demand for animal protein, and loss of wildlife habitat will lead to increased human and animal contact, which may result in new pathogen exchanges between animals into humans. Consequently, disease surveillance and wildlife health monitoring are essential. Protecting health and biodiversity will depend on developing strategies and policies based upon an improved understanding of the linkages between public health, animal health, and ecological health.

Dr. Marano identified "Strategies for Success," based on lessons from the USG activities described above as well as from her work at CDC:

- Partnerships are critical. Invest the time needed to build strong partnerships and alliances, and think broadly about which organizations might be good partners. The presence of local champions, sometimes even a single individual, can be tremendously important to project success or failure. Leverage partner resources, including skills and experience.
- Always keep cost-benefit assessments in mind. Evaluate the expected cost-effectiveness of proposed activities. Develop meaningful indicators that will allow you to assess how effectively the project has improved biodiversity and health.
- Continuity of funding can greatly improve outcomes. Convince managers to fund proactively and over long time periods.

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- Surveillance systems for monitoring the health of people, environment, and animals are important *now*, and will become more important as climate changes. Surveillance systems should be simple, accurate, sensitive, timely, and flexible.