

Guillermo Mesa: An important point to underscore is our action research approach: MINSAP, in consultation with other institutions, adopts health measures based on research conducted by the Climate and Health Project, led by Dr Ortiz. Meanwhile, new research is consulted to continuously adjust and improve health actions. This is important because it means current climate change findings, especially those related to population health vulnerability and variation in the epidemiological picture, can be integrated into disease prevention, health promotion and messaging. In 1995, after the first International Conference on Disaster Reduction, we started putting national plans in place in, including a vulnerability reduction program for all health institutions across the country. You have to remember that because our health system is universal and public, we're obliged to guarantee the financial, material and human resources to protect the institutions providing public health services population wide, under all circumstances.

But what about prevention, which implies much more than risk reduction? So now, we're pursuing a two-pronged approach: we look at how to safeguard health institutions but also how to protect people's health, through ongoing actions for prevention, mitigation and adaptation to climate variability and shocks. To achieve this, we rely on scientific research, multifactoral analyses, and intersectoral collaboration. This is another important distinction of our approach: while many entities and governments focus on response—and don't get me wrong, we work diligently in this area—we are also dedicated to prevention.

MEDICC Review: *Prevention is one of the cornerstones of the Cuban health approach. Can you elaborate on how this plays out in terms of climate change?*

Guillermo Mesa: Since the 1960s, Cuba has had national programs for prevention and control of infectious diseases, including a national vaccination program for preventable diseases such as polio, a malaria eradication program, and so on. These have been effective tools in controlling disease transmission, and also serve as best prevention practices for other countries implementing climate change mitigation policies. But climate change is forcing us to develop new strategies. Looking at extreme weather events, like hurricanes for example, where Cuba has vast experience, we need to develop a culture of prevention, what we call a culture of 'disaster reduction.' This involves an integrated, comprehensive and ongoing effort by all society to mitigate and adapt to future extreme weather events, specifically, but also climate change in general.

Paulo Ortiz: For us, prevention is a key priority. When we're looking at climate change, one of the major factors we incorporate into our research and analyses is the variability of human behavior in response to climate variability and health. This allows us to better prepare and prevent health problems.

MEDICC Review: *The impact human behavior has on climate change and health is at once both polemic and extraordinarily urgent.*

Guillermo Mesa: Our prevention strategy is based on our vulnerability studies—including joint research undertaken by MINSAP and CITMA within the Environmental Control Program—which look at the intersection of environment and health in all its components, including the anthropogenic component. From a risk

perspective, climate change is a phenomenon that affects people in many ways. So when assessing risk, it's important to consider how populations are vulnerable to climate change and which sectors of society are most vulnerable. This must include an analysis of human behavior, our culture, habits, and conduct—all of these are implicated in climate change and health.

Take the very simple example of people who know the benefits of early evacuation in a hurricane, but wait until the last minute to get to safety or don't evacuate at all. In my opinion, the evidence base related to the human factor and climate variability is limited; we're not seeing sufficient or enough high-level scientific research on this issue and certainly not enough research with an intersectoral, interdisciplinary approach. Once we have the evidence, we'll be able to design more effective measures and policies to address this. We're not there yet, but we're working towards it.

Altering people's behavior is very difficult. Each sector plays its part—education, health, industry, even sports and now, the emerging small business sector—but improving our institutional response and preparing our population is something we have to work on every day. It's not a simple formula.

Paulo Ortiz: This issue of achieving behavior change can't be overstated. We've had some successful experiences: for example, in our nationwide information campaign and policies designed to encourage people to save electricity and water. This program is over a decade old and is showing results. Now we're incorporating initiatives related to climate change, emphasizing early education. For example, this weekend is the finals of the national children's drawing contest dedicated to water—how to save and treat water, how to modify wasteful behavior, water as an irreplaceable natural resource, etc. There's also a disaster preparedness program in every Cuban school.

Guillermo Mesa: Working closely with educators is an important part of our intersectoral approach. The early education curriculum, but also in secondary schools, should move beyond hurricane preparedness to directly incorporate climate change and health. It should be part of every Cuban student's education.

MEDICC Review: *How resilient would you say Cubans are in the face of extreme weather events and climate change?*

Guillermo Mesa: I think resiliency is a Cuban tradition. From the *cimarrones* [escaped slaves who established autonomous settlements in Cuba—Eds.] to the *mambises* [Cubans who fought for independence from Spain in the 1800s—Eds.] and right up to today, with the embargo, Cubans have had to be resilient and help each other overcome obstacles. During and after hurricanes, for example, Cubans' resilience is reinforced by the preparation they receive and the confidence they have in our risk reduction strategy, combined with tightly knit family structures, the strong social fabric of our society, and the institutional support provided.

In 2008, we instituted the national Disasters and Mental Health program, since resilience is implicated before, during and after extreme weather events. This program is designed to ensure healthy psychological and emotional recovery and should be part of climate change and health strategies everywhere. In 2010, we implemented a modified version of this program after the earthquake in Haiti, providing specialized psychological and psychiatric

services, plus cultural activities, in an effort to boost resilience in that very difficult post-disaster situation.

From the moment we wake up in the morning, life throws us all kinds of challenges and difficulties. So we need tools to confront and overcome them. The same holds true—even more so—in the face of extreme weather events. If people don't have the tools, we start to see the first effects on their mental health: anxiety, nervousness, insomnia. These can develop into other conditions—diabetes, hypertension and substance abuse, increasing morbidity and in the worst cases, mortality too.

MEDICC Review: Do you have a sense of what climate change is costing the health system?

Paulo Ortiz: We did a study on climate change and the cost to the health system and the conclusion was, without doing anything, if we just continue on without implementing any mitigation or adaptation policies, climate change will cost us more than US\$250 million. But we have to add to that the cost of new programs, policies and actions—we're undertaking that research now. There's a lot of work to be done.

We also know that prevention pays off in the end: we implemented our national meningococcal vaccination program and conducted a rigorous study measuring how much it would cost to implement versus what an epidemic of the disease would cost. We concluded it would have been ten times more expensive to confront an epidemic than to vaccinate. This is the type of best practices we're talking about developing around the issue of climate change. Moving forward, we need to do cost/benefit analyses for all types of preventive actions, with climate change in the mix. We've still got a long way to go and a lot of research to do, especially since the environment is one of those issues with tangible and intangible costs—and some of these are unquantifiable.

Guillermo Mesa: Exactly. Will our grandchildren be able to play at the beach or swim in the water—how do you quantify that?

MEDICC Review: You both have underscored the importance of research. Can you tell us what Cuba is doing now around climate change and health research?

Paulo Ortiz: In mid-April, policymakers from MINSAP and CITMA met to fine tune the national action program related to climate change and health, to improve prevention policies and prioritize areas of research. This presents many challenges, including how to finance scientific training and studies and building the evidence base to design and implement appropriate actions. Studies on climate change and health are still fairly empirical, but the effort to improve high-level scientific research was helped by the publication in 2010 of *A Human Health Perspective on Climate Change* [published by the Interagency Working Group on Climate and Health, a US-based consortium of federal agencies and organizations convened by the National Institute of Environmental Health Sciences—Eds.] which outlined research needs on the human health effects of climate change. That document grouped problems by epidemiologic categories, suggested lines of research, and recommended drawing up specific indicators to inform that research. This last is particularly important: we are guilty of relying on traditional indicators, rather than on those particular to climate change and health.

MEDICC Review: Are Cuban researchers currently publishing in international journals on the issue?

Paulo Ortiz: We are. Even in the difficult economic situation in which we find ourselves, we're determined to publish in an effort to forge solutions. I have to admit that oftentimes as scientists, we are dreamers and too romantic; in certain measure we're too removed from the needs of the country. Luckily, CITMA, together with MINSAP, has prioritized climate change and health as a national program—this political will provides impetus for research and action. We are focused on health problems in the Cuban context (acute respiratory infections; acute diarrheal illnesses; and dengue, for example), and on developing relevant best practices. This latter is important, because much of the financing for and knowledge about best practices concerning climate change and health are less relevant for the most vulnerable contexts. Cuba's best practices, like those mentioned by Guillermo, are not as well known because, this issue of *MEDICC Review* aside, many publications don't accept Cuban findings for reasons having nothing to do with science. But climate change knows no borders: the entire world is facing this challenge in one way or the other, so it's important that different contexts and approaches are reflected in the literature. And while one context may not be facing the problem today, they may be facing it tomorrow. There are now *Aedes aegypti* [the mosquitoes that transmit dengue—Eds.] in various US states, for example. Still, most of the scientific literature, the overwhelming majority of which is in English—comes from one perspective: developed countries.

Guillermo: In a certain sense, the issue of climate change has become too elitist—it has to be demystified. Remember it was Al Gore who sent the message of climate change around the world. But what has happened since? The issue has become co-opted by politicians, scientists and industry. For me, it's clear that measures taken to mitigate and adapt to climate change—whether they're good, bad or mediocre—have to actively involve the population, people and their communities. In my opinion, if climate change continues to be approached in this elitist, non-participatory way, we're not going to see the positive results adaptation and mitigation measures are designed to achieve.

MEDICC Review: You have had the opportunity to collaborate with colleagues around the world and conduct research outside of Cuba. What have you observed and learned about climate change and health in other developing contexts?

Guillermo Mesa: We've arrived at a point where the impact of climate change, how to adapt to it and mitigate its impacts, is on the global agenda. I think that a challenge for developing countries is coordinating their national strengths, skills and data and using them effectively. A lot of times, very good research is being undertaken but in a fragmented way; different researchers aren't aware of what others are doing.

Coordinating research is a first step for each country to develop a national action plan in which different sectors work together towards a common goal. One of the great advantages here in Cuba is that we have a unified, national program that makes efficient use of our resources and skills. Another challenge is prioritizing climate change actions for population health, in the face of competing interests. One thing is for industry to develop and be profitable, but it should also be working towards improved health and quality of life for those employed by and surrounded by that

industry. Obviously, this is a limitation in many countries—you have health and well-being separated from the bottom line.

Paulo Ortiz: Working together, across the region, to improve the health of our populations was underscored recently at the Summit of the Americas. The UN Economic Commission for Latin America and the Caribbean has also named Cuba official advisor on climate change and health research for Central America and the Caribbean. This appointment recognizes our methodology and research, which, in fact, is also relevant for parts of the United States: tropical storms and hurricanes that hit the Caribbean, for example, also present risks to the US Gulf states.

MEDICC Review: And with developed nations—specifically the United States, which is currently negotiating full diplomatic relations with Cuba—are there experiences and lessons there?

Paulo Ortiz: I've worked with many colleagues from the United States and we've debated the different approaches in our countries—especially given the different level of resources we have. And I've concluded that one of the major differences is that our development model is centered on human development; that is to say, the priority driving our work is not to make more and more money, but to provide benefits to the population. In terms of climate change, this is extraordinarily relevant because the reason countries don't sign the various accords and industry doesn't adjust their practices is because they approach it with the question 'how much do we stand to lose, financially, if we sign these accords or change our behavior?' And this is quite astounding considering that climate change could threaten human existence: we're not even talking about health and well-being now, we're talking about sheer existence, and even small changes in behavior can have a big impact. The other big differences among countries relate to organization of health services. Clearly, every country and context has its own way of organizing its health system, but whatever the organization, we see a lot of fractured/divided/uncoordinated

actions and policies when confronting the same health problem. We saw this with the Ebola response for example.

MEDICC Review: Are there specific areas where Cuba and the USA could collaborate around climate change and health?

Paulo Ortiz: We have a long history of collaboration with the United States on this topic—even in a very difficult political situation, we've shown we can work together. For instance, our Institute of Meteorology and the Miami Hurricane Center have worked on bilateral training, hurricane tracking and prediction: after all, this is something that affects both sides of the Florida Straits. Political barriers have handicapped knowledge sharing, in this discipline as well as others. Nevertheless, we've maintained collaboration and links—sometimes tense, sure, but we've maintained them—regardless of political differences. What is happening now is an opening, a convergence towards more collaboration. In other sectors and around other issues, we're just getting started, but in terms of climate change, we have things to learn from the US experience and in turn, they have something to learn from ours.

Guillermo Mesa: Another area where we can collaborate is training of human resources—the experience of the Latin American Medical School is a case in point: 104 students from the United States have received their medical degrees from this school. These young people lived a minimum of six years in Cuba and experienced the entire process of hurricane risk reduction, preparedness and recovery. Moving forward, I think training and joint research dedicated to climate change and health are interesting avenues of bilateral collaboration to explore. Of course, we're talking about two very different types of health systems, but around the issues of individual and community preparation and mitigation, I think we can collaborate. Other areas of shared interest and benefit include learning from intersectoral approaches, data management and how to communicate important information to the general public. 