UPCOMING EVENTS

NCAR will be closed Monday, January 19th in observance of Martin Luther King Day

Dr. Chris Barker, a professor at the University of California, Davis will be the invited speaker for the Thompson Lecture Series the second week of February. More details will follow soon.

Research Reviews: January 14th in the ML Damon Room. Speakers are Angie Pendergrass, Corentin Herbert, and Mark Raleigh

Learning By Observing: How Can We Improve Academic/Government Collaborations by Micah Hahn

Chikungunya is a viral disease that is caused by the bite of an infected mosquito. Symptoms of the disease include fever, joint pain and swelling, muscle pain, headache, and rash. Most people infected with the virus feel better within a week, but some people experience joint pain for months. Historically, Chikungunya is a disease that occurs in Africa, Asia, Europe, and the Pacific Islands, but in January 2013, the first locally-transmitted case of Chikungunya in the Americas was identified on St. Martin Island in the Caribbean. Since then, this Chikungunya outbreak has continued with over 1 million cases identified in 41 countries or territories as of mid-December 2014, including over 2,000 cases in the United States. Most of the U.S. cases to date are “travel-associated” cases, meaning that the cases are in people who have traveled to a country where local transmission is occurring, were bitten by an infected mosquito, and then returned to the U.S. and developed symptoms. However, there have been 11 cases of locally transmitted Chikungunya in Florida in 2014. The mosquitoes that transmit Chikungunya, Aedes aegypti and Aedes albopictus, live in the U.S., so the assumption is that it is only a matter of time before Chikungunya moves into the U.S. and causes more widespread outbreaks.

In order to prepare for a future with Chikungunya transmission in the U.S., scientists are trying to model the spread of the virus to predict when, where, and how intense future outbreaks will be. I recently had the opportunity to attend a meeting that brought together academic disease modelers and public health practitioners from the Centers for Disease Control and Prevention (CDC) to discuss the creation and implementation of this modeling framework. The idea is to create a dynamic model of the disease spread in countries where the disease is already being transmitted, use air travel data to predict when and where cases will likely be imported into the United States, and then use information like cli-
mate data, human population density, and the mosquito distribution to forecast the potential for new local cases if an infected person flies back home to say, Denver. Although it seems like academics and public health practitioners would collaborate on a regular basis, this has not been my experience. After the meeting, I took an opportunity to reflect on why there seems to be a disconnect between academia and government public health work, based on the dynamics of the meeting and my experience working at NCAR and the CDC over the past year.

One of the obstacles for collaboration that was most apparent in the meeting was the use of jargon. It has been very interesting for me to be the liaison between academic scientists at NCAR and public health practitioners at CDC during my postdoc. My NCAR and CDC collaborators have worked together previously and have honed their interdisciplinary communication skills. However, despite their experience, there have been occasions where I could tell that confusion about a question or concept were discussing was a result of mixed terminology. Once there was clarification about definitions, the conversations became more productive and inclusive. The Chikungunya meeting brought together new collaborators who did not have the luxury of a long-standing professional relationship to develop a common language. Although progress was made on the modeling project over the course of the three-day meeting, there were times when the modelers got wrapped up in a conversation about the nuances of model development or data sources that left everyone else trying to follow along. Although it may have been more convenient for the modeling group to converse in their “native” language, they sacrificed the benefit of having the meeting with the Chikungunya experts, who could not follow all the details of the conversation. In the long term, the jargon-laden, somewhat exclusive, discussion may have set the stage for future interactions where the public health scientists feel unnecessary or burdensome due to their need for “translation.” Conversely, consciously creating an environment where all participants feel included and can actively contribute, builds trust, respect, and mutual understanding – all key components of a successful interdisciplinary relationship.

Second, I have observed that there is a tendency for academics to approach research questions with the goal of understanding every detail of a system while sometimes, the needs of people setting public health policy or implementing interventions are relatively simple. For example, my current postdoctoral work is on predicting human West Nile virus outbreaks using climate data. When I first began working on this topic, I considered the possibility of trying to predict the number of human cases in a county before the summer transmission season. Now that I am much more familiar with the complexity of the transmission cycle, which includes mosquitoes, birds, and humans and is affected by many drivers in addition to climate -- such as immunity in the bird and human populations, mosquito control, and land use -- I realize that we will not be able to model the disease at that level of detail using only climate data. However, this is OK! My group at the CDC is looking for data-based, broad-stroke forecasts that can be used to make general statements about WNV risk regionally. County-level predictions would likely be too uncertain to publish as a government forecast, so delving into modeling with that level of detail, while interesting, would not be as useful from a public health perspective.

A similar discussion occurred at the Chikungunya
Academic/Government Collaborations (continued)

meeting with the modelers. During the part of the day when the public health participants left the meeting, the disease modelers discussed sources of data for their models. It was apparent that the level of detail in their proposed model was likely more complex than what the CDC participants had in mind. In addition to differences in the spatial resolution of model output, an additional consideration for public health practitioners is that their audience is generally the public, whereas academics are often explaining their results to academic peers. As a result, the process and inputs used for modeling work for public health applications needs to be straightforward enough that they can be explained to a lay person, which is not often necessary for research with the final destination of an academic journal.

Finally, academic institutions and government agencies tend to operate on different timelines. Academics generally have the leeway to build research projects over multiple years and although they are dependent on successful grant writing to bring in research dollars, they are generally only subject to time restrictions set forth by grant agencies in terms of deadlines for projects. Government agencies, on the other hand, request their budgets many months in advance, must spend their funds within the confines of a fiscal year, and have little to no flexibility in how their funding is spent once it has been provided under specific line items. For example, CDC expects new Chikungunya cases next spring when the mosquito population starts to increase. However, the modeling work that was being discussed at the meeting could be the start of a much larger research program that takes place over multiple years.

 Obviously, the use of jargon, misunderstanding regarding the level of detail needed, and misaligned timelines are not the only obstacles to successful academic/government collaboration, nor are they insurmountable. The first step is to recognize these discrepancies, and then work as a team to find solutions that meet the needs of both organizations. Successful public health policies require data-driven evidence, and academics are realizing the substantial impact their science can have when applied to real world issues. Working in the Research Applications Laboratory of NCAR has provided me the opportunity to work with scientists who are interested in applied research and are a model for interdisciplinary collaboration. I hope to carry on this research ethic and continue working as a bridge between science and public health applications.

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