The spread of many diseases in Africa is linked to patterns of wet and dry weather. For instance, at the margins of transmission, malaria can spread through lowland arid and semi-arid regions when rainfall increases or through cooler highland areas when temperatures warm. Bacterial meningitis can spread rapidly in the dusty dry season in the semi-arid belt between Senegal and Ethiopia. Epidemics of these and other climate-sensitive diseases can significantly affect the health and productivity of entire regions.

The earlier health experts know about seasonal weather extremes that can lead to disease outbreaks, the earlier they can respond, bringing in insecticide to kill mosquitoes or stockpiling meningitis vaccine. “Seasonal forecasting is not just an academic exercise,” says Simon Mason, a research scientist at the International Research Institute for Climate and Society (IRI), which is known for its expertise in forecasting and its applications to agriculture, health and other sectors.

Seasonal forecasting works only in certain regions of the world, like the tropics, where rainfall is significantly affected by ocean temperature. Scientists can predict air temperature and rainfall extremes of approaching seasons up to six months in advance. When an already warm ocean warms up a bit more, evaporation can increase significantly, making more water available to fall as rain. If the same ocean cools, evaporation drops and there is less water for rain.

Scientists at IRI are helping put forecasting to work in Ethiopia, thanks to a grant from Google.org’s Predict and Prevent Program. "We’re building capacity in the climate community to help the health community," says Madeleine Thomson, a senior research scientist at IRI. "And we’re building capacity in the health community so they know what they need to ask for from the climate community."

Judy Omumbo, an associate research scientist with experience in disease risk mapping, works on the ground to help local health teams use climate forecasting tools and acquire the data they need. “A lot of monitoring information is not available in the public domain,” she says. At the same time, Tufa Dinku, also an associate research scientist at IRI, is working with Ethiopia’s national meteorological service to put together a 30-year time series of rainfall and use satellite data to fill in the many data gaps not covered by existing rain gauges.

Malaria and meningitis alone kill thousands of people each year across sub-Saharan Africa. They can also have significant effects on already weakened economies and health systems. Implementing better seasonal forecasting systems and teaching people how to use them are important steps in the fight against these diseases.

Each year, IRI hosts a training session in New York for health and climate professionals from around the world. “IRI is trying to build a climate-smart community—to create a health community that can use climate information to promote good health,” says Thomson.