Climatic Influences on Air, Soil, and Tree *Cryptococcus gattii* Populations in Vancouver Island, Canada

**Background**

Vancouver Island, Canada reports the world’s highest rate of human *Cryptococcus gattii* (*C. gattii*) cases. Humans incidentally inhale propagules and the fungus causes ~25 illnesses and 4 deaths per year. The goal of this study was to determine the relative importance of biophysical conditions for monthly *C. gattii* dynamics from the air, trees, and soil. The results provide insight into periods with elevated risk of contracting the disease. This information is difficult to identify from existing surveillance systems.

**Results**

*Longitudinally sampled plots*

- **Soil**
  - Warmer T° → *C. gattii* ↓
  - Higher Wind Speed → *C. gattii* ↓

- **Tree**
  - Unrelated to weather, however temporally autocorrelated

- **Air**
  - Greater Solar Radiation → *C. gattii* ↑
  - Wind speed, moderate → *C. gattii* ↑
  - Wind speed, strong → *C. gattii* ↓

*Newly sampled plots*

- **Soil**
  - Warmer T° → *C. gattii* ↓
  - Summer, Fall → *C. gattii* ↑
  - Temporally autocorrelated

- **Tree**
  - Warmer T° → *C. gattii* ↓
  - Greater Solar Radiation → *C. gattii* ↑
  - Higher Wind Speed → *C. gattii* ↑

**Discussion**

Geographic areas and periods of time with elevated temperatures decreased *C. gattii* tree isolations and soil concentrations. Collectively, our results provide insight into *C. gattii*’s life cycle. Both trees and the surrounding soil appear to act as *C. gattii* reservoirs. Wind may be a key process transferring *C. gattii* from the soil, into the air, and onto trees in the wider study area. The highest airborne *C. gattii* risk is from August-October on sunny days with moderately windy conditions. The greatest risk of contracting *C. gattii* from the soil is on relatively cool June and July summer days.

Christopher K. Uejio, Department of Geography and Program in Public Health, Florida State University, cuejio@fsu.edu, @ckuejio