

HIV Prevention Modeling at the Centers for Disease Control and Prevention

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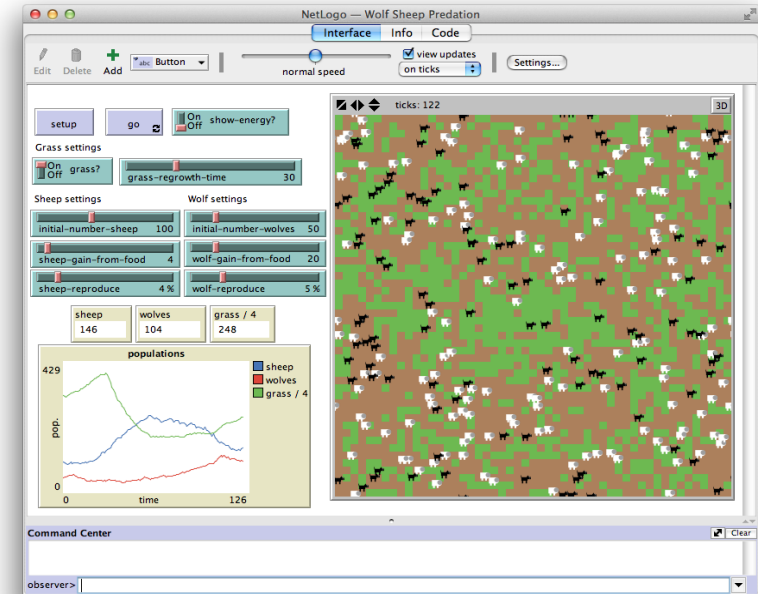
Prevention Modeling for HIV

- Apply quantitative science to prevent HIV infection and reduce HIV-related illness and death
- Focus on effectiveness of prevention efforts
 - HIV testing
 - HIV care engagement/retention
 - Treatment as prevention
 - Pre-exposed prophylaxis (PrEP)
 - Behavioral interventions



Agent-based Model

- **Progression and Transmission of HIV (PATH)**
 - Track disease progression, treatment, and transmission at individual level
- **Estimate HIV transmission rate**
 - Population risk group
 - HIV care continuum
 - Age group
- **Replicate transmission networks/clusters**



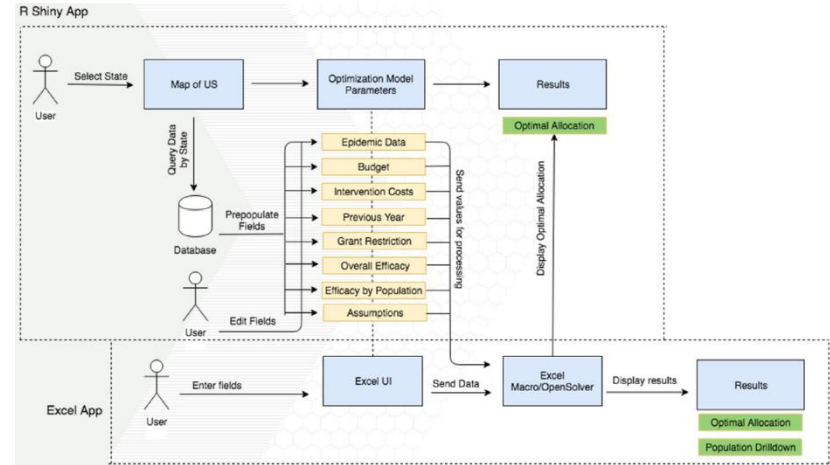
Compartmental Model

- **HIV Optimization and Prevention Economics Model (HOPE)**
 - Population-level analysis
 - age group, risk level, transmission group, sex, race/ethnicity
 - System of differential equations solved in Matlab
- **Effects of Reaching National HIV/AIDS Strategy goals**
- **Analyze the cost effectiveness of different interventions**
 - Increasing testing frequency
 - Increasing adherence to HIV treatment
 - Increasing coverage of PrEP

Optimization Model

■ Resource allocation

- Excel-based tool for state/local health departments to allocate HIV funding
- Input:
 - Efficacy of intervention programs
 - Epidemiological/clinical data
 - Budget
- Use linear program to find the optimal fund allocation to each intervention program



Thank you!

For more information:

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Findings and conclusions in this presentation are those of the author and do not necessarily represent the views of the CDC