COVID-19 AGENT-BASED SEIRD MODEL:
EFFECTS OF CONTROL MEASURES RELEVANT TO MIGRANT AND SEASONAL FARMWORKER COMMUNITIES

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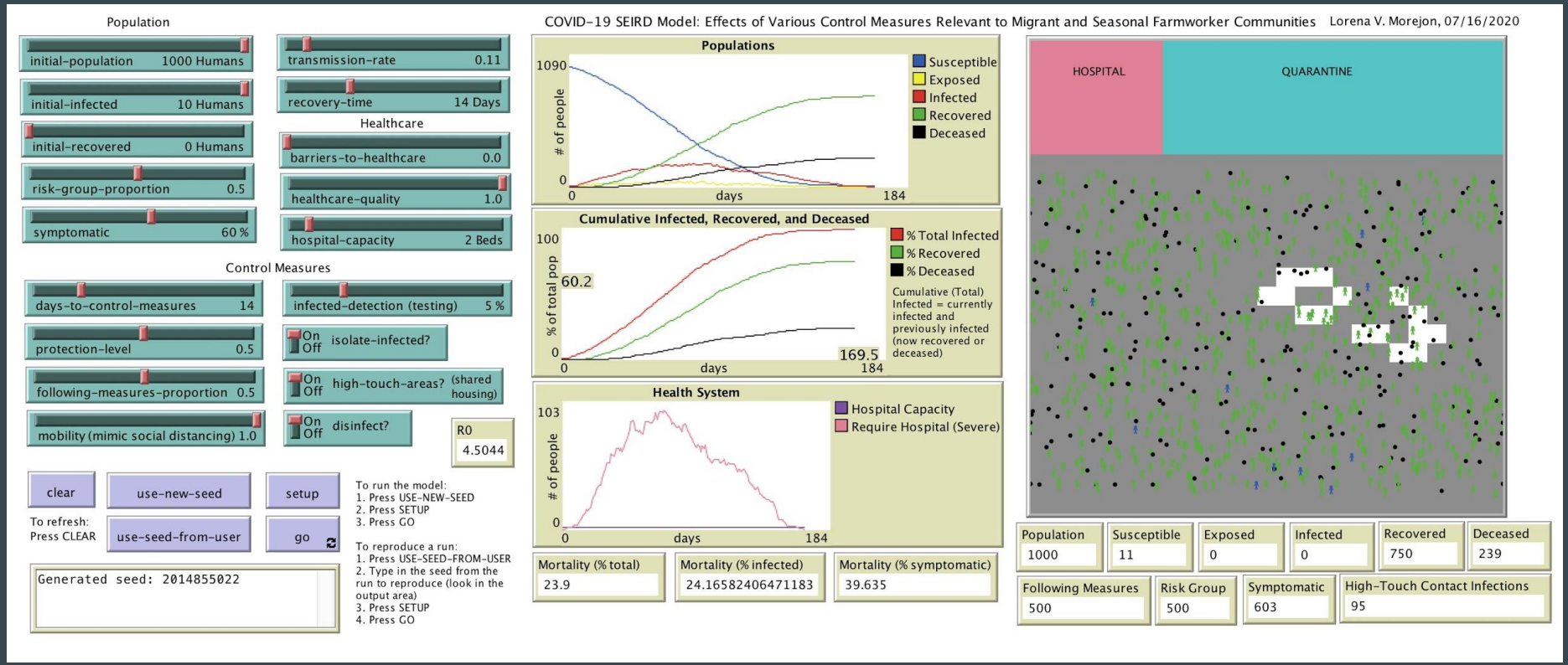
Farmworkers in the COVID-19 Pandemic

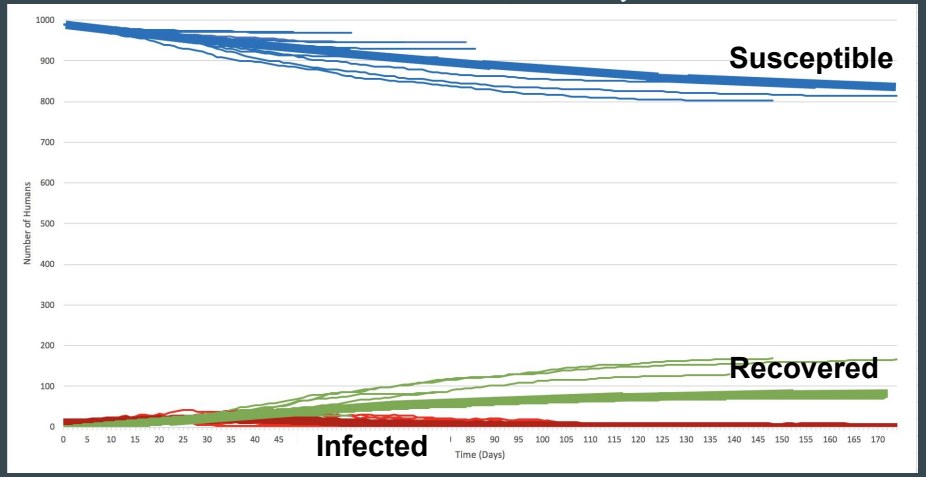
- Challenges include:
  - Barriers to healthcare
  - Difficulty social distancing
  - Insufficient testing of workers
  - Overcrowded housing

The Model: Susceptible, Exposed, Infected, Recovered, Deceased

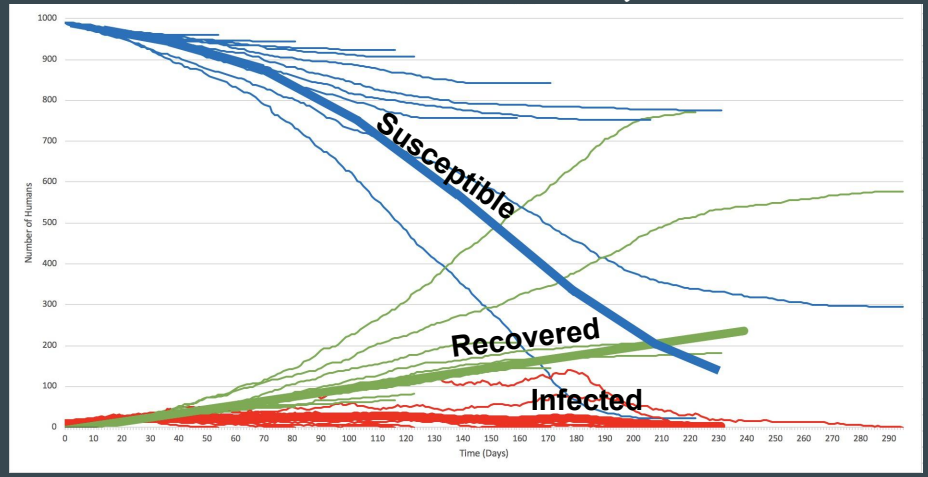


Transmission Probability SIR Model

Transmission Probability = 0.1



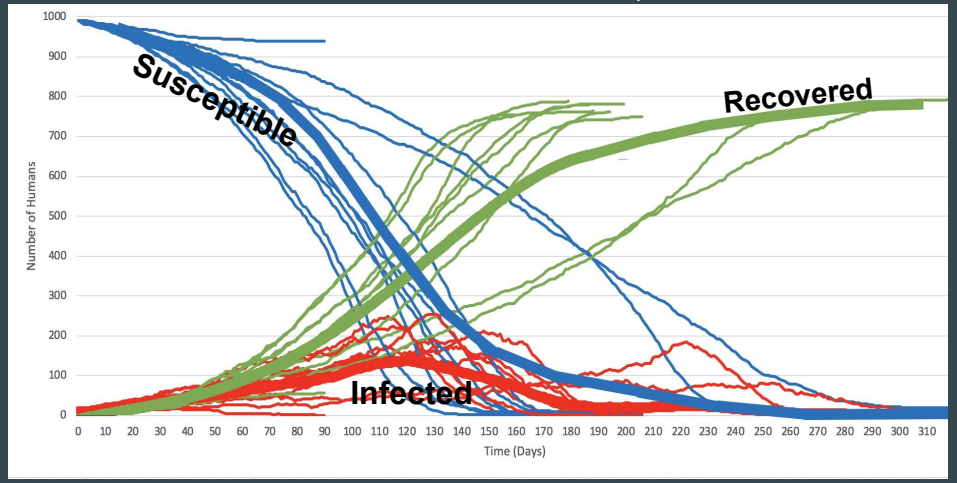
Transmission Probability = 0.11



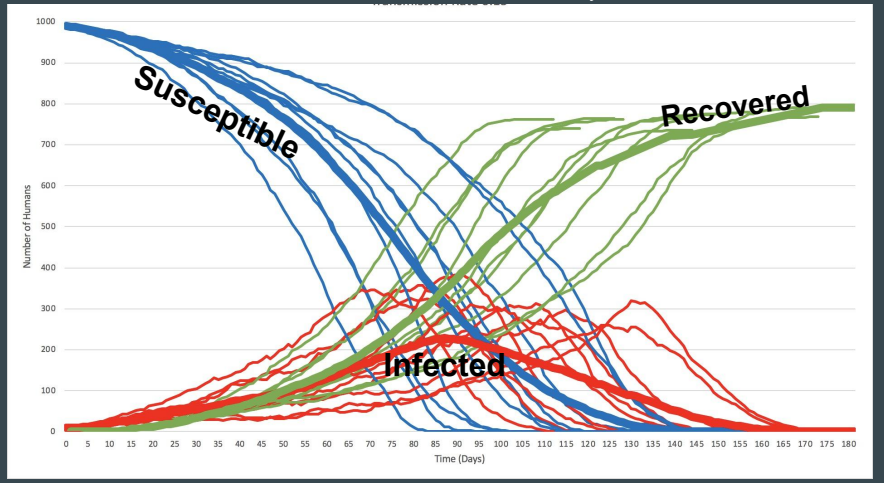
Pearson Correlation Coefficient for Transmission Probability and R0 (Basic Reproductive Number): $R=0.8905$, $R^2=0.793$, significant at $p<.01$

Transmission Probability SIR Model

Transmission Probability = 0.13



Transmission Probability= 0.15



Pearson Correlation Coefficient for Transmission Probability and R0 (Basic Reproductive Number): $R=0.8905$, $R^2=0.793$, significant at $p<.01$

Key Results

Mean Value	**Barriers to Healthcare** (0=no barriers to 1=complete barriers)	**Mobility** (0=stationary to 1=unrestricted)	**Infected Detection** (1, 5, 10, 20%)	**High-Touch Areas** (True/False)
Total Mortality	**~5-25%** R=0.6339	**~1-6%** R=0.3066	**~0.5-19%** R=-0.6288	**~5-23%** r=0.8725
Infected Mortality	**~14-26%** R=0.6376	**~9-14%** R=0.2959	**~11-21%** R=-0.5505	**~14-24%** r=0.7923
Symptomatic Mortality	**~23-43%** R=0.6518	**~15-23%** R=0.2906	**~16-34%** R=-0.5898	**~23-40%** r=0.8019
R0	**~1.33-4.10** R=0.6254	**~0.88-1.42** R=0.2705*	**~0.74-5.28** R=-0.606	**~1.33-4.26** r=0.8397

*not statistically significant at $p<.05$

Conclusions

- Challenges faced by farmworker communities may have impact on mortality and spread of virus — further inquiry and adequate protections needed
- Future models could incorporate real-world data, potentially using GIS to model a specific farmworker community