The Center for Leadership Simulation and Gaming

NASPAA Simulation Workshop
October 17, 2019

UNIVERSITY of VIRGINIA | FRANK BATTEN SCHOOL of LEADERSHIP and PUBLIC POLICY

Agenda

- Introduction
- Pandemic Game
- Host Nations

CLSG members here today

Andy Ortiz, MD

Senior Engineer

Adam Roux

Coordinator & Writer

Steven Parrott

Full Stack Developer

Mission

- We design, develop, and implement cutting edge simulations and experiments to advance education and research in leadership & public policy, and to create a community of scholarship in our methodology.
- Our Philosophy: “Tell me and I forget, teach me and I may remember, involve me and I learn”
  - Immersive, experiential learning tools: bridge the gap between the structured textbook learning to dynamic real-world problems

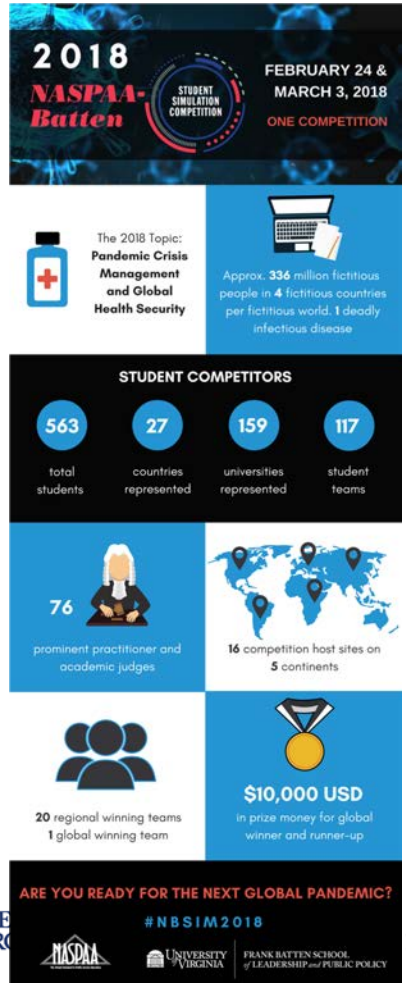
3 Characteristics

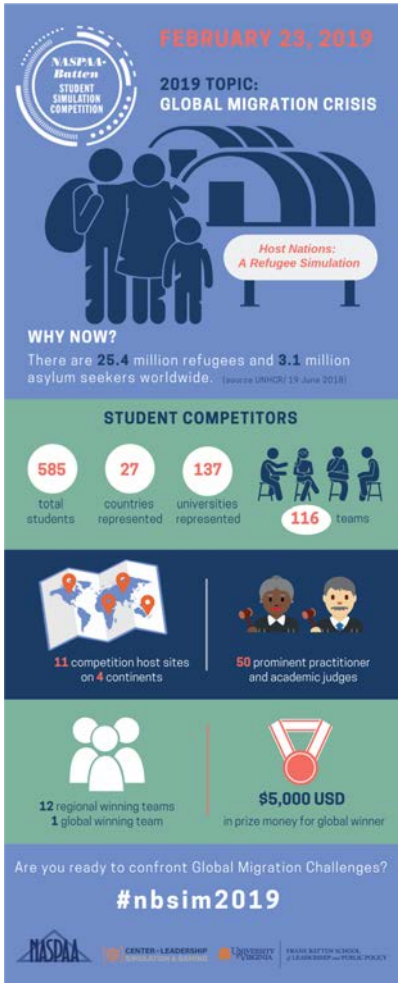
- Public Policy Focus
  - Learn about potential outcomes in policy settings
  - Economics, Political Science, Behavioral Science, etc
- Participatory Nature
  - Human element (roles)
    - Education in leadership
- Computer-based
  - Can be complex
    - Computationally and conditional
  - Scale
  - Flexibility

Participatory Simulations in Public Policy

- Better understand the complex issues we present (pandemics, refugees, health care systems, etc)
- Practice thinking analytically in the public policy arena using the limited information and tools at hand
- Find consensus and work with others

NASPAA-Batten Student Simulation Competition





SIMULATION & GAMING

Pandemic Game

Global Health Security Simulation

Motivated by 100 year anniversary of the Spanish Flu

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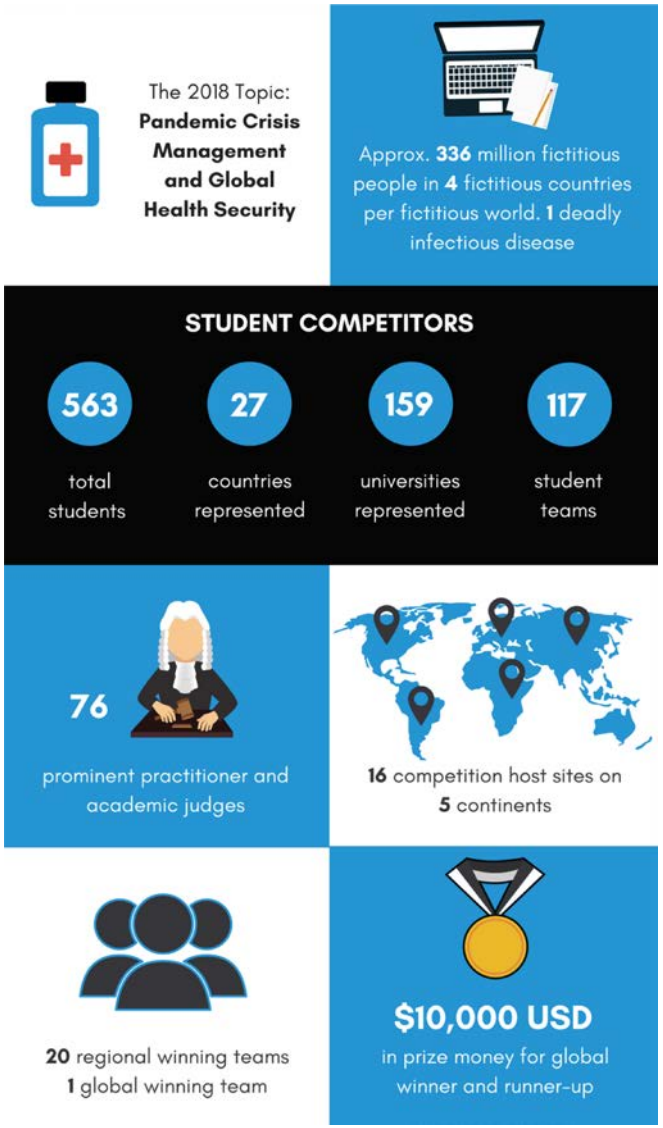
Pandemic Simulation

- This is an interactive, stochastic, and continuous game where you are challenged to –
  - Make difficult public policy decisions in a fast paced environment with limited information
    - Your decisions impacts lives, politics, and the economy
  - Work effectively in a team environment
  - Interact with other teams; it is a GLOBAL pandemic
- You will be
  - Developing strategies to preserve **global health**
  - Making choices to fight against the **pandemic**
  - Considering **political** and **economic** impacts

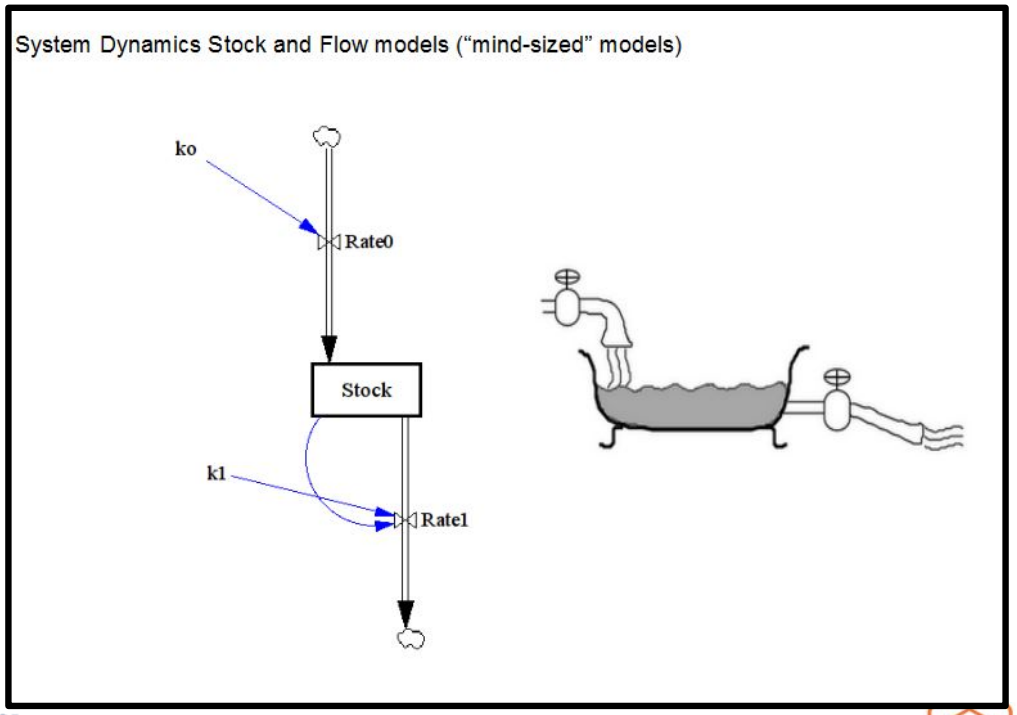


Game Scenario

- Team consist of 3 to 5 players
  - Teams are assigned to a single country
  - Assigned following roles:
    - Prime Minister
    - Minister of Public Health
    - Minister of Finance
    - Minister of Communication
    - WHO Representative
- Each world consists of 4 countries
  - Countries within a world impact and interact with one another.
- These countries are based on real countries

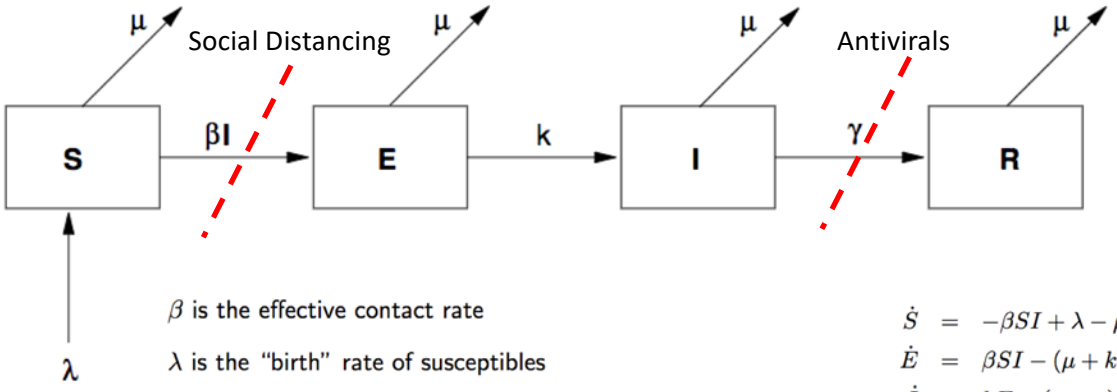
System Dynamics

- Method used to understand complex systems using stocks, flows, feedback loops



http://www.resilience.org/stories/2013-09-27/mineral-resources-and-the-limits-to-growth/

S-E-I-R Model
Susceptible-Exposed-Infectious-Recovered/Removed



β is the effective contact rate

λ is the "birth" rate of susceptibles

μ is the mortality rate

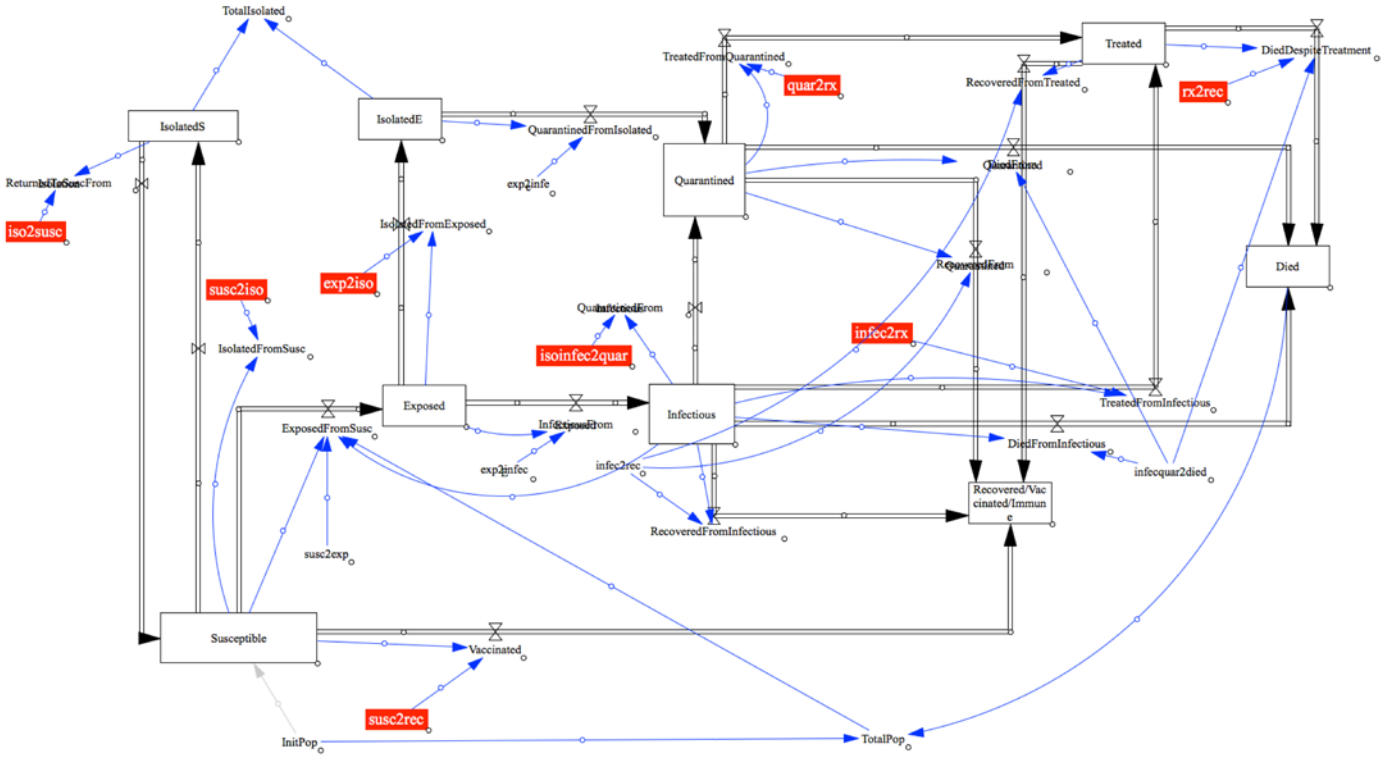
k is the progression rate from exposed (latent) to infected

γ is the removal rate

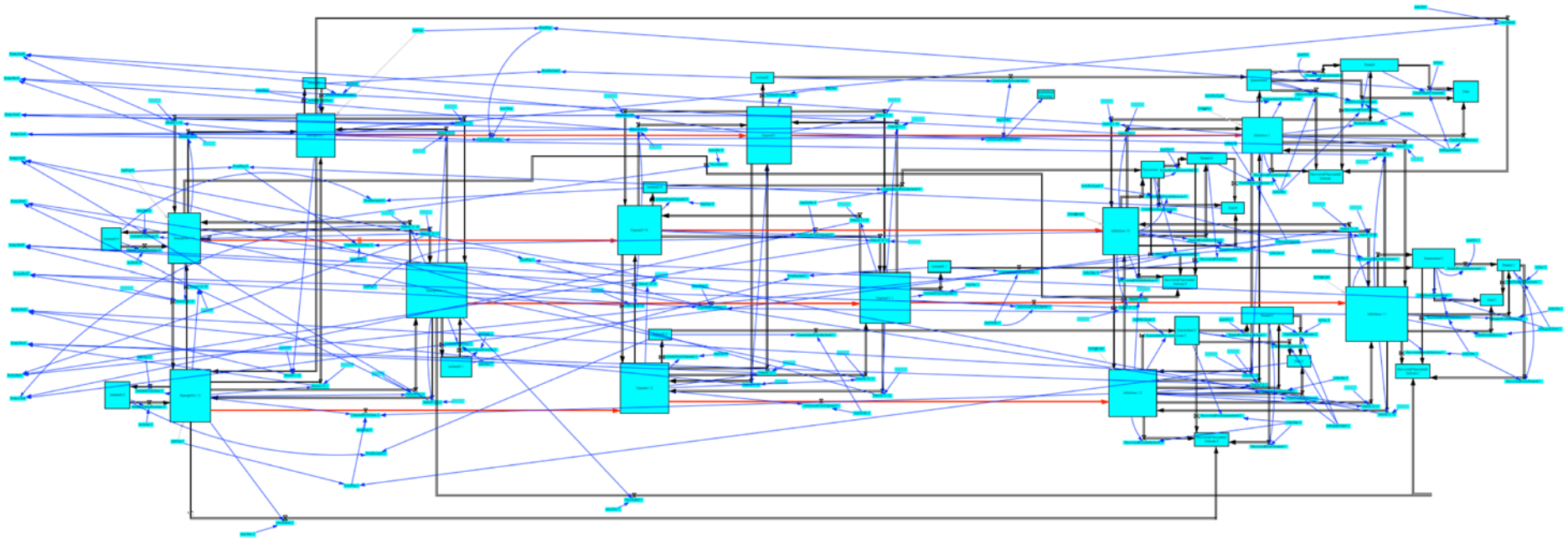
$$\begin{aligned}
\dot{S} &= -\beta SI + \lambda - \mu S \\
\dot{E} &= \beta SI - (\mu + k)E \\
\dot{I} &= kE - (\gamma + \mu)I \\
\dot{R} &= \gamma I - \mu R
\end{aligned}$$

James Holland Jones. (2008, May 3). Models of Infectious Disease. Dept of Anthropology, Stanford University. Retrieved from https://web.stanford.edu/~jhj1/teachingdocs/Jones-Epidemics050308.pdf

Our simulation (country level)

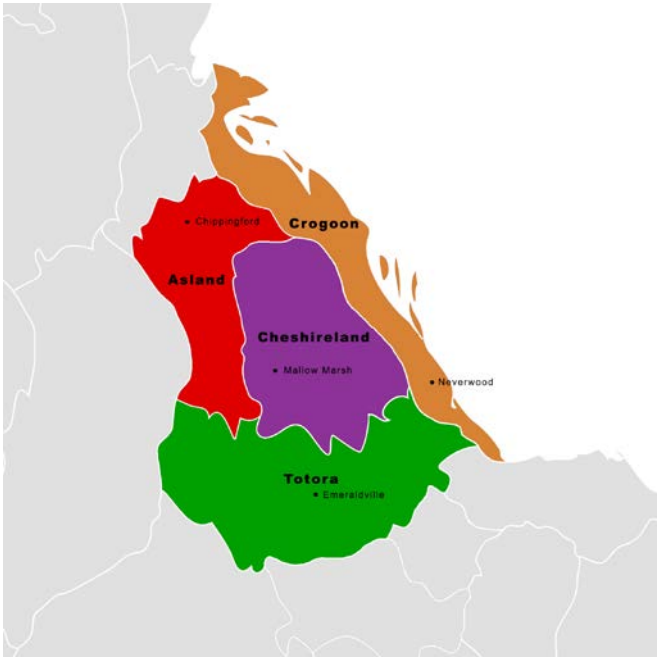


Our simulation (world level)



Based on Real Countries

- Asland
  - Based on Chile
- Crogoon
  - Based on Seychelles
- Cheshireland
  - Based on Guangdong, China and Hong Kong
- Totora
  - Based on NE India: Uttar Pradesh, Bihar, Jharkhand, and West Bengal



Data used to build countries

- Population and culture
- Media Exposure and usage
- Employment rate
- Number of households
- Population distribution
- 2011 GDP by Sector
- Transportation usage, passenger versus cargo
- Exports and imports

Most data was collected from census records, statistical sites, and surveys.

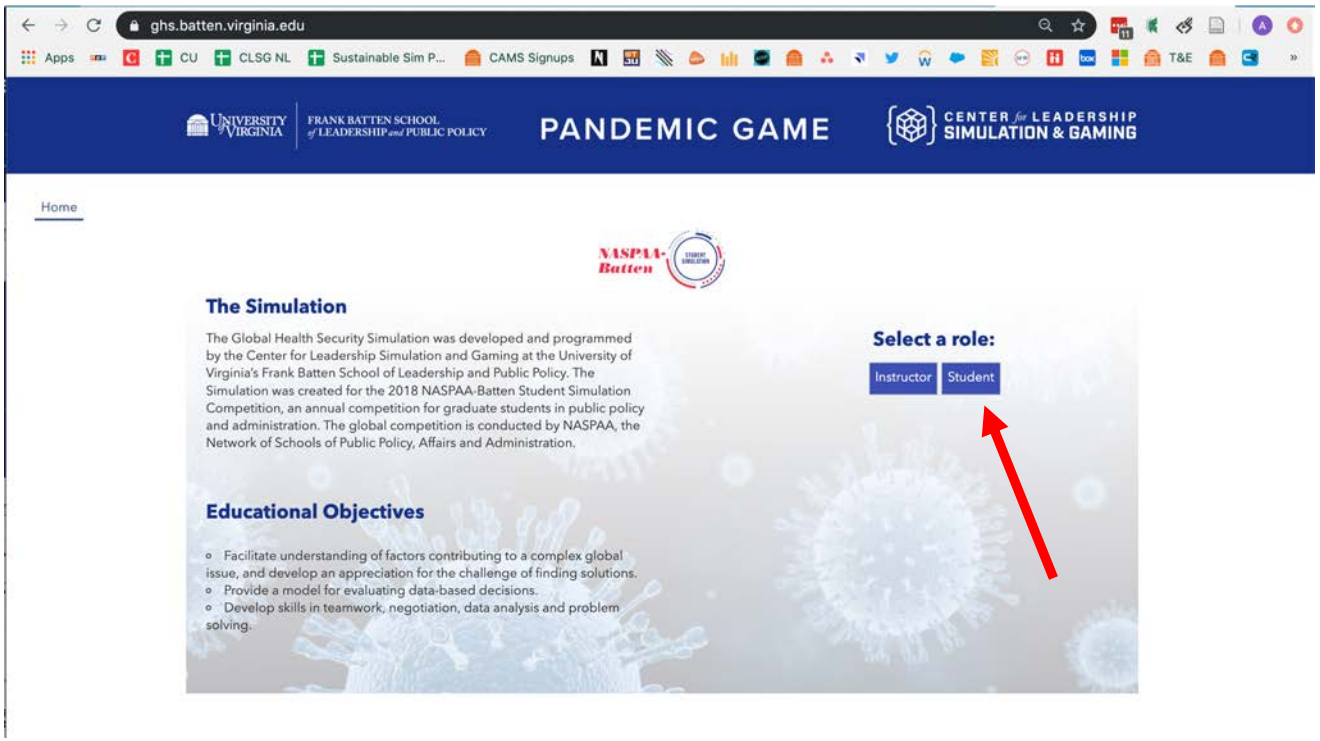
Data was used to gauge policy impact variance between countries.

The Pandemic Game

ghs.batten.virginia.edu

Sign in as student

Don’t need to enter a real email (a@b.com is fine)



The Pandemic Game: Interface Walkthrough

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Educational Objectives

- **Cooperation and Consensus Building**: issues like pandemics are global and cannot be solved by a single country; teams with conflicting interests must cooperate to resolve the situation
- **Crisis Management**: participants must make learn to make effective decisions while the clock ticks down
- **Solving Complex Problems**: simple solutions or simplistic thinking cannot capture the complex of a policy issue
- **Critical Analysis of Data**: participants are required to make decisions with limited information
- **Public Health Policy**: give participants a sense of the concerns and what tools are available
- **Interdisciplinary Approach**: public policy and science should compliment one another

Simulation Structure

- 175 days in 30 minutes
- Instructor can determine death rate and country of origin (replayability)
- Inter-team communication via chat feature
- Negotiations and cooperation necessary to resolve the crisis without damaging economy

Policies

- Based off of policies that were enacted or proposed in past epidemics and in preparedness reports
- Impacts based on data collected in scientific studies, surveys, and reports
- Policies don't always do what you'd expect
  - Closing schools
    - Can backfire, harm economy
  - Quarantine
    - Expensive and not very effective
  - Vaccines
    - Seasonal vaccines don't protect against new strains
    - Not all vaccines develop effectively
  - Gloves, masks, and hand sanitizer
    - The flu virus can live 100x longer on gloves than on skin
    - Viruses are small enough to go through most masks
    - Distributing hand sanitizer can cause a condition of Risk Compensation

Check your countries!

Instructor:

World Name: **Pandemic**

Default Death Rate: **2 %**

Played on: **Fri Oct 11 2019 15:14:26 GMT-0400 (Eastern Daylight Time)**

Number of participants: **0**

Country	Game Death Rate	Budget Left (%)	Economic Health (%)	Approval (%)	Global Health Fund Contribution	Global Health Fund Share	Score vs Previous Players	Score vs AI	Peer Score
Asland	1.981	100.00	64.41	10.00	0	500,000	3.51	0.77	0.00
Cheshireland	2.013	100.00	62.63	49.30	0	500,000	37.17	90.87	0.00
Crogoon	2.039	100.00	57.87	10.00	0	500,000	2.00	0.11	0.00
Totora	1.990	100.00	66.12	10.00	0	500,000	11.41	1.28	0.00

Print Page

Host Nations

A Refugee Simulation

Motivated by pressing global issue of forced migration

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Simulation Structure: Welcome to Altrippa

- Migrants fleeing failed state move north
- Round-based for adaptable time frame
- Iterative, replayable
- Multiple time frames
- Four playable countries: Ottania, Durrit, Capalla, Urmm
- Each team has five roles: Prime Minister, ATG Delegate, Home Office Secretary, Minister of Labor, Minister of Health & Human Services
- Regional body to emphasize negotiations between team:
  - ATG (Altrippa Treaty Group)
- Worlds that find a regional solution to the crisis do better than worlds where teams go it alone

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Where did we get our data?

The game was built using data from the 2015/16 EU Refugee Influx

Specifically, we looked at four countries:

Urmm was built using data from Turkey

Capalla was built using data from Austria

Durrit was built using data from Hungary

Ottania was built using data from Germany

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Where did we get our data?

eurostat

UNHCR
The UN Refugee Agency

THE WORLD BANK

Pew Research Center

aida
Asylum Information Database

OECD
BETTER POLICIES FOR BETTER LIVES

Federal Office for Migration and Refugees

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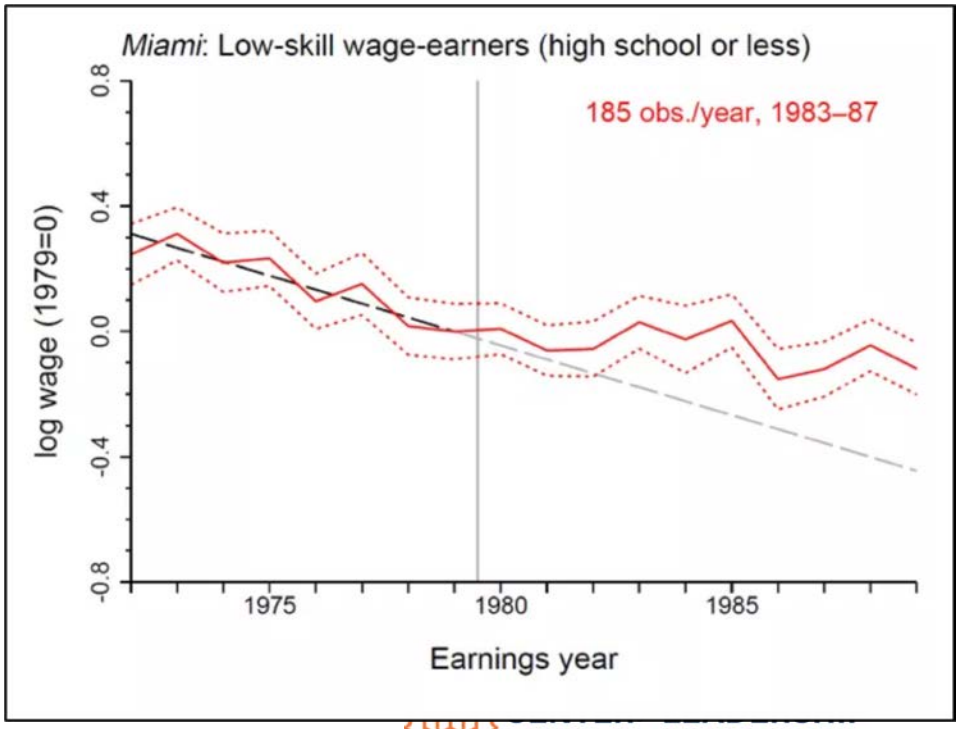
Card, David (1990). "*The Impact of the Mariel Boatlift on the Miami Labor Market.*"

- Apr - Oct 1980: 125,000 Cuban Refugees entered Miami, Florida

Findings:

Overall workforce earnings 8% higher vs. national rate

Low-wage earnings 20% higher vs. national



DIW Berlin

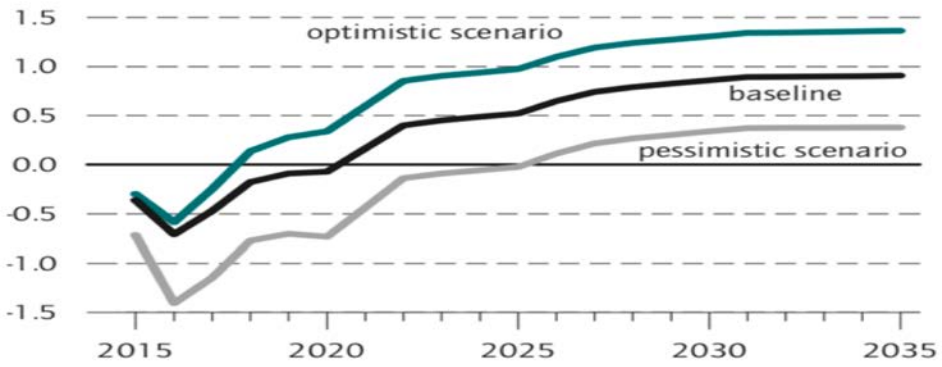
Integrating refugees: A long-term, worthwhile investment (November 2015)

"Much evidence that unemployment is initially very high among recognized refugees, probably because many refugees do not immediately have the required qualifications, **starting with language skills**. The longer the refugees remain in Germany, however, it can be assumed that these obstacles will be gradually overcome, and thus the unemployment rate will slowly decrease over time"

Figure 1

Benefits from sucessful integration net of costs[1]

In percent of GDP

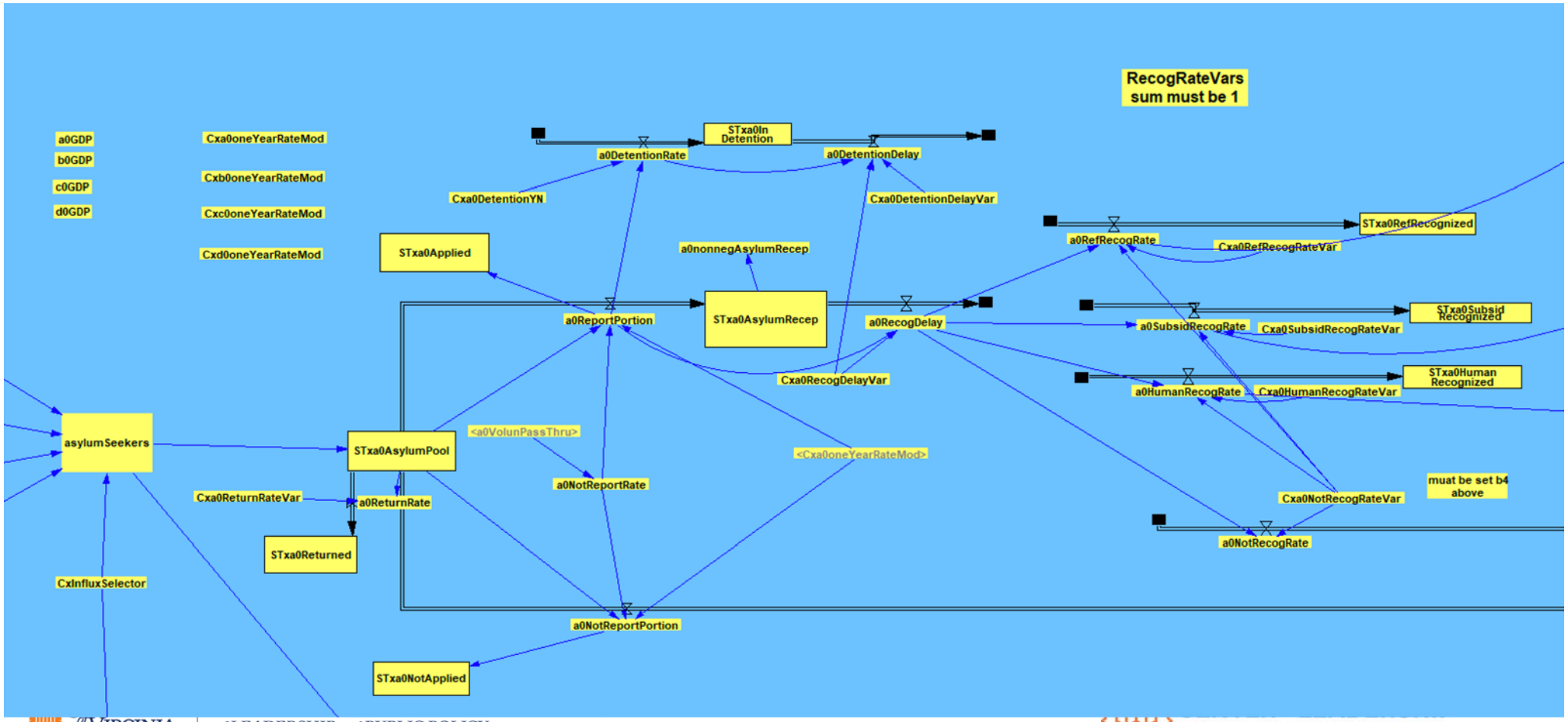


1 Production increase due to additional demand and refugees' labor supply net of cost for care, accommodation, and integration of the newly arriving refugees as well social transfers for non-employed refugees.

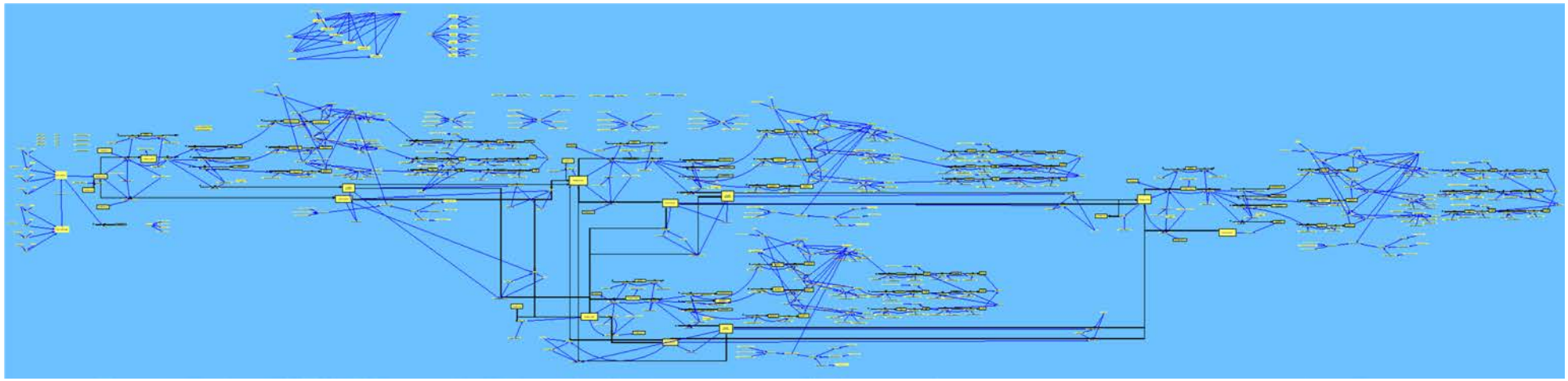
Source: Own calculations.

After several years positive effects dominate the costs.

Simulation Model (Country Level)



The Simulation Model (World Level)



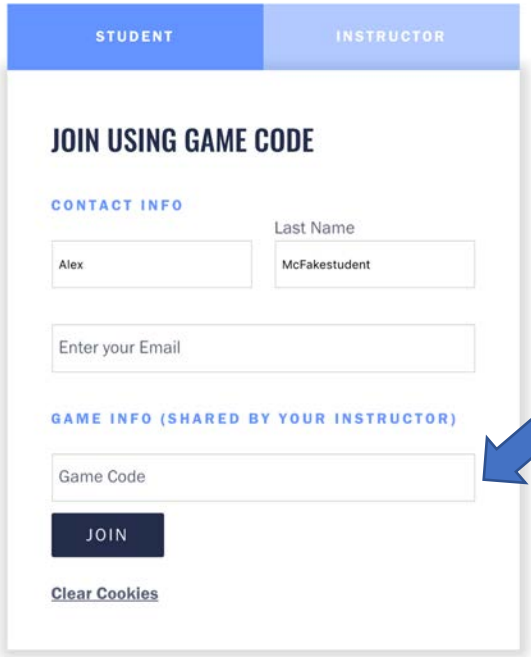
Educational Objectives

Leadership, Critical Thinking, Consensus Building

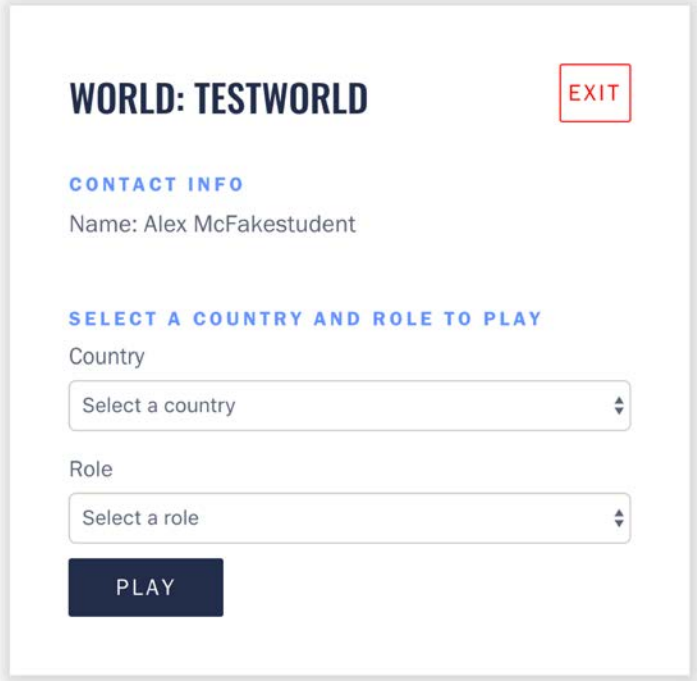
- **Working in a team** environment with multiple teams
- Strategic Thinking: Defining and achieving a common goal
- Interactions with other countries: partnering and political savvy
- **Different conditions**: countries can contribute in different ways
- Within own team: leveraging diversity, conflict/crisis management, decisiveness and negotiating
- Learn potential policy outcomes in a **risk-free environment**
- Complexity and Shortcomings of Asylum & Refugee Policy
- **Trade-offs**: human rights and budget restrictions
- **Long-term benefits** outweigh short-term costs; weathering short-terms costs & downturns
- **Integration**: skills training, language training, housing, permission to work, freedom of movement

Login

http://hostnations.batten.virginia.edu



Please use Google Chrome only



Host Nations:
Interface Walkthrough

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European Commission

European Economic Forecasts - Autumn 2015

“If managed properly, the inflow of refugees will have a small favourable effect on growth in the short and medium term. This will crucially depend on policies to integrate accepted refugees in the labour market.”

www.clsgbatten.org