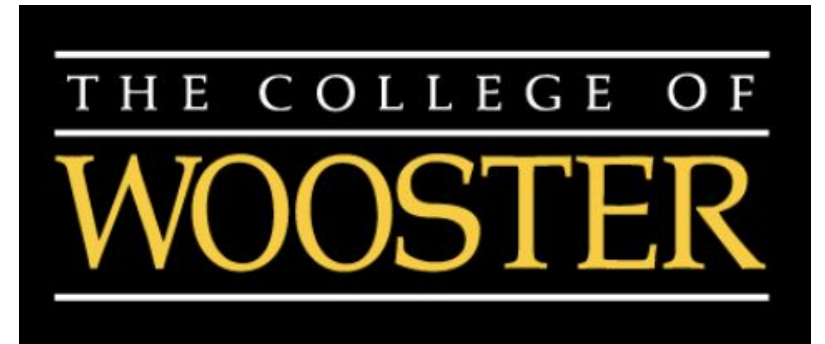


# The System Dynamics of Medicaid Enrollment: A New Approach to Inform Policy

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# Problem

- Some portion of vulnerable Americans who are eligible for Medicaid are not enrolled in Medicaid.
  - Coverage and continuity of care considerations
  - State program costs, planning, budgeting, and contract arrangements
- Despite continued efforts, errors of classification persist.
  - About 1/3 of adults *miss taking up* coverage nationally
  - 55% of enrollees experience a change in their status over 2 years (*churn*)

# Problem

- Outcomes of interest:

- Caseloads (number of enrollees)
- Participation among the eligible (***missed take-up***)
- ***Churning*** off and on the program
- “Fraud”; “undeserving” beneficiaries

*Classification errors*

PROGRAM ENROLLMENT OUTCOMES, at $t$		Enrolled	
		Yes	No
Eligible	Yes	<i>Take-up</i>	<i>Miss</i>
	No	<i>Improper enrollment</i>	<i>Other</i>
<i>Churn</i> is movement among these categories over time			

# Research Questions

- How do we capture these *compound* phenomena/dynamics over time?
- How do people move through the enrollment system?
- How do we model the likely effects of programmatic and situational changes? (trade-offs, interactions, emergent properties)

# Analytical Method: System Dynamics Simulation

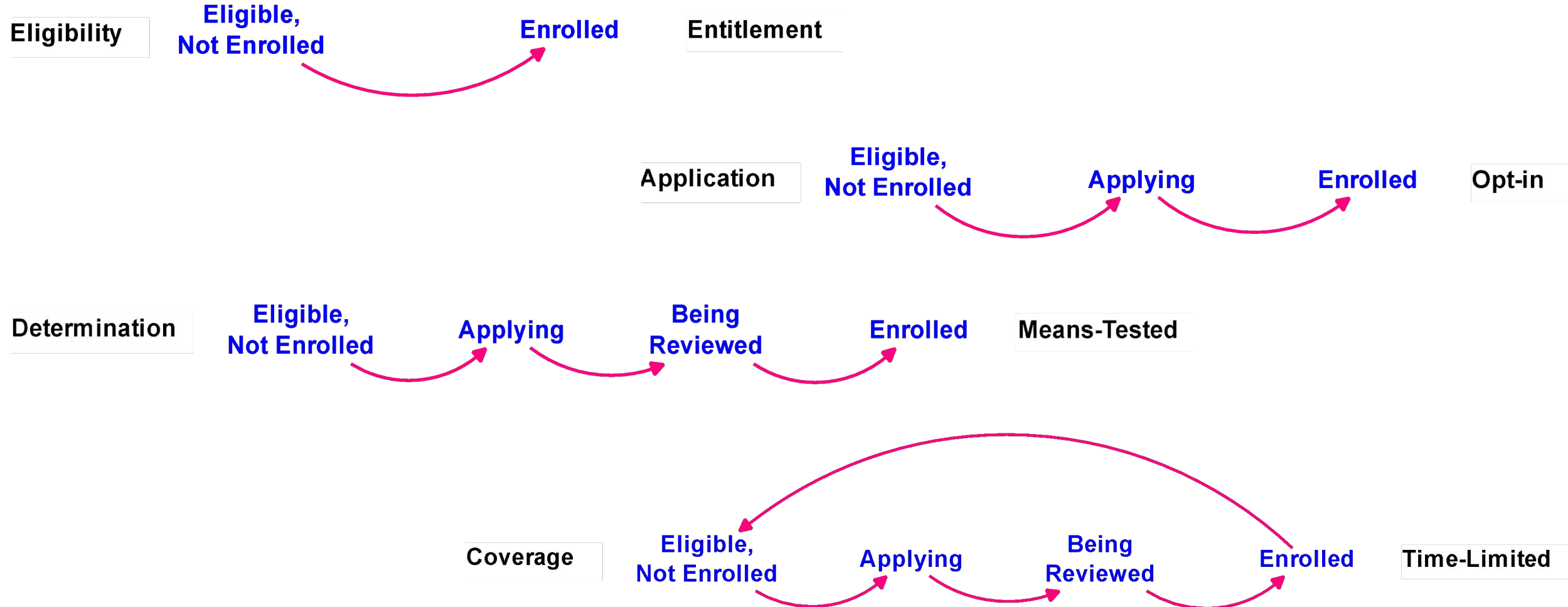
- Computer-aided approach
- Suited for dynamic problems
  - Interdependence
  - Feedback
  - Delays
- Endogenous view of phenomena
  - Stocks, flows, feedback structure

*What do the characteristic processes of the system look like?*

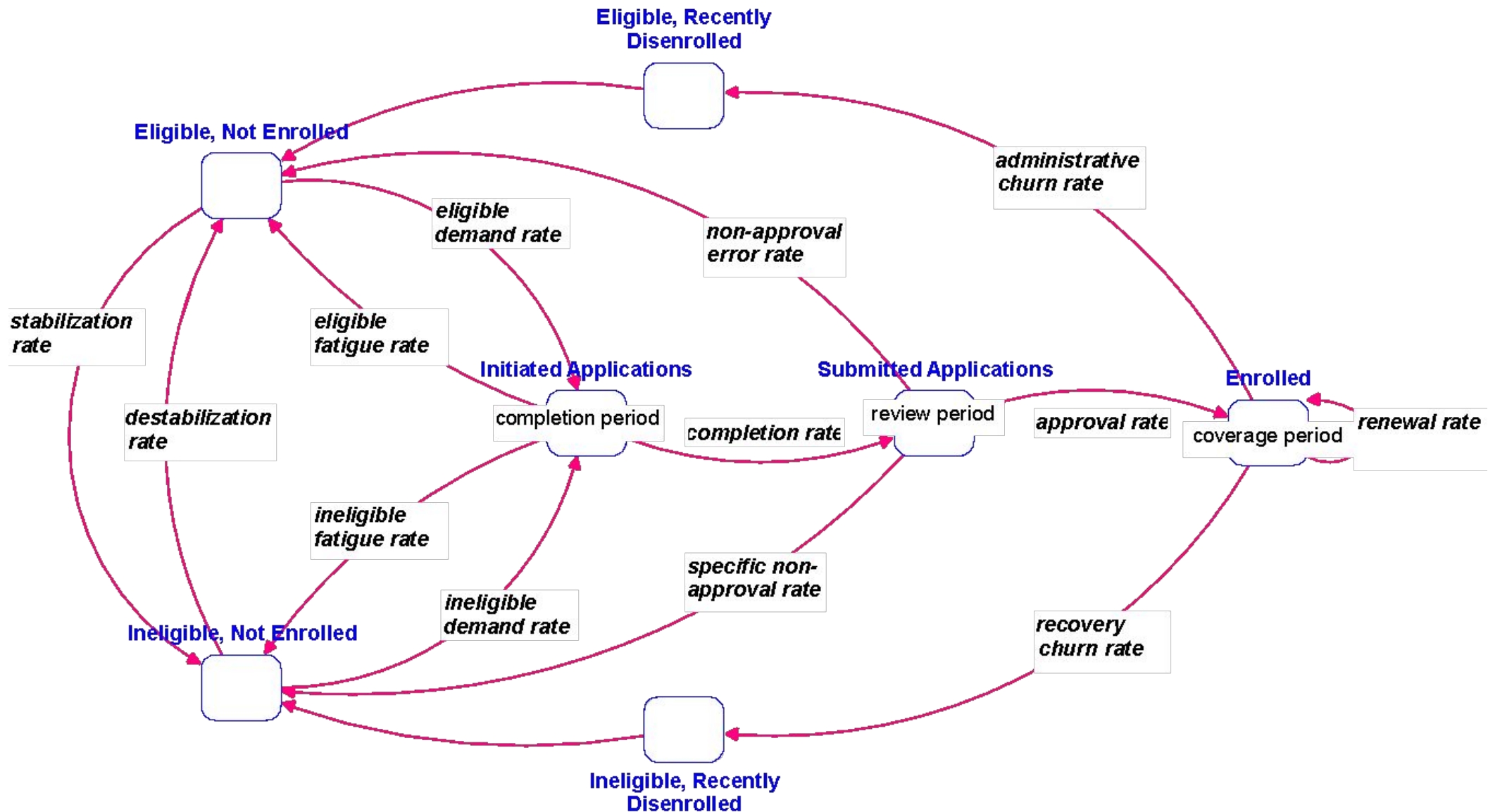
*Where can people accumulate?  
In what ways can they move?*

- System of coupled, nonlinear, differential equations
- Simulates system behavior in discrete time steps
- Uses multiple types and sources of data on unit and system levels

# How do people move through the system?



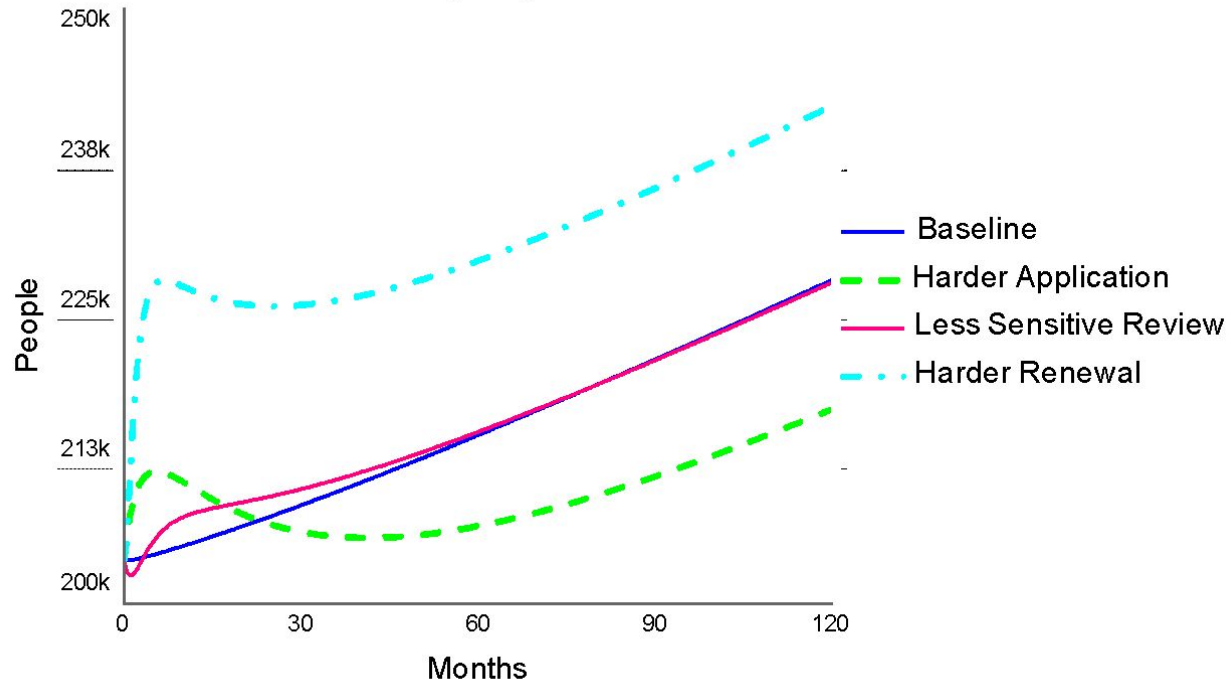
# Model of Stock and Flow structure



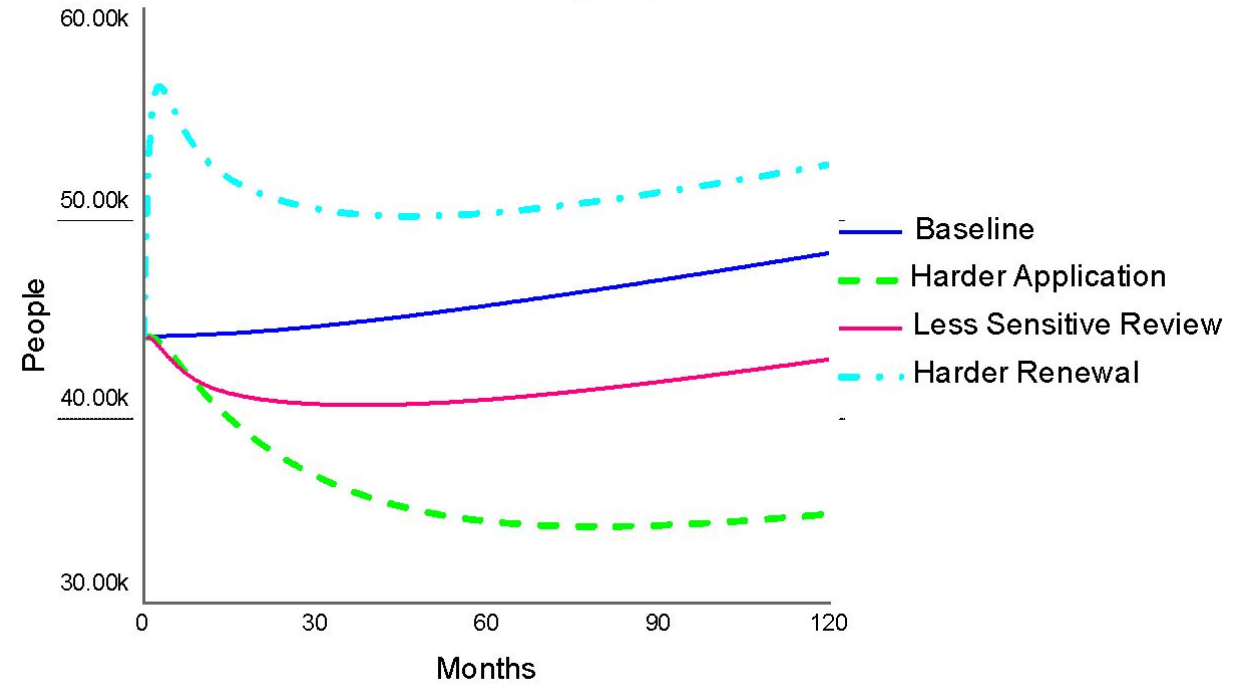
Data	Process Phase	Stock, Flow, Delay Variables	Start Values	Data Source
	Eligibility (Entitlement)	Eligible, unenrolled population Ineligible, unenrolled population	160,133 7,602,266	Kaiser estimates of CPS, Annual Social and Economic Supplements 2017
Model Initialization		<i>Income stabilization</i> <i>Income destabilization</i>	2.5% 3.25%	Shore-Sheppard 2014
		<i>Population growth rate</i> <i>Population loss rate</i>	0.5% 0.4%	UC Census Bureau 2016 State Files
	Application (Opt-In)	People with initiated applications	368,937	Calibrated value (Ohio 2016)
		<i>Application demand rates (Eligible, Ineligible)</i> <i>Application fatigue rates (Eligible, Ineligible)</i> <i>Completion (net application) rate</i>	85%, 1% 15%, 30% 70%	Modeler assumptions
		Average completion period	2 months	Modeler assumption
	Determination (Means Test)	People with submitted applications	339,818	Calibrated value (Ohio 2016)
		<i>Coverage approval rate</i> <i>Coverage non-approval rates (error, specific)</i>	75% 5%, 15%	Modeler assumptions
		Average review period	2.5 months	Federal guidelines (US Code XIX 1396a8)
	Coverage (Time-Limited)	Enrolled population	2,896,200	Ohio Department of Medicaid enrollment files
		Recently disenrolled, eligible Recently disenrolled, ineligible	43,434 57,912	Calibrated values (Ohio 2016)
		<i>Coverage renewal rate</i> <i>Churn rates (administrative, recovery)</i>	50% 25%, 20%	Kaiser Commission on Medicaid & Uninsured 2017 Ku & Steinmetz 2013; Shore-Sheppard 2014
		Average coverage period	10 months	Ohio average, Department of Medicaid 2016



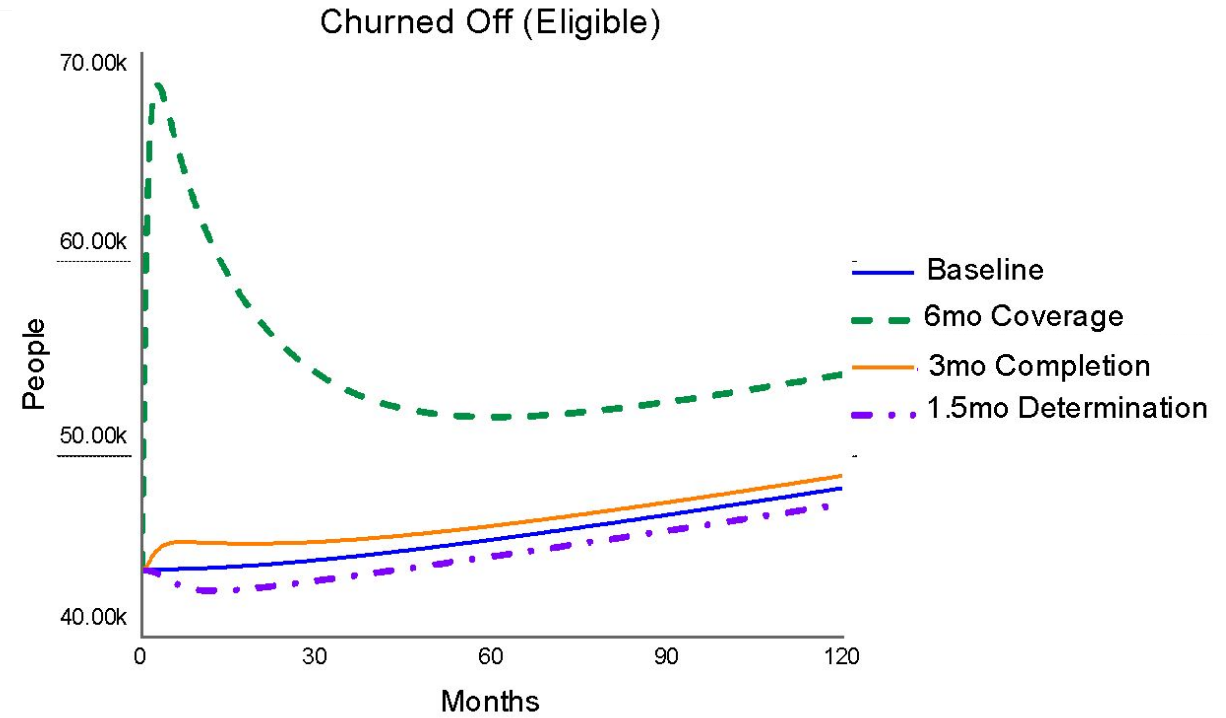
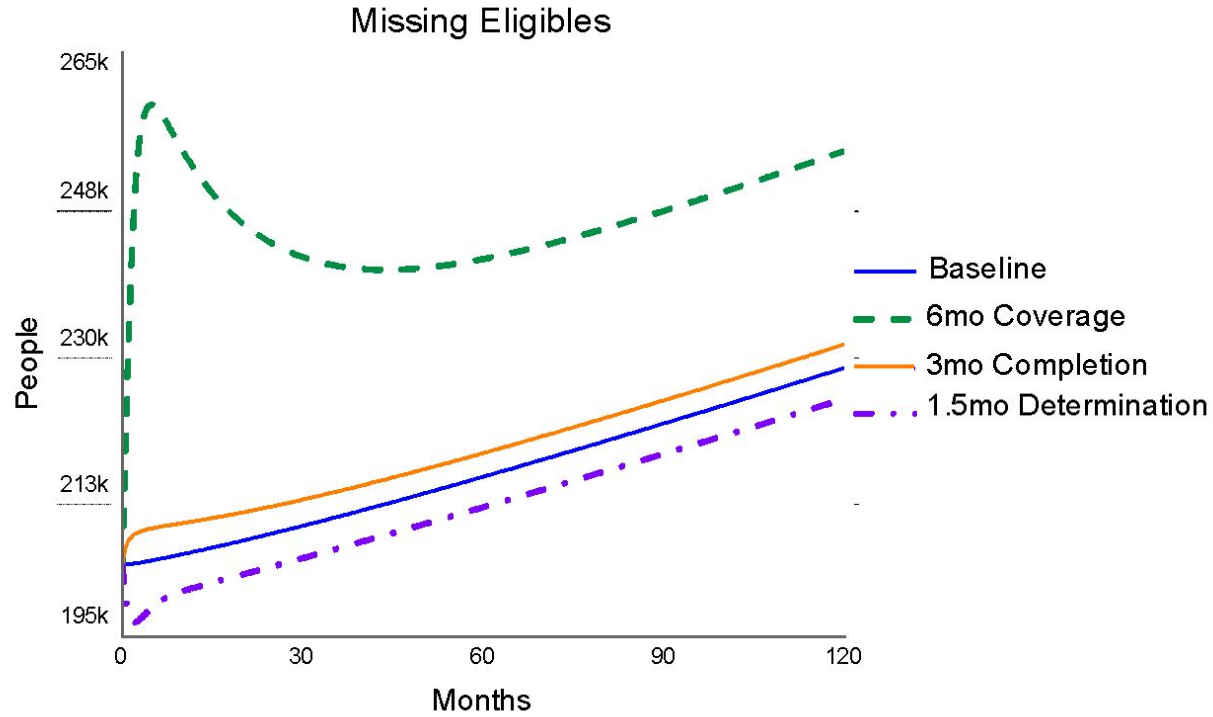
Missing Eligibles



Churned Off (Eligible)



*Effects of changes in flow rates*



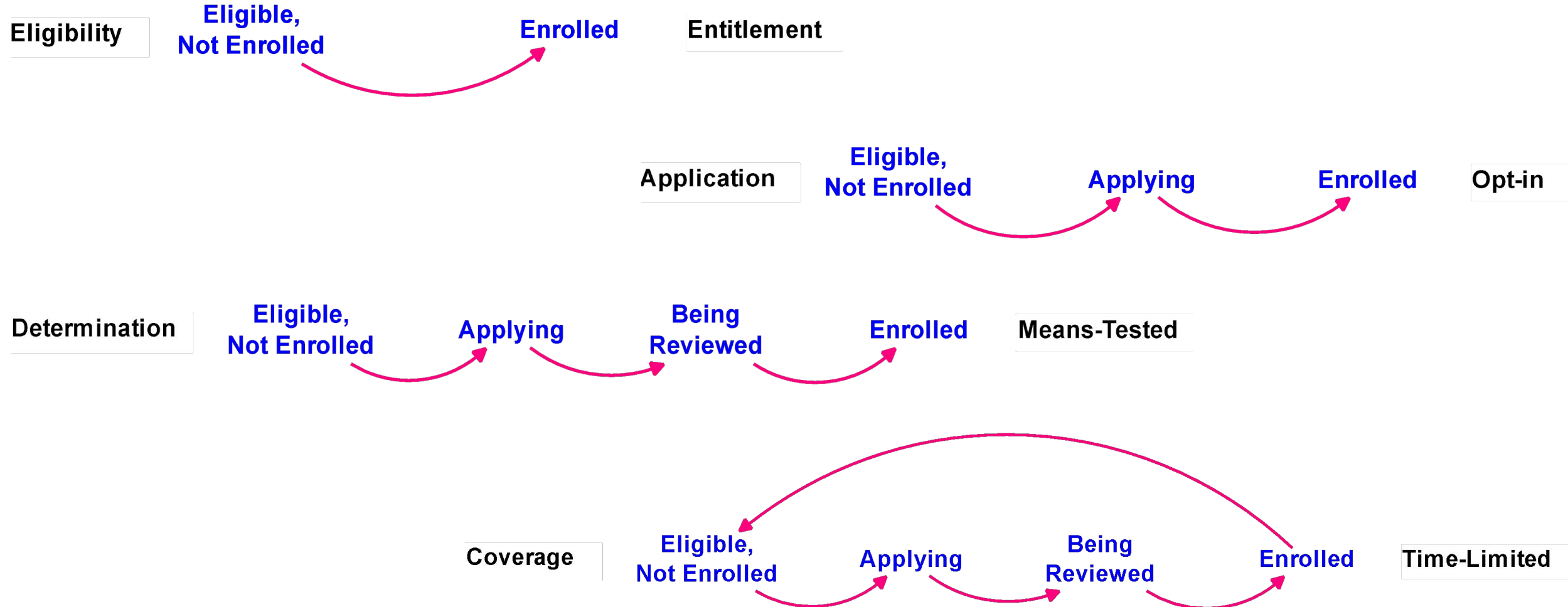
*Effects of changes in delay periods*

# Findings

- How do we capture these *compound* phenomena/dynamics over time?
  - Program enrollment dynamics arise from structure of the system (it's a feature, not a bug)
  - Observed patterns of classification errors are endogenous patterns/policy resistance; churn (and other errors) is *endemic*

# How do people move through the system? →

## *Program Rules Create Feedback Structure*



# Findings

- How do we model the likely effects of programmatic and situational changes? (trade-offs, interactions, emergent properties)
  - Changes in eligibility rules and administrative procedures affect enrollment dynamics
  - “Administrative burden” is burdensome for all

# Future Directions -- We want your feedback!

1. A computational improvement to this SD model
  - a. Include transition probabilities
  - b. Turn constants into draws from distributions
  - c. Limit applications/month that can be approved to reflect admin capacity
  - d. Link approval and non-approval rates (sum to 1.0)
2. Differential effects of administrative burden
  - a. 3 versions of simulation for 3 populations: “safe”, “unstable”, “trapped”

# Future Directions -- We want your feedback!

3. Consequences of administrative burden
  - a. How much does churn cost the state?
  - b. Enrollment effects of change in lock-out period, coverage period, application completion period, etc.
  - c. Enrollment effects of change in error rates, approval/non-approval rates, reapplication rate, fatigue rates, etc.
  - d. “Shifting” administrative burden to the state (effects of change in delays and administrative burden on citizens versus the state; effects of changing structure through auto-enrollment; effects of changing administrative capacity)

# Future Directions -- We want your feedback!

## 4. Linking Simulation & Regression Models

- a. The problem of estimating exogenous parameters from limited data sources
- b. Effect (on demand, fatigue, net application rates, renewal, churn) of: outreach efforts, simplifying the application, forms of application verification
- c. How to best capture structure and consequences of work requirements?



# Future Directions -- We want your feedback!

1. A computational improvement to this SD model
2. Differential effects of administrative burden
3. Consequences of administrative burden
4. Linking Simulation & Regression Models

Finally:

- Who should we be talking to?
- What should we be reading (that we're not already)?

Contact Us!

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Thank you for your attention!

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