



Collaborative Modeling to Address Childhood Obesity

Karen J. Minyard, Ph.D.

*Division of Nutrition, Physical Activity and Obesity
Centers for Disease Control and Prevention
October 28, 2009*



ANDREW YOUNG SCHOOL
OF POLICY STUDIES



Legislative Health Policy Certificate Program

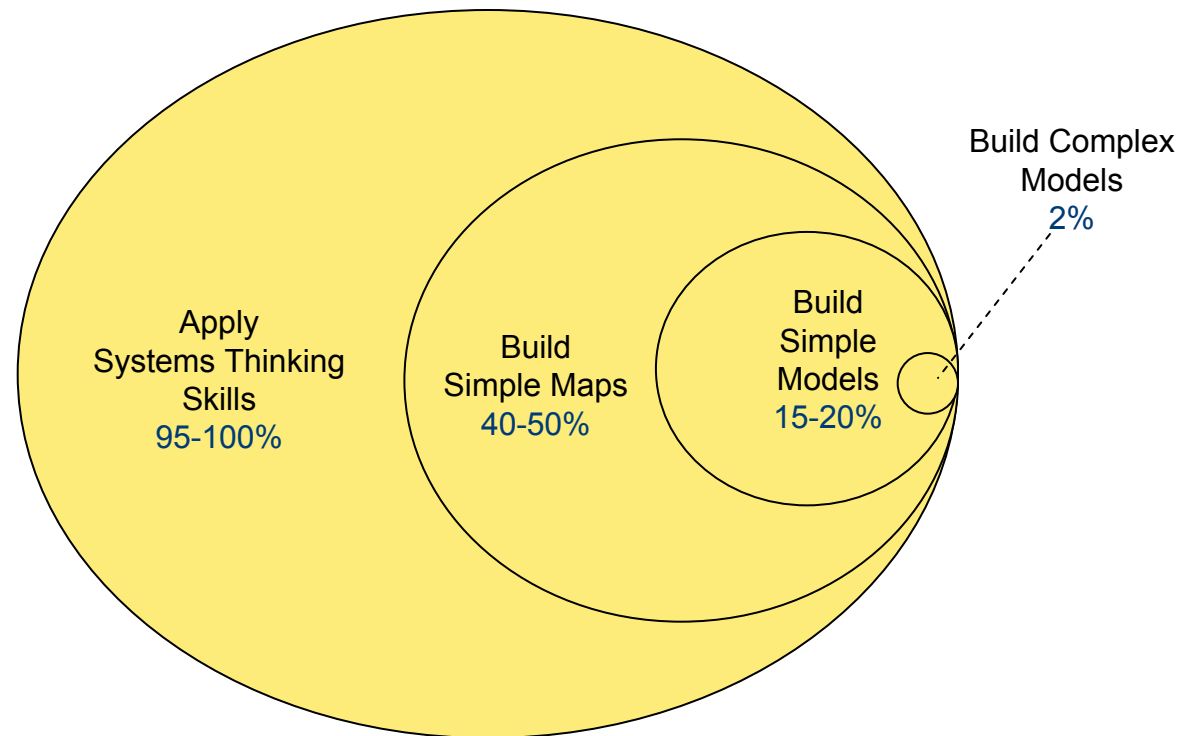
- Sponsored by the Georgia Health Policy Center
- Designed to prepare legislators and their staff to address challenging health issues
- Eight educational sessions over nine months
- Topics chosen based on priorities set by participants
- Those who complete a certain number of sessions receive Health Policy Certificate from Andrew Young School of Policy Studies

Legislative Health Policy Certificate Program

2008-2009 sessions include:

- Evaluating Health Policy: The Framework (May)
- The Impact of Health Status on the State (June)
- Financing Health Care: Challenges and Opportunities (August)
- Health Coverage and Access to Care (September)
- Financing Health Care: Provider Compensation (October)
- The Mental Health System (November)
- Interventions to Reduce Childhood Obesity (December)
- Addressing Georgia's Trauma Care Network (January)

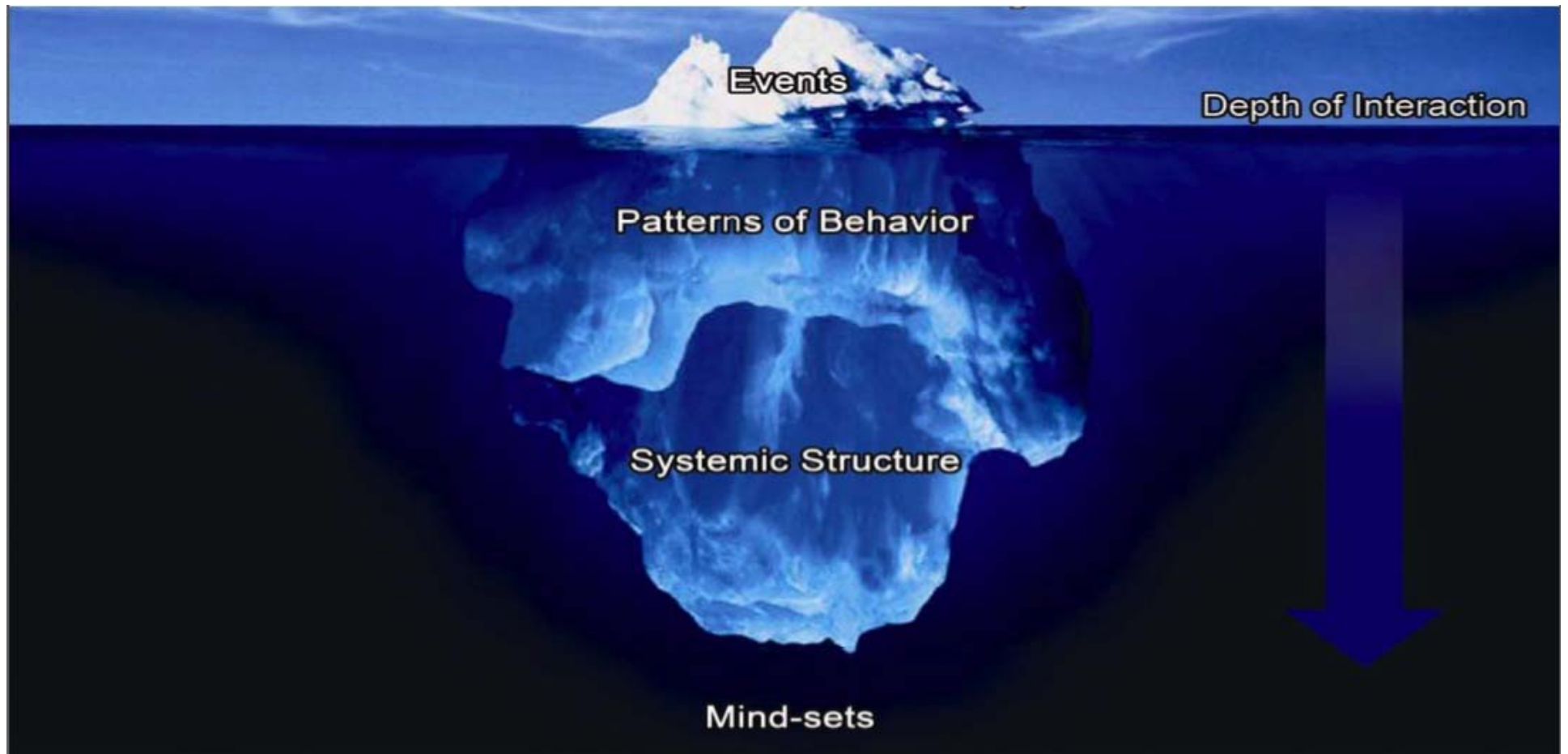
A Range of Systems Thinking Skill Sets



A Six-Question Framework for Evaluating Policy

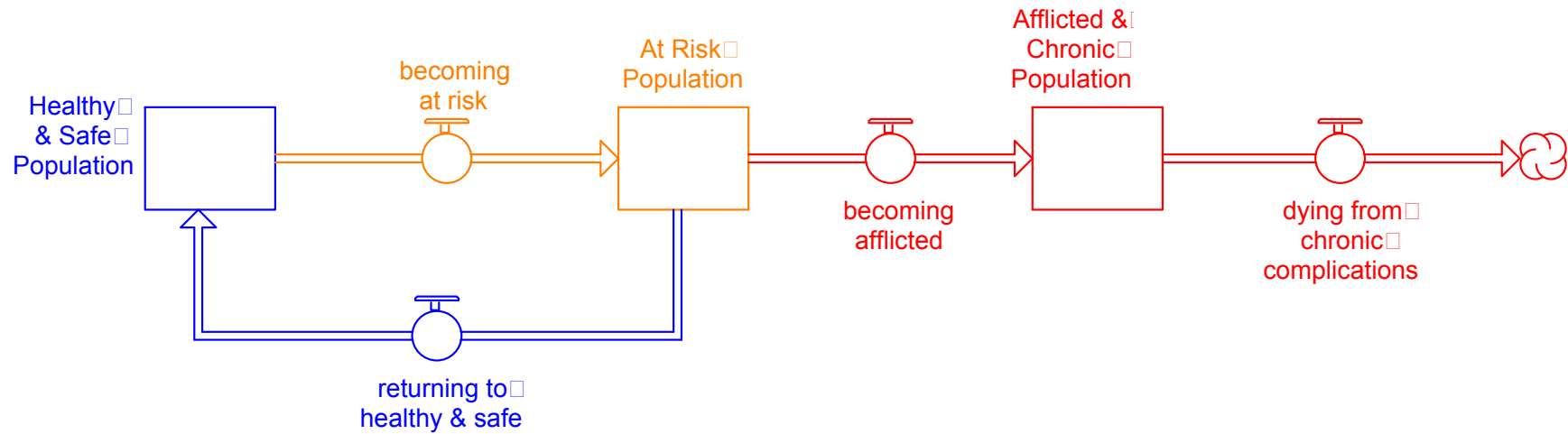
1. **What** is the important (perhaps troublesome) trend related to health in Georgia? *What* is the shape of this trend over the past several years?
2. **Who** are the stakeholders concerned about the trend?
3. **Why** this trend (what's the cause, what is responsible)?
4. **Where** is there *leverage* (some policy) to address the underlying cause of the trend?
5. **How** will it work? *How* will it play out *over time*? *How* might *unintended consequences* occur? *How* might the policy positively or negatively impact...
 - a) Health Status?
 - b) State Health Spending?
 - c) Health care system?
 - d) Health Equity?
6. **When** would the policy create an impact on health status? When would you see an improvement in some other indicators (i.e., spending, services)?

The Iceberg: A Metaphor for the Level at Which We Interact with a System



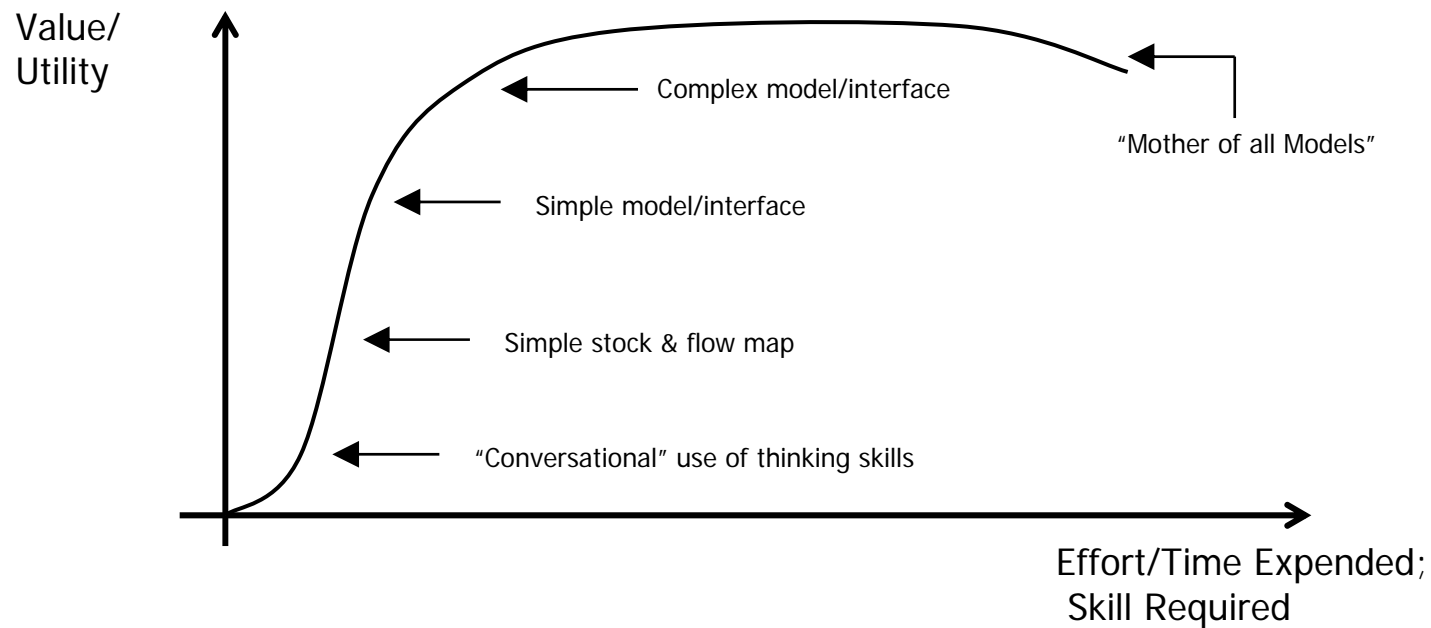
Source: Sustainability Institute, adapted from other versions from the organizational learning field

Stock and Flow Map



Applying Systems Thinking

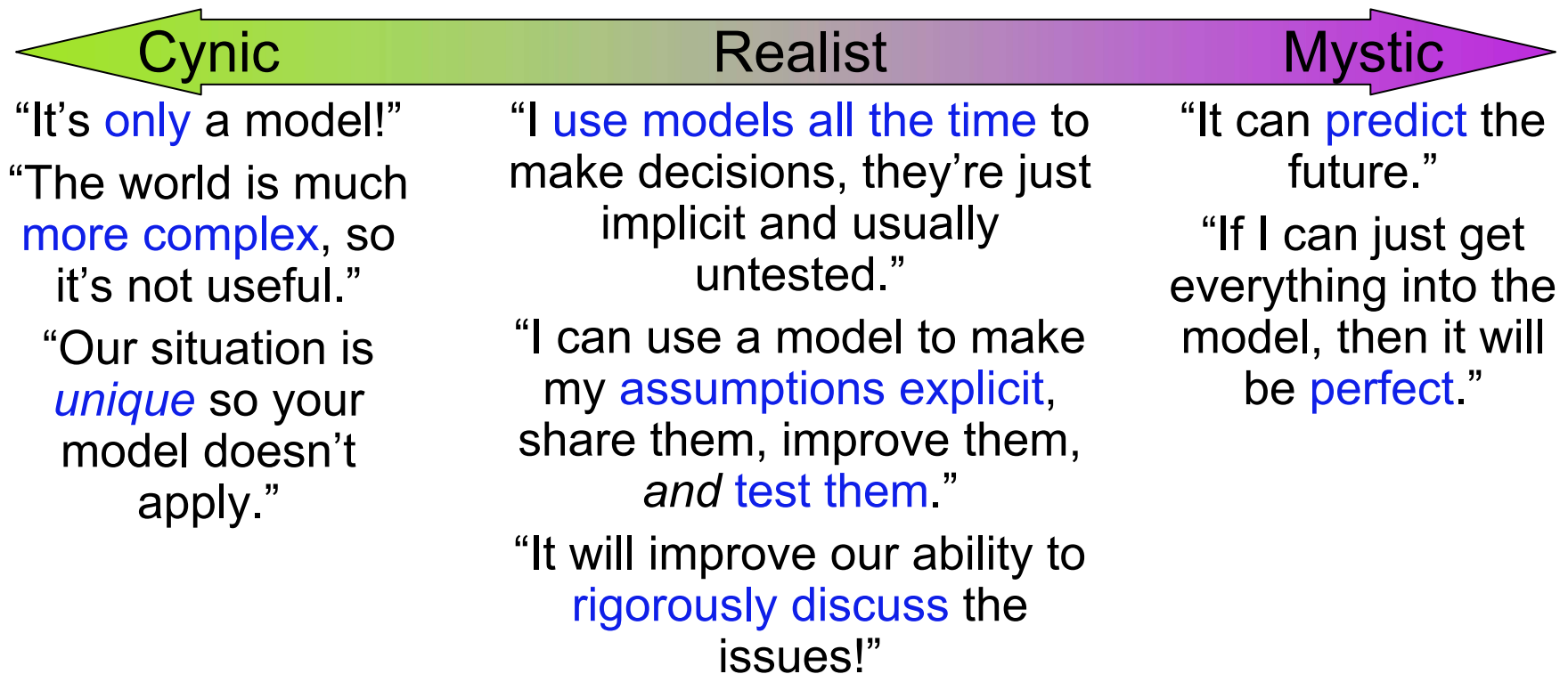
The following curve is instructive regarding how to apply system dynamics



There's value to be added at many points along the curve!

Perspectives on Models

Voices from the Cynic to Mystic



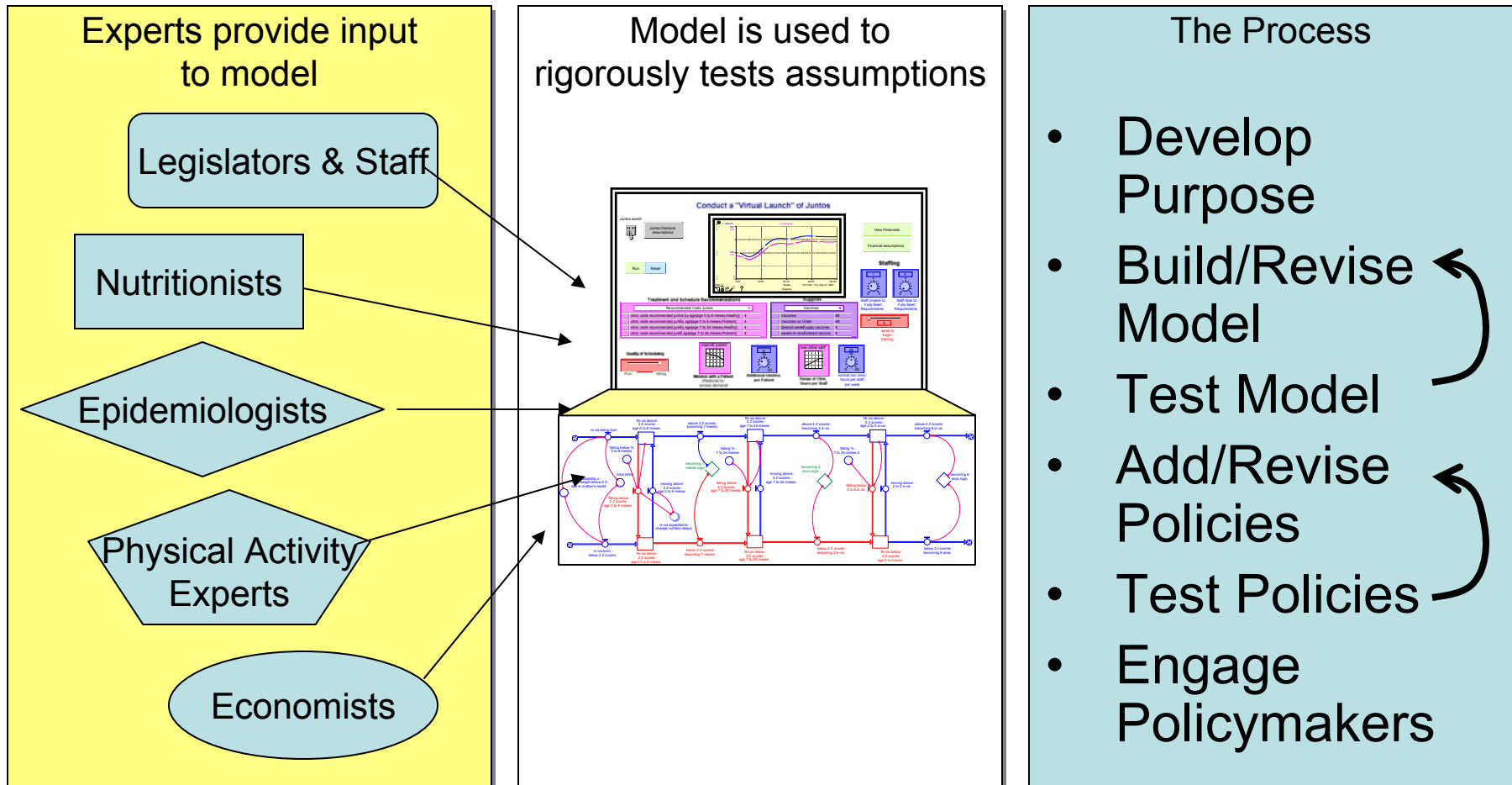
“All models are wrong, some are useful!”

-Box & Deming

Research Objective

- To apply systems thinking methods to broaden health policy discussions regarding causes of, and solutions to, childhood obesity.

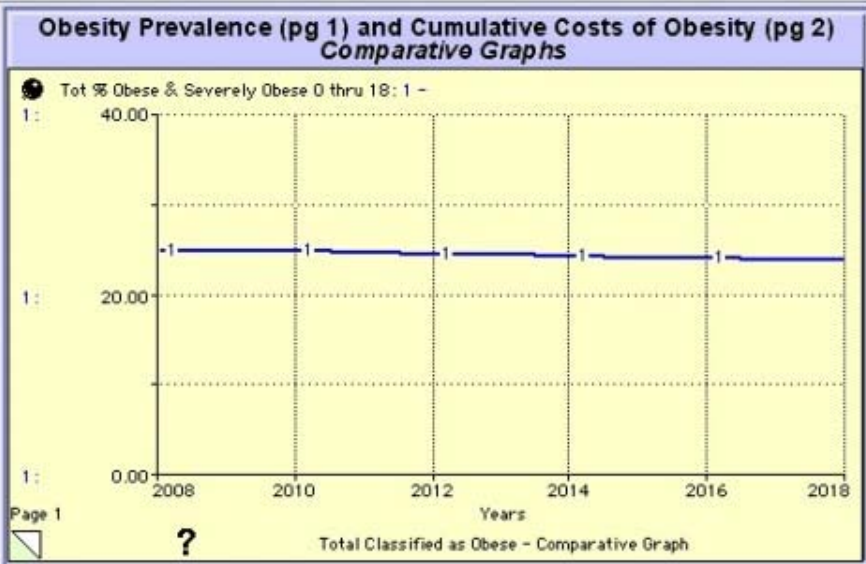
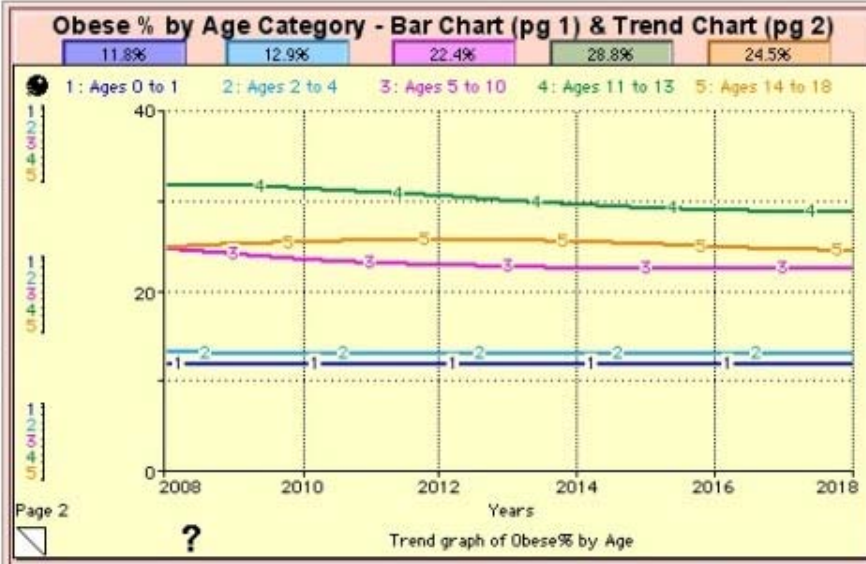
Collaborative Modeling



Policy Options

- Increase the proportion of school-aged children who walk to school.
- Reimburse for Medical Nutrition Therapy by Georgia Medicaid Care Management Organizations (CMOs).
- Impose limitations on a la carte foods sold in public schools.
- Increase the number of minutes of Physical Education (PE) in school every week and improve the quality of PE activities.
- Increase the number of licensed preschool programs that incorporate a nutrition education and physical activity component into existing curriculum.
- Increase the number of elementary and middle school children in Georgia participating in after school programs that meet specified nutrition and activity standards.

3. Practice Field: Test Policies



Instructions

Obesity Cost/Child	\$47
Annual Obesity Cost M\$	\$117
Cume Obesity Cost M\$	\$1,216

Main Performance Metrics		
Obesity %	23.8%	-0.0%
% Change in Obesity Prevalence		
Change % in Ann Cost/Child	-5.10%	\$1
Cume Savings M\$ from Intervention(s)		

Controls

Run Reset All Reset Output

Intervention Details

Review Goals

Detailed Output

School Based Policies

Physical Education

	ES	MS	HS
Keep status quo?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Add and/or Enforce reqs?	<input type="checkbox"/>	<input type="checkbox"/>	NA
Increase & Enforce PE reqs?	NA	<input type="checkbox"/>	<input type="checkbox"/>
Improve quality (more activity)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

School Nutrition Policies

% of Schools w/o a la Carte Lunch Options:

After School Programs

% of Students in Afterschool Progs:

Preschool Programs

% of Students in Preschool Progs:

Community Based Policies

Develop Safe Routes to School:

Healthcare Based Policies

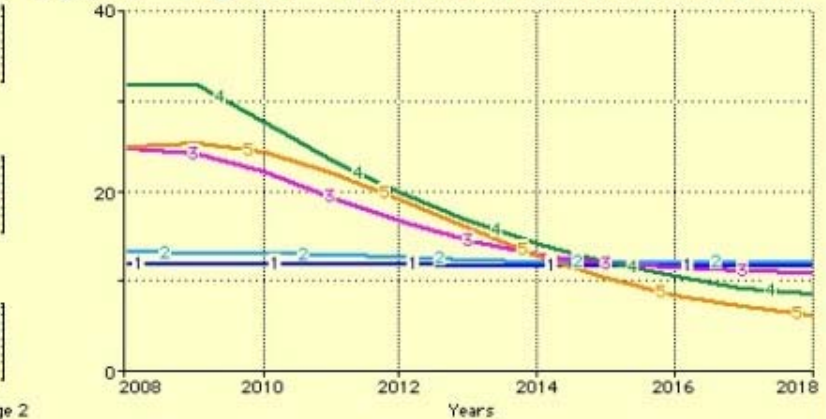
Medicaid reimbursement for nutrition counseling:

3. Practice Field: Test Policies

Obese % by Age Category - Bar Chart (pg 1) & Trend Chart (pg 2)

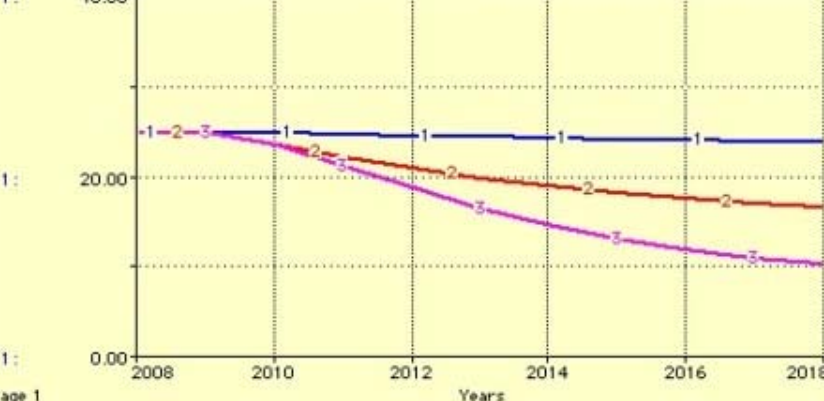
11.7% 12.0% 10.8% 8.3% 6.0%

1: Ages 0 to 1 2: Ages 2 to 4 3: Ages 5 to 10 4: Ages 11 to 13 5: Ages 14 to 18



Obesity Prevalence (pg 1) and Cumulative Costs of Obesity (pg 2) Comparative Graphs

Total % Obese & Severely Obese 0 thru 18: 1 - 2 - 3 -



Obesity Cost/Child	\$21
Annual Obesity Cost M\$	\$51
Cume Obesity Cost M\$	\$885

Main Performance Metrics		
Obesity %	10.2%	-57.2%
% Change in Obesity Prevalence		
Change % in Ann Cost/Child	-58.94%	\$332
Cume Savings M\$ from Intervention(s)		

Instructions

Controls

Run

School Based Policies

Physical Education

	ES	MS	HS
Keep status quo?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Add and/or Enforce reqs?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	NA
Increase & Enforce PE reqs?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Improve quality (more activity)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

School Nutrition Policies

U ?

% of Schools w/o a la Carte Lunch Options

After School Programs

Increase quality %

% of Students in Afterschool Progs

Preschool Programs

Increase quality %

% of Students in Preschool Progs

Community Based Policies

Develop Safe Routes to School

Healthcare Based Policies

Medicaid reimbursement for nutrition counseling

Conclusion & Implications

- This process brought together legislators, researchers, and other experts to develop a set of actionable policy options to address childhood obesity.
- Focus is not on finding “the answer” but on supporting a more rigorous conversation.


Acknowledgements

- Members of the Childhood Obesity Collaborative Systems Inquiry Team
 - Jeremy Betts, Georgia House of Representatives
 - Margie Coggins, Georgia House Budget Office
 - Rep. Sharon Cooper, R-Marietta, Chair, Health and Human Services Committee
 - Dafna Kanny, Ph.D., Georgia Division of Public Health
 - Patricia Ketsche, Ph.D., Georgia State University
 - Debra Kibbe, MS, ILSI Research Foundation
 - Mara Galic, RD, BlazeSports America
 - Rep. John Lunsford, R-McDonough
 - Kenneth Powell, M.D., MPH, Consultant
 - Robin Tanner, RD, DeKalb County Board of Health
 - Fredrick Trowbridge, M.D., Consultant
 - Jesse Weathington, Georgia House of Representatives

Contact Information

Karen J. Minyard, Ph.D.
Georgia Health Policy Center
404.413.0301
kminyard@gsu.edu

Rachel Ferencik
Georgia Health Policy Center
404.413.0307
rachel@gsu.edu



Appendix A

Weight Categories Used in the Model

Infants (0-23 months)

Data is from CDC/NHANES 2006 for Weight for Recumbent Length (WRL)

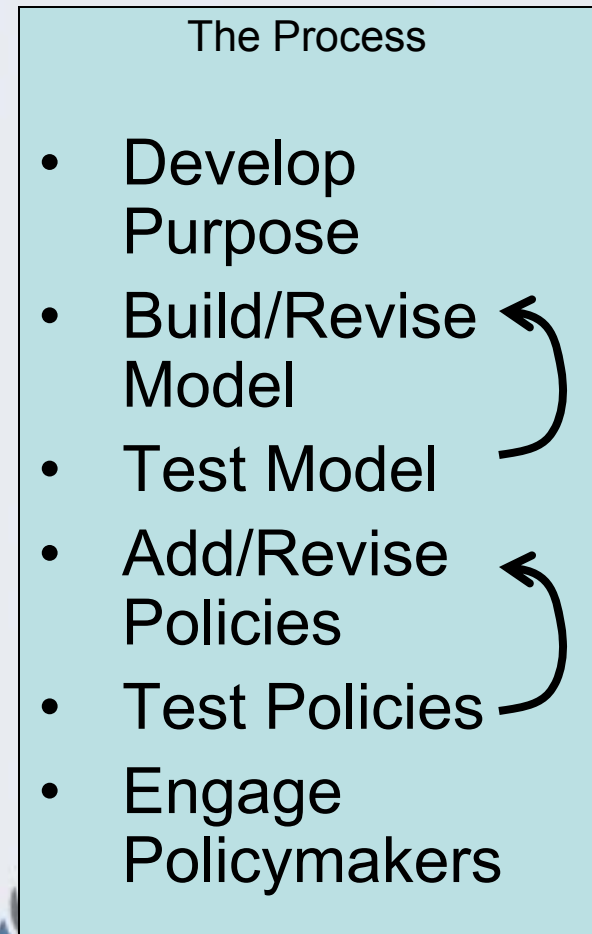
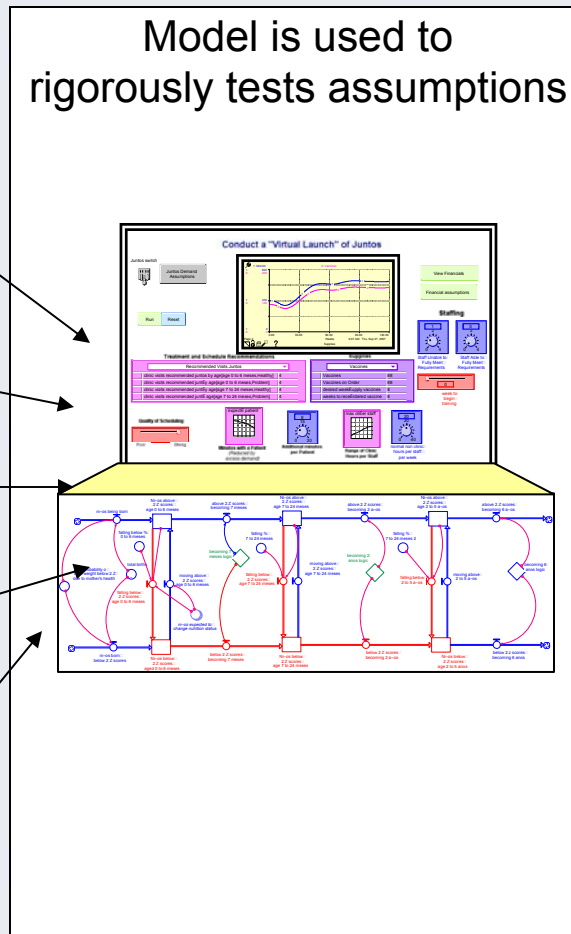
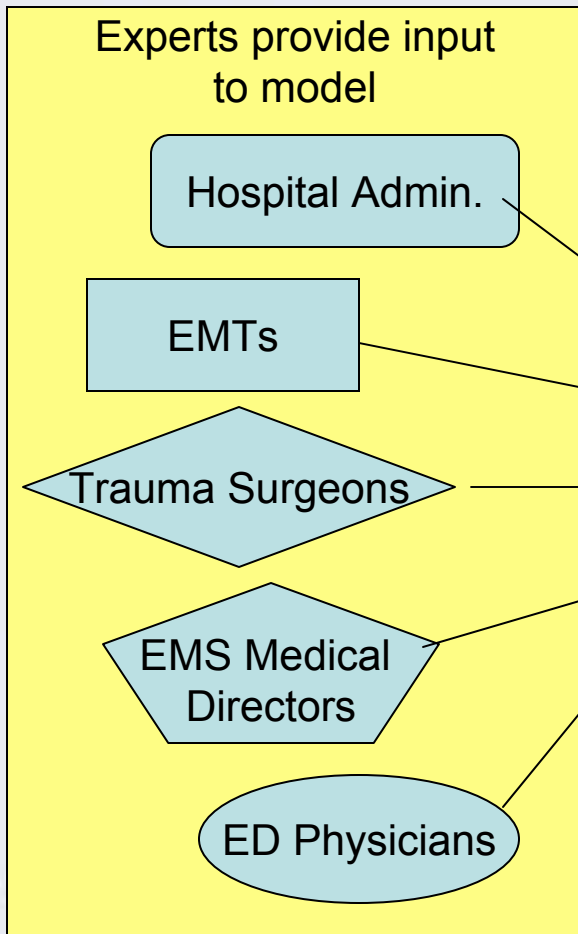
- Not overweight: $WRL < 85\text{th percentile}$;
- Moderately overweight: $WRL > 85\text{th percentile}$ and $< 95\text{th percentile}$;
- Obese: $WRL > 95\text{th percentile}$ and $< 99\text{th percentile}$;
- Severely obese: $WRL > 99\text{th percentile}$. □

Youth (2-19 years)

Based on comparison of BMI to standard growth chart percentiles.

- Not overweight: $BMI < \{85\text{th percentile or } 25\}$;
- Moderately overweight: $BMI > \{85\text{th percentile and } 25\}$ and $< \{95\text{th percentile or } 30\}$;
- Obese: $BMI > \{95\text{th percentile and } 30\}$ and $< \{99\text{th percentile or } 35\}$;
- Severely obese: $BMI > \{99\text{th percentile and } 35\}$.

Collaborative Modeling





Possible Trauma Policy Options

- Implement 2006 Field Triage decision scheme;
- Develop and implement air transport-specific protocol;
- Adhere to inter-facility transfer agreements;
- Reward through differential ambulance reimbursement for appropriate triage;
- Support more level 1 and level 2 trauma centers