



Childhood Wellness and Activity: Systems Modeling to Guide Action

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Objectives

- Examine where are we now – Current Situation
- Apply a Systems Modeling to Inform Childhood Wellness Policy and Practice
- Explore where will we go – A Vision Forward



In your opinion, what have been the biggest contributors to the increase in childhood obesity in the past 20 years?



Objective #1

**Examine where are we now:
The Current Situation**



Where are we now? Adult Obesity

**Current adult obesity rate (2015-2016):
39.8%^{1*}**

- *Without significant action*, the U.S. is on a path to 53.6% of adults being obese by 2030²

* 93.3 million of US adults

1. National Center for Health Statistics, Data Brief No. 288, October 2017. 2. F as in Fat: How Obesity Threatens America's Future 2012



Where are we now? Childhood Obesity

Current youth obesity rate (2015-16): 18.7%

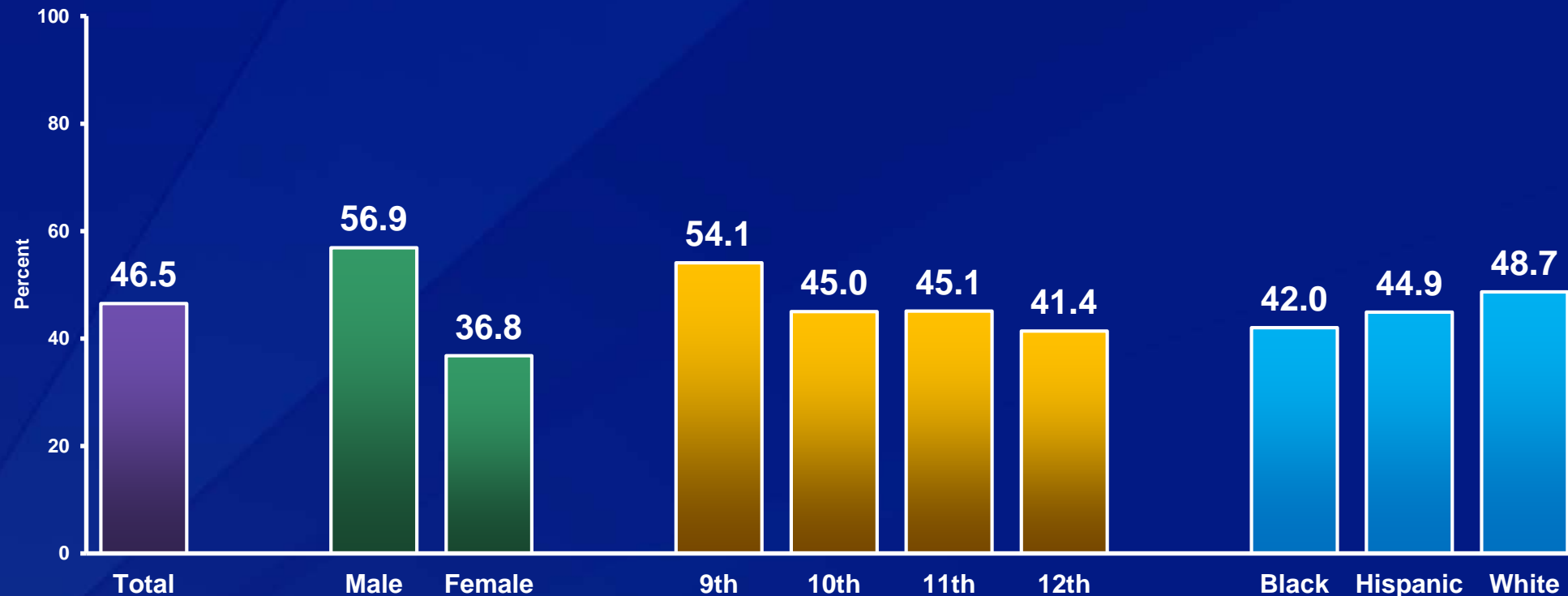
20.6% Adolescents 12-19 yrs

18.4% Children 6-11 yrs

13.9% Preschoolers 2-5 yrs

National Center for Health Statistics, Data Brief No. 288, October 2017.

Percentage of High School Students Who Were Physically Active at Least 60 Minutes Per Day on 5 or More Days,* by Sex,[†] Grade,[†] and Race/Ethnicity,[†] 2017



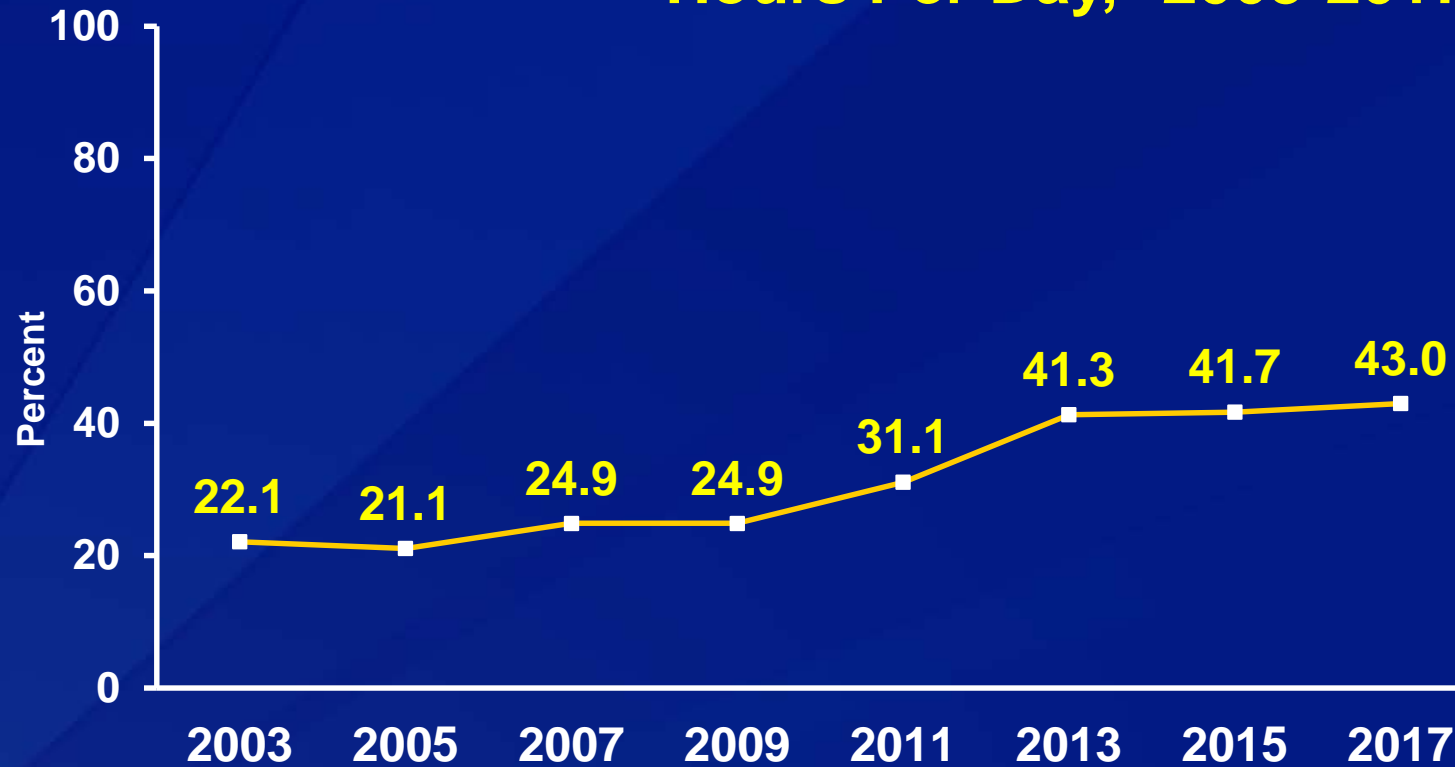
*In any kind of physical activity that increased their heart rate and made them breathe hard some of the time during the 7 days before the survey

[†]M > F; 9th > 10th, 9th > 11th, 9th > 12th, 10th > 12th, 11th > 12th; W > B (Based on t-test analysis, $p < 0.05$.)

All Hispanic students are included in the Hispanic category. All other races are non-Hispanic.

Note: This graph contains weighted results.

Percentage of High School Students Who Played Video or Computer Games or Used a Computer 3 or More Hours Per Day,* 2003-2017†

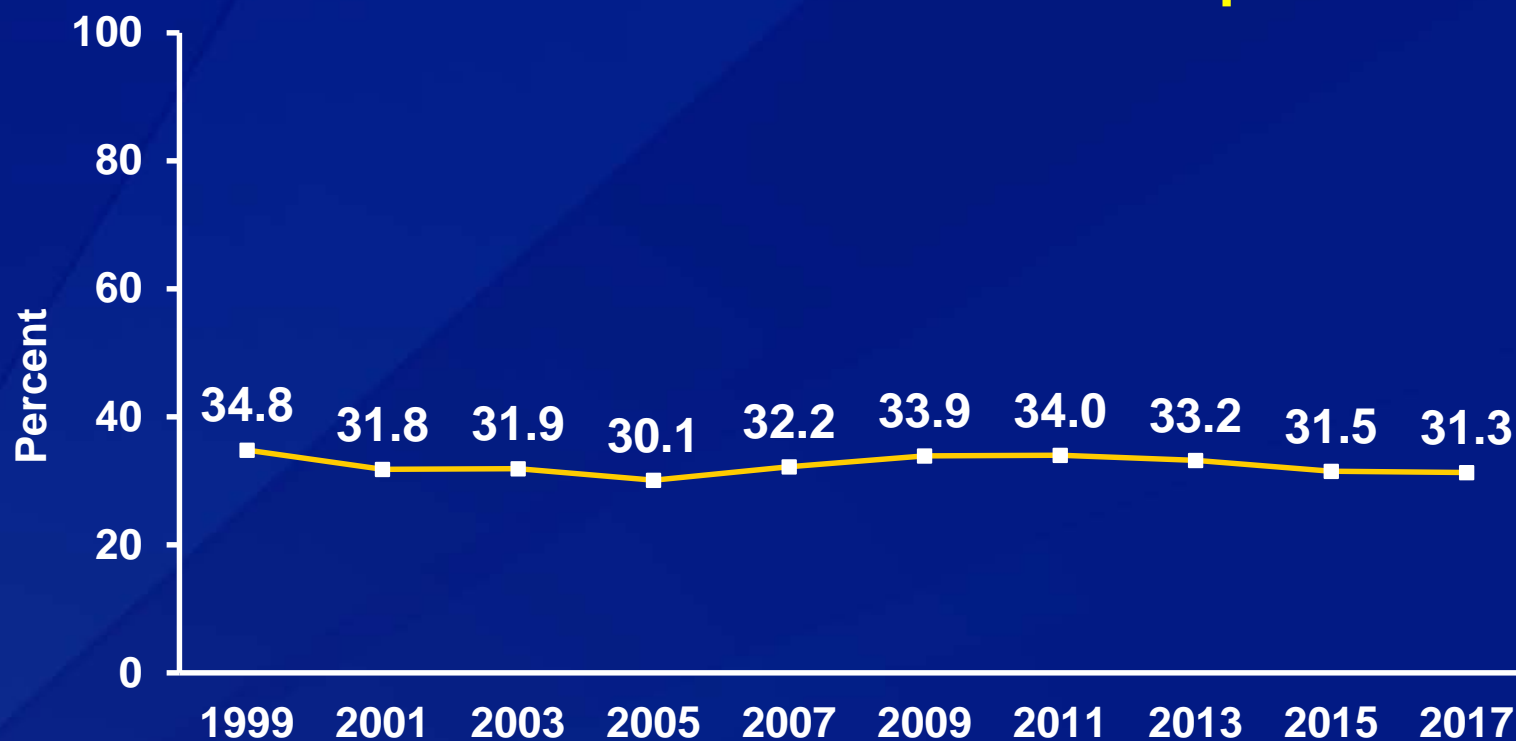


*Counting time spent on things such as Xbox, PlayStation, an iPad or other tablet, a smartphone, texting, YouTube, Instagram, Facebook, or other social media, for something that was not school work, on an average school day.

†Increased 2003-2017 [Based on linear and quadratic trend analyses using logistic regression models controlling for sex, race/ethnicity, and grade ($p < 0.05$). Significant linear trends (if present) across all available years are described first followed by linear changes in each segment of significant quadratic trends (if present).]

Note: This graph contains weighted results.

Percentage of High School Students Who Ate Fruit or Drank 100% Fruit Juices Two or More Times Per Day,* 1999-2017†

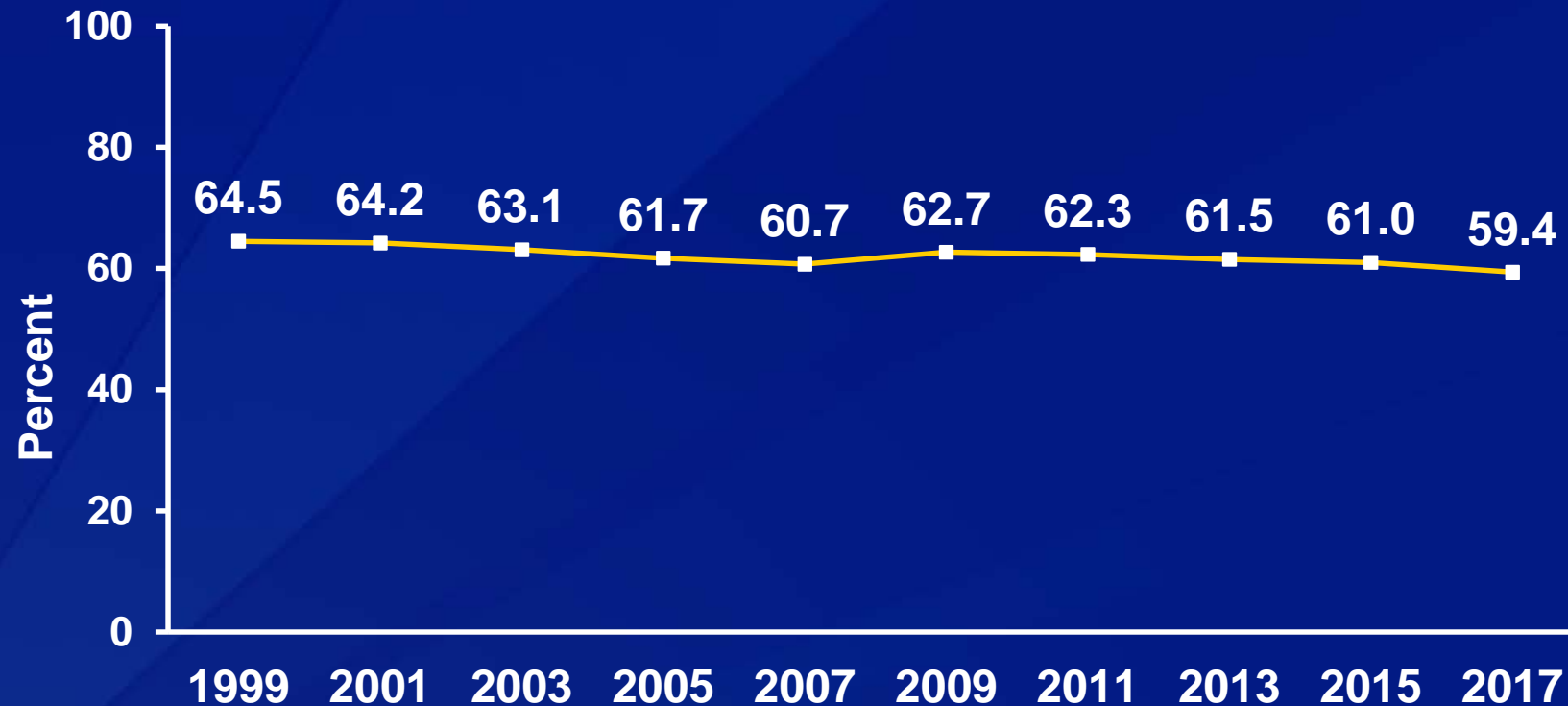


*Such as orange juice, apple juice, or grape juice, during the 7 days before the survey

†No change 1999-2017 [Based on linear and quadratic trend analyses using logistic regression models controlling for sex, race/ethnicity, and grade ($p < 0.05$). Significant linear trends (if present) across all available years are described first followed by linear changes in each segment of significant quadratic trends (if present).]

Note: This graph contains weighted results.

Percentage of High School Students Who Ate Vegetables One or More Times Per Day,* 1999-2017†



*Green salad, potatoes [excluding French fries, fried potatoes, or potato chips], carrots, or other vegetables, during the 7 days before the survey

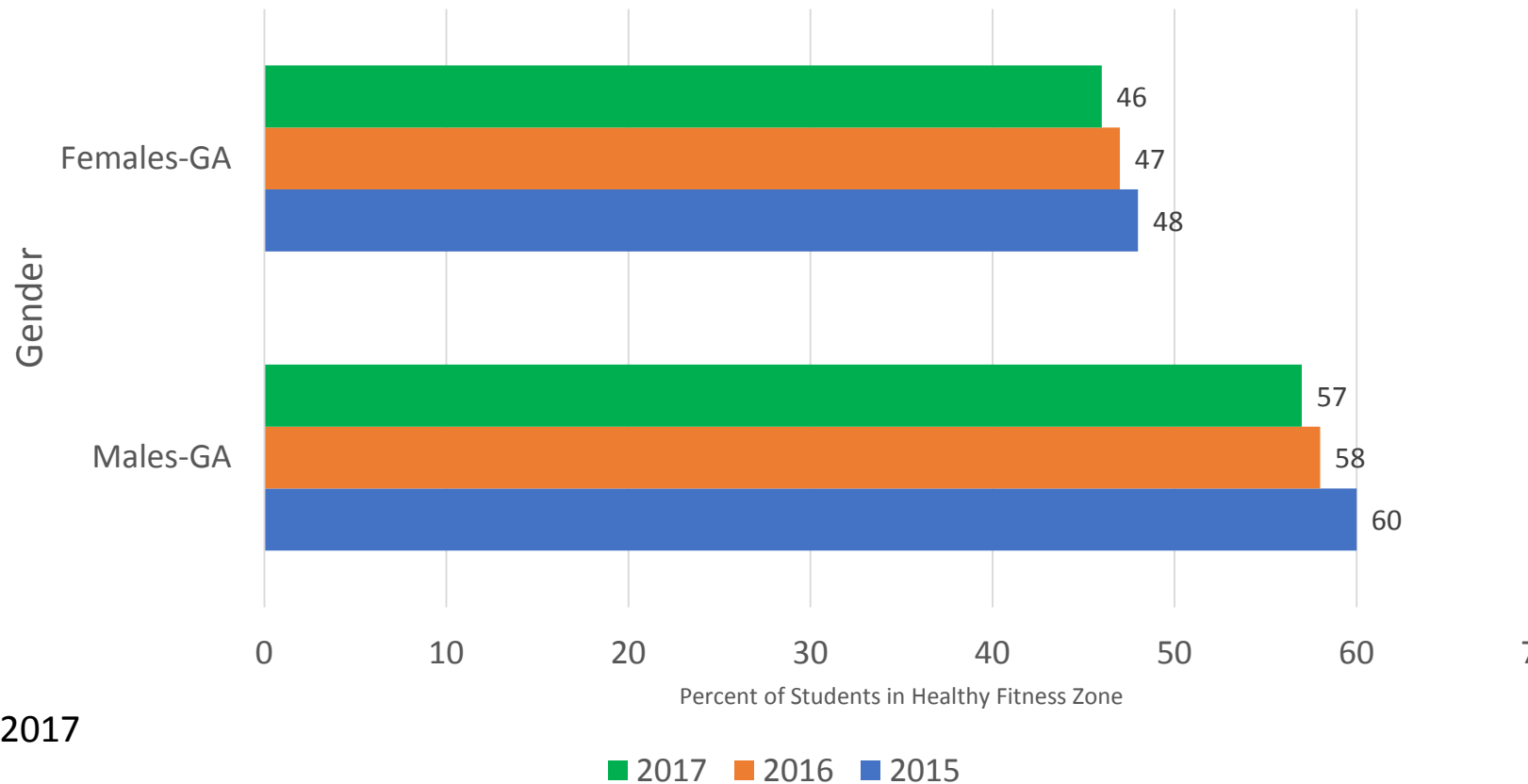
†Decreased 1999-2017 [Based on linear and quadratic trend analyses using logistic regression models controlling for sex, race/ethnicity, and grade ($p < 0.05$). Significant linear trends (if present) across all available years are described first followed by linear changes in each segment of significant quadratic trends (if present).]

Note: This graph contains weighted results.



GAPS: Behavior Change, Policies & Gender & Racial Disparities

Heart Health (Aerobic Capacity): By Gender, State of Georgia (GA)



Georgia Department of Education, FitnessGram, 2017



OBJECTIVE #2

Systems Modeling to Inform Childhood Wellness Policy and Practice



Why Create a Childhood Wellness Model?

Three reasons:

1. High prevalence of childhood obesity and inactivity in Georgia
2. State coalition was trying to identify evidence-based strategies to successfully implement
3. GA Legislators selected childhood obesity as an area of concern



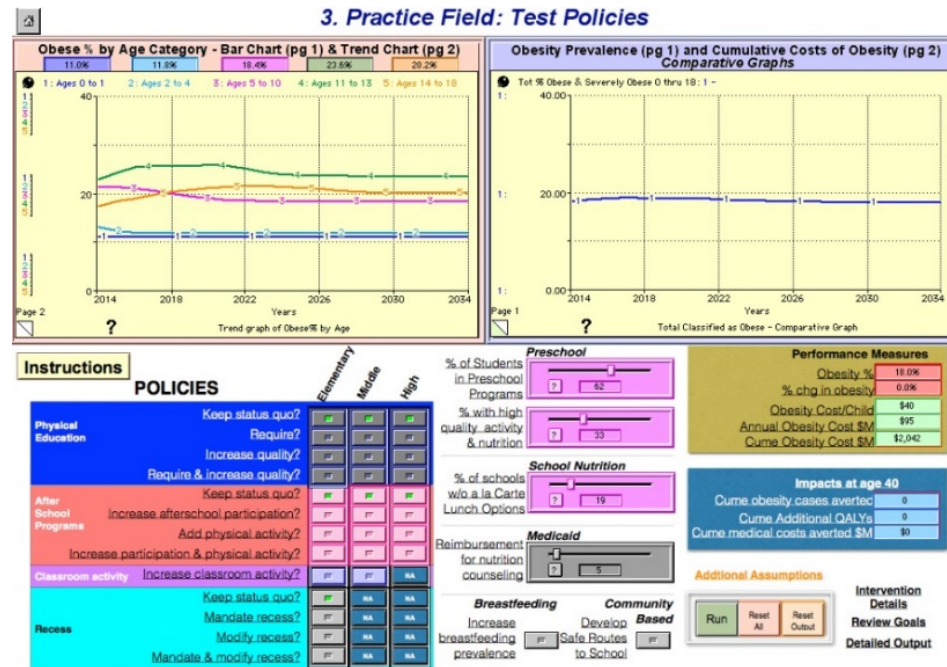
About Modeling

What modeling *can't* do

- Predict the future
- Tell you *what to do*

What modeling *can* do

- Present *assumptions* about the world using an integrated, systemic perspective
- Demonstrate the *implications* of those assumptions
 - Unintended consequences
 - Time lags
 - Possibilities for *policy resistance*
- Build *consensus* on best set of assumptions about what to do





Through Systems Modeling we can simulate & better understand impact of policies & strategies on Population Health

Model developed by Legislators and Subject Matter Experts, 2008-2009

Reference: Powell KE, **Kibbe DL**, Ferencik R, Soderquist C, Phillips MA, Vall EA, Minyard K. Systems Thinking and Simulation Modeling to Inform Childhood Obesity Policy and Practice. [Public Health Rep.](#) 2017 Nov/Dec;132(2_suppl):33S-38S. doi: 10.1177/0033354917723601.



***Background:* Childhood Wellness Systems Model**

**Focus is on systems
overseen by policy makers:**

- **Education:**
 - Public Schools
 - Georgia Pre-K (Lottery \$)
 - Afterschool Programs
- **Healthcare:**
 - Medicaid
 - MCH/WIC
- **Transportation:**
 - Safe Routes to Schools



Background

Childhood Wellness Systems Model

- **2007:** \$ from the Healthcare GA Fdn to build upon the work of the Legislative Health Policy Certificate Program (LHPCP)
- LHPCP participants chose childhood obesity as an “issue of interest”
- Team of 12 (mostly volunteers) worked for 5 months on developing the model & supporting materials
- Childhood Obesity Systems Model project provided:
 - A tool for legislators to be trained in basic systems
 - An opportunity for more rigorous discussion about an important policy issue



Background

Childhood Wellness Systems Model

- **2014:** GHPC received grants from Woodruff Fdn & GDPH to update the model
 - Updated literature reviews for “assumptions documents” for all levers/interventions
 - Fitness assessment data collected on GA students 2011 to 2014 informs the model
 - *New Levers Added:* Breastfeeding, Classroom-based physical activity, Recess



What's in the Model?

**Strategies that have evidence of Impact on
Body Mass Index (BMI) for age Percentile**

-- *those that change BMI* --

Handout



List of Policy Options*

Interventions in schools, communities and health care selected for use in the model. They include:

- Increase the proportion of school-aged children who walk or ride bikes to school
- Reimburse for medical nutrition therapy by Medicaid Care Management Organizations (CMOs)
- Impose limitations on competitive foods sold in school
- Require daily physical education (PE) and/or improve the quality of PE activities
- Increase the participation in after school programs and/or add physical activity to programs currently lacking such activity
- Increase the participation in preschool programs with physical activity
- Increase classroom physical activity
- Require recess and/or modify existing recess time
- Increase breastfeeding prevalence at 6 months of age

* Often called “**levers**” in modeling



Group Activity: **Childhood Wellness Systems Model**

1. Choose a **preferred policy**
2. Graph what you think will happen to Childhood Obesity Prevalence over 20 years
 - Starting = 18%
 - Ending = %
3. **Combine policies** to come up with a “preferred set” of recommendations

Handout



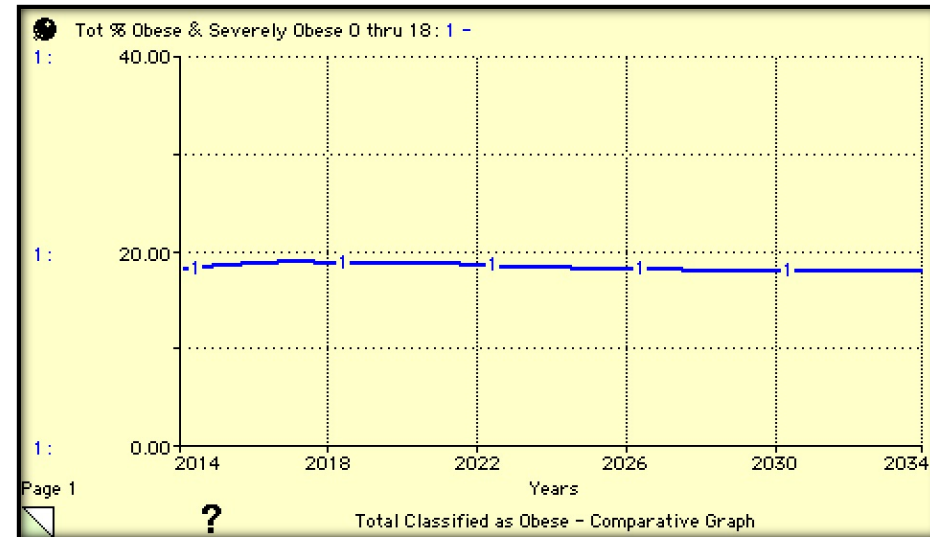
Preferred “one” policy

Preferred Policy _____

In your small groups...

- Write down your preferred policy
- On the graph, **sketch your prediction** on how the obesity % will change over the next 10 years, compared to the baseline (blue line).

Obesity % of Population (Ages 0-18)



- Why do you **expect** this change?

- What are the **financial implications** of this policy?

Now test it and record your observations in the first row on the following page



You are now a Legislator from a Rural Area, you know:

1. Obesity impacts far more youth than any other health condition
2. Limited funding is available to support child health efforts
3. Political preferences & barriers must be considered – consider “what legislators are ready to support”
4. Constituents’ are concerned about child health but education is top concern



Activity #1

As a group of Legislators from Rural Areas...

Revisit the preferred “one” policy you selected, do you want to stick with that policy or will you change it?



**Which group wants to
“virtually” test their policy in
the model first?**



List of Policy Options*

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* Often called “**levers**” in modeling



Before test more policies....

**Did your group consider
“*Intervention Strength?*”**

DOSE X REACH

Number of
“touches” or doses
of intervention

Number of children
“touched” by
intervention



Test your policy....

- Increase the proportion of school-aged children who walk or bike to school
- Reimburse for medical nutrition therapy by Medicaid Care Management Organizations (CMOs)
- Impose limitations on competitive foods sold in school
- Require daily PE and/or improve the quality of PE activities
- Increase the participation in after school programs and/or add PA to programs currently lacking such activity
- Increase the participation in preschool programs with quality PA & Nutrition
- Increase classroom PA
- Require recess and/or modify existing recess time
- Increase breastfeeding prevalence at 6 months of age



➤ **Legislators:**

What did you learn by using the model?

What's not in the model?



Objective #3

Explore where will we go from here – A Vision Forward



Discussion of the policies in rural areas....

- Increase the proportion of school-aged children who walk or bike to school
- Reimburse for medical nutrition therapy by Medicaid Care Management Organizations (CMOs)
- Impose limitations on competitive foods sold in school
- Require daily PE and/or improve the quality of PE activities
- Increase the participation in after school programs and/or add PA to programs currently lacking such activity
- Increase the participation in preschool programs with quality PA & Nutrition
- Increase classroom PA
- Require recess and/or modify existing recess time
- Increase breastfeeding prevalence at 6 months of age



Discussion of policies in rural areas....

- What other policies, strategies, activities can be used in rural areas to impact child and adolescent population health?



QUESTIONS?



**Thank
You!!!**

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