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 2030\(^2\)

* 93.3 million of US adults

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.

National Youth Risk Behavior Survey, 2017
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.

CDC, National Youth Risk Behavior Surveys, 2003-2017
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.

CDC, National Youth Risk Behavior Surveys, 1999-2017
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.

CDC, National Youth Risk Behavior Surveys, 1999-2017
GAPS: Behavior Change, Policies & Gender & Racial Disparities

Georgia Department of Education, FitnessGram, 2017

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

- Males-GA: 2017 - 57, 2016 - 58, 2015 - 60

Percent of Students in Healthy Fitness Zone
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* 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

What modeling *can’t* do

- Predict the future
- Tell you 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

**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

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).

  • 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 \times \text{REACH}

\text{DOSE} \quad \text{Number of “touched” or doses of intervention}

\text{REACH} \quad \text{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?

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