

Dec. 9, 2015

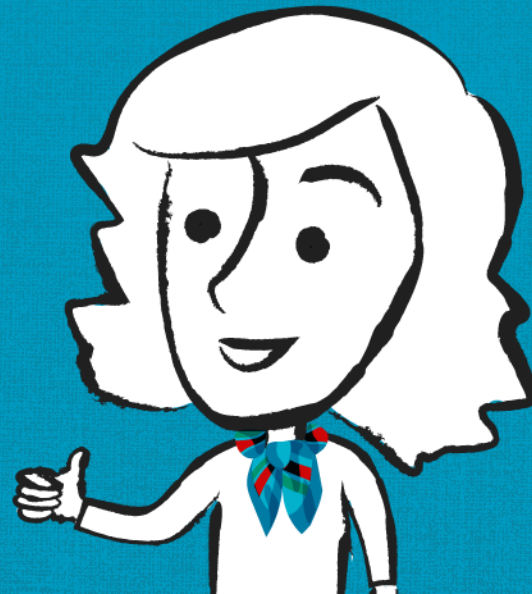


Connecting you with experts. Exploring the latest childhood obesity news and research.

We will begin at 3:05 p.m. to allow participants time to join the webinar.

- **Spotlight: New Cost-Effectiveness and Impact Estimates for Childhood Obesity Interventions**
- **One on One**
- **What's Next?**
  - **What's Ahead for NCCOR in 2016**
  - **Call for Papers: Youth Energy Expenditure**
  - **NCCOR's Catalogue of Surveillance Systems**

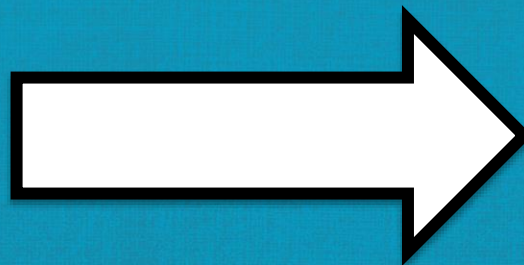
# TODAY'S PROGRAM





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# Today's Speakers



**Elaine Arkin**

National Collaborative on Childhood Obesity Research



**Steven Gortmaker, PhD**

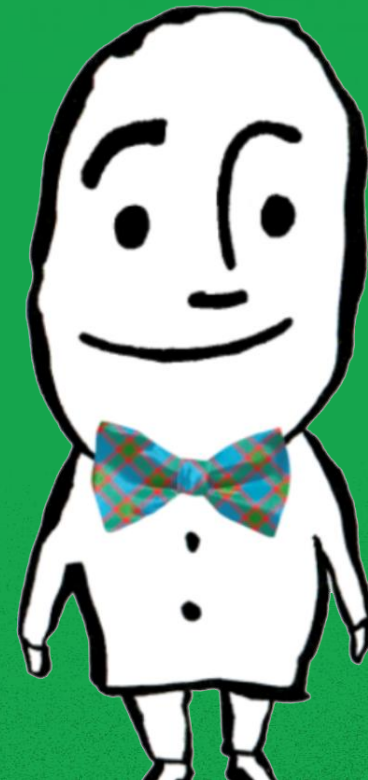
Professor, Practice of Health Sociology,  
Department of Social and Behavioral Sciences  
Harvard T. H. Chan School of Public Health,  
Director, Harvard Prevention Research Center  
Lead Investigator, CHOICES

# Interactive Poll

Today's Poll ☰

How familiar are you with today's topic?

<input type="radio"/> Very Familiar	<div style="width: 0%;"></div>	0%	(0)
<input type="radio"/> Somewhat Familiar	<div style="width: 0%;"></div>	0%	(0)
<input type="radio"/> Not Familiar	<div style="width: 0%;"></div>	0%	(0)
<input checked="" type="radio"/> No Vote			





**How familiar are you with today's topic?**

**A) Very familiar**

**B) Somewhat familiar**

**C) Not familiar**





# ***New Cost-Effectiveness and Impact Estimates for Childhood Obesity Interventions***

**Steven Gortmaker, PhD**  
**Professor, Practice of Health Sociology,**  
**Harvard T. H. Chan School of Public Health,**  
**Director, Harvard Prevention Research Center**  
**Lead Investigator, CHOICES**

# Financial Disclosures

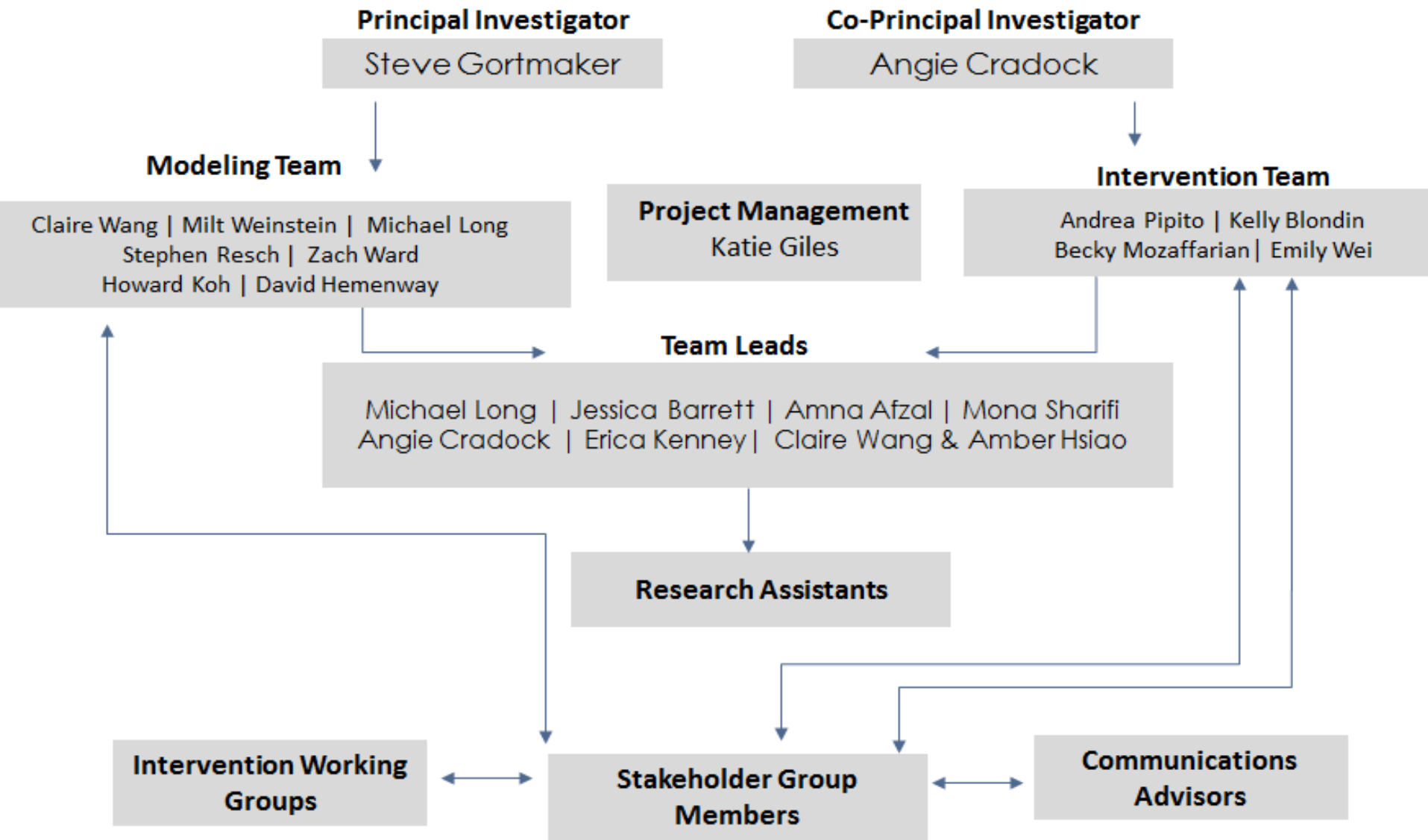
- This work was supported in part by grants from The JPB Foundation, the Robert Wood Johnson Foundation (#66284), the Donald and Sue Pritzker Nutrition and Fitness Initiative, and the Centers for Disease Control and Prevention (CDC) (U48DP001946), including the Nutrition and Obesity Policy, Research, and Evaluation Network. This work is solely the responsibility of the authors and does not represent official views of the CDC or any of the other funders.



# CHOICES Model

- Examine obesity programs and policies high on national agenda
- Systematic evidence reviews — generally used randomized trials and natural and quasi-experimental evaluations
- Projected impact of effectiveness, population reach, cost, and cost-effectiveness over the next decade

# The CHOICES Team





# Obesity in the United States

- At historically high levels
- Excess weight accumulates slowly
  - In young children energy gap is small — **33 kcal/day**<sup>1</sup>
  - By adolescence, excess has accumulated for more than a decade — average imbalance **200 extra kcal/day**<sup>1,2</sup>
  - For adults more substantial energy gap (for 14% with BMI >35, **500 kcal/day**)<sup>2</sup>
  - Prevention should be the focus

Source: <sup>1</sup> Wang, Orleans, Gortmaker 2012; <sup>2</sup> Hall et al 2013

# A Complex Issue

- Multiple risk behaviors shaped by multiple environments
- Requires multiple intervention strategies
- Hundreds of obesity treatment and prevention initiatives implemented with limited evaluative information
- Relative costs or cost-effectiveness of strategies generally not considered



# CHOICES

- Which childhood obesity prevention policies and programs will result in the best value for decision makers to implement?
- “Value for money, value for many”<sup>1</sup>

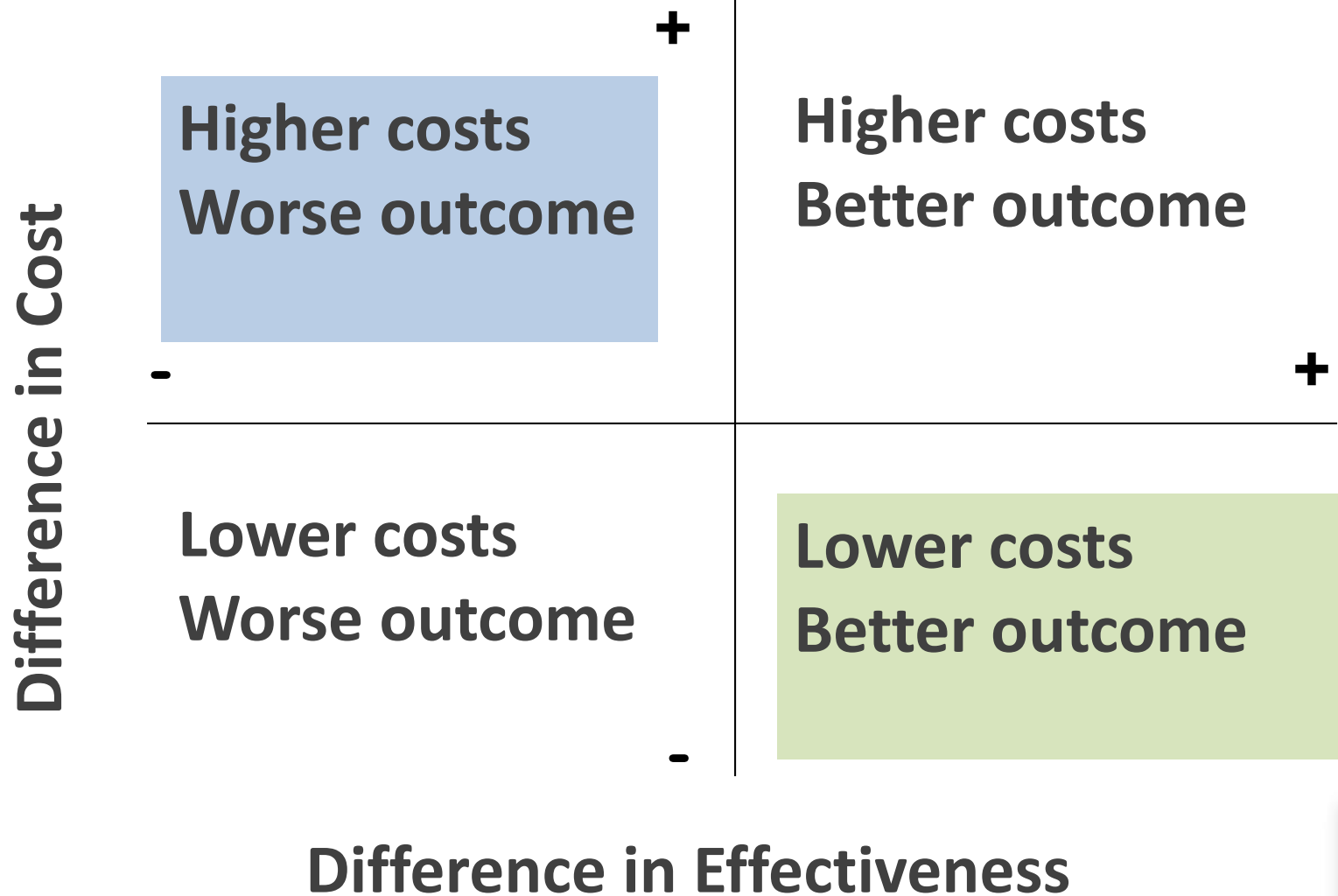
Source: <sup>1</sup>Atun, R. 2015

# Cost-Effectiveness Analysis

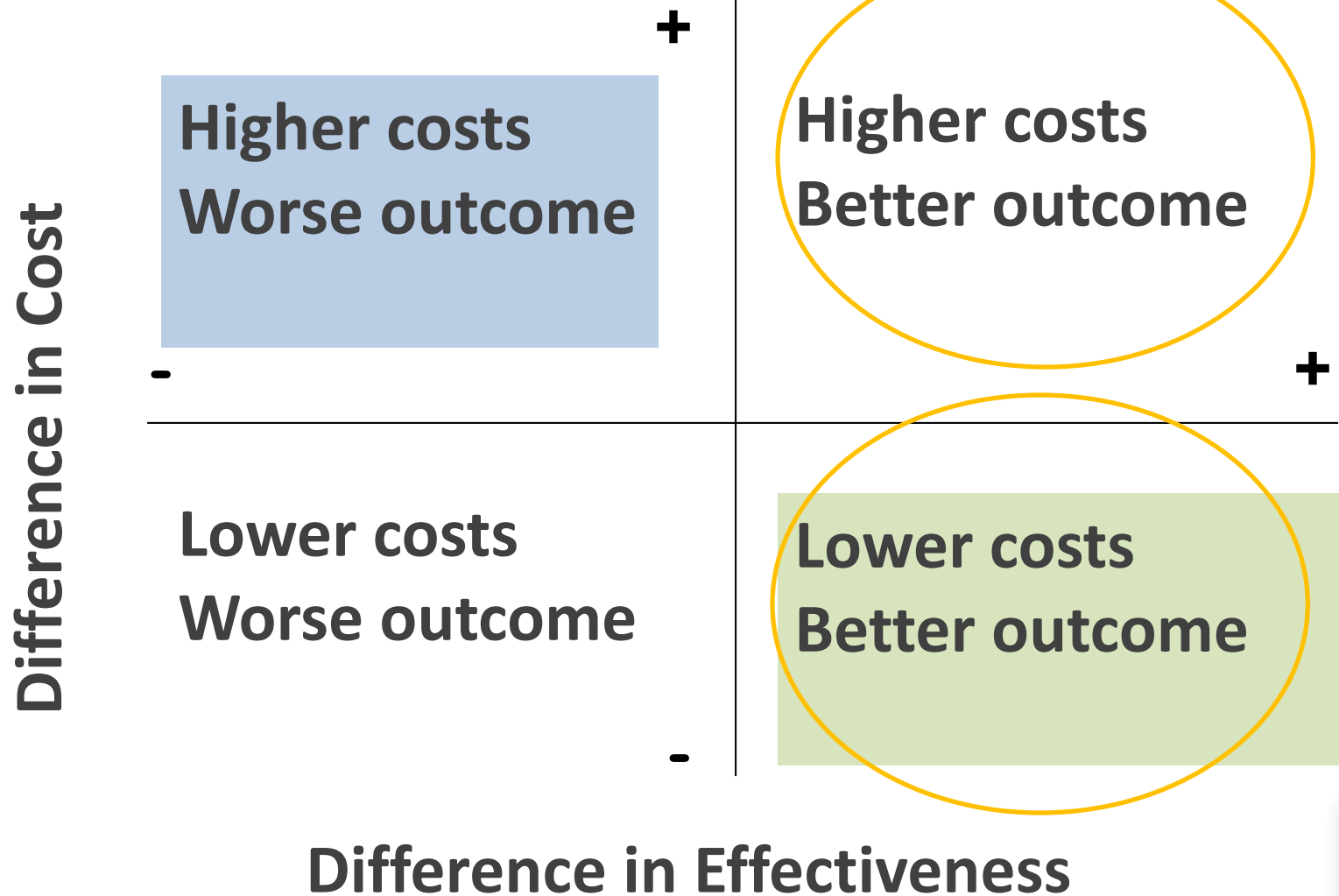
- Compares the relative costs and outcomes of two or more courses of action to estimate the value of public health programs or policies



# Cost-Effectiveness Analysis



# Cost-Effectiveness Analysis





# CHOICES' Approach

- Identify the best value among 40+ most relevant childhood obesity prevention interventions in the United States
- Intervention settings:
  - School
  - Transportation
  - Clinical
  - Community & government
  - Early and out-of-school care

# Intervention Selection Process

- Conduct preliminary evidence review
- Convened expert stakeholder group
- Assessed 75 intervention strategies based on:
  - Evidence for effect on BMI, energy intake, and/or energy expenditure
  - Interest to decision makers
  - Impact on obesity and/or physical activity
  - Potential for clear specification
  - Program logic
  - Feasibility
  - Effects on disparities
  - Sustainability
  - Potential for side effects
  - Acceptability
- Selected 40+ strategies for modeling

# Results

- Selection of CHOICES model results for:
  - School
  - Early care and education
  - Community & government
  - Clinical treatment



# School Interventions

Intervention Name	Description
School Meals	Implementation of Federal Nutrition Standards in the National School Lunch and Breakfast Programs as part of the 2010 Healthy Hunger-Free Kids Act, per the USDA Final Rule issued January 2012
Smart Snacks	Implementation of the national USDA Smart Snacks in School regulation (part of the 2010 Healthy Hunger-Free Kids Act), as specified in the USDA Interim Final Rule issued June 2013

# Early Care & Education Interventions

Intervention Name	Description
NAPSACC	Require completion of the Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC) Program for certification from state Quality Rating and Improvement Systems (QRIS) for ECE

# Community & Government Interventions

Intervention Name	Description
Menu Labeling	Implementation of federal menu labeling regulations for restaurants and other venues serving prepared foods with 20 or more locations, which require listing calories per item and suggested daily total calorie intake anchor
Ad Exposure	Elimination of existing federal television advertising tax subsidy for unhealthy foods and beverages targeted at children ages 2 to 19
SSB Tax	Implement a national sugar-sweetened beverage excise tax of 1 cent per ounce



# Clinical Interventions

Intervention Name	Description
Bariatric Surgery	Perform bariatric surgery (including Roux-en-Y gastric bypass, laparoscopic adjustable gastric banding, and sleeve gastrectomy) to treat eligible, obese adolescents ages 13 to 19 years

# CHOICES Metrics

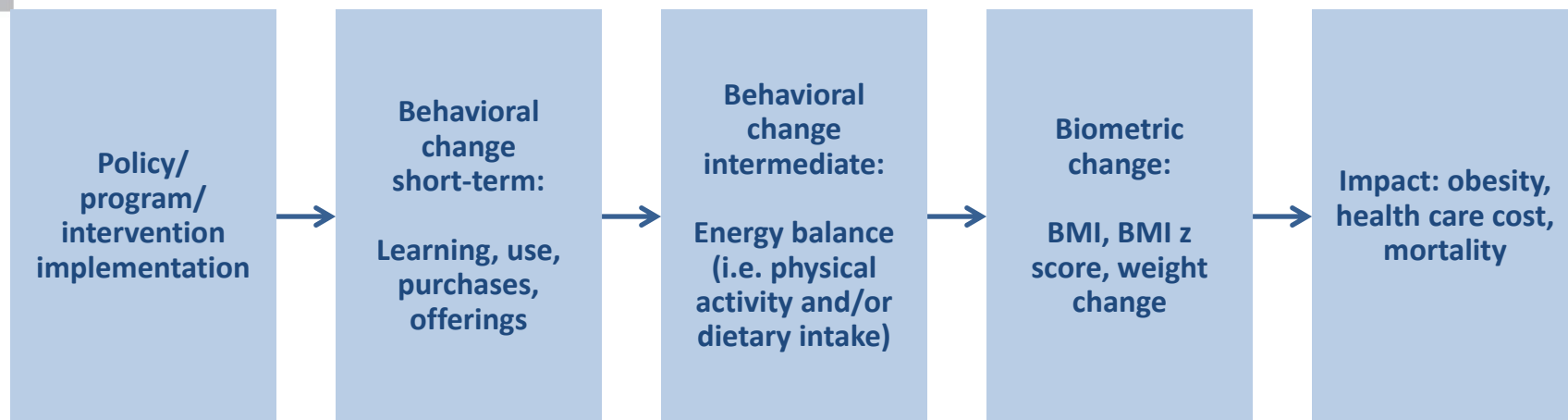
Metric	Definition
Cases of Childhood Obesity Prevented	Cases of children with obesity in 2025 prevented by the intervention
Health Care Cost Savings per \$1 Invested	Amount of health care cost savings from reduced obesity prevalence for every \$1 invested in implementing the intervention
Intervention Cost per BMI Unit Reduction Per Person	Two-year annualized intervention costs per person receiving the intervention divided by the mean BMI unit reduction per person

# CHOICES Model Inputs

- **Effect:** Expected impact on BMI or energy balance
- **Reach:** Number of people affected
- **Cost:** Resources required to implement



# Logic Models



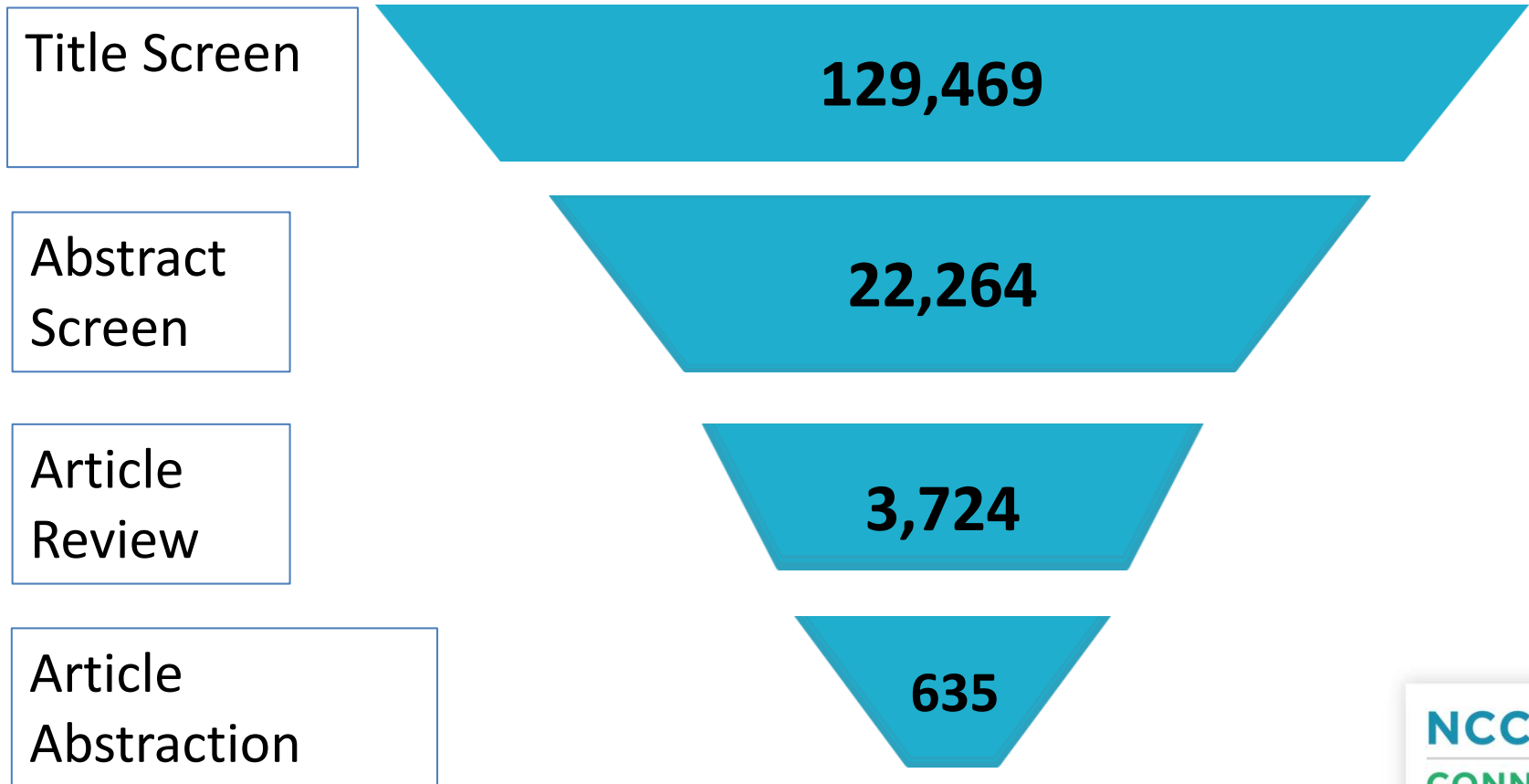
- Identify steps between intervention implementation and health outcomes
- Integrate evidence along multiple pathways

# Systematic Evidence Reviews

- Conducted for each intervention to determine effect on BMI/BMIz or energy balance based on dietary intake and physical activity changes
- Prioritized evidence from
  - Experimental and quasi-experimental or natural experiments

# CHOICES Systematic Review

## 43 Interventions





# CHOICES' Model Inputs

- **Effect:** Expected impact on BMI or energy balance
- **Reach:** Number of people affected
- **Cost:** Resources required to implement

# CHOICES' Model Inputs

- **Effect:** Expected impact on BMI or energy balance
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# Cost

- Cost of activities required to implement intervention
- Modified societal perspective on costs
- Includes all costs regardless of payer
- Does not include cost of intervention participants' time



# CHOICES' Model

- Determine inputs
  - Reach
  - Effect
  - Cost
- Model impact of intervention on BMI, obesity rates, mortality, and health care costs

# Microsimulation

- Models individual people over 2015-2025
- Calculates uncertainty intervals using Monte Carlo simulations programmed in JAVA
- More than 1,000 iterations for population of 1,000,000 simulated individuals scaled to national population size
  - Can represent population heterogeneity
  - Geographic location (state-specific model estimates)
  - Intervention effects on disparities
  - Individual-level body measures and behaviors

# Microsimulation

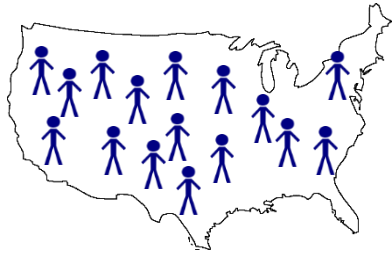
- Models use data from:
  - U.S. Census and American Community Survey
  - Behavioral Risk Factor Surveillance System
  - National Health and Nutrition Examination Surveys
  - National Survey on Children's Health
- Longitudinal data concerning weight and height from:
  - National Longitudinal Survey of Youth
  - National Longitudinal Study of Adolescent to Adult Health
  - Early Childhood Longitudinal Study-Kindergarten
  - Panel Survey on Income Dynamics
  - NHANES I Epidemiologic Follow-Up Study
- Health care costs from the Medical Expenditure Panel Survey
- Smoking initiation and cessation rates from the National Health Interview Surveys
- Mortality rates by smoking and BMI from the NIH-AARP Diet and Health Study.



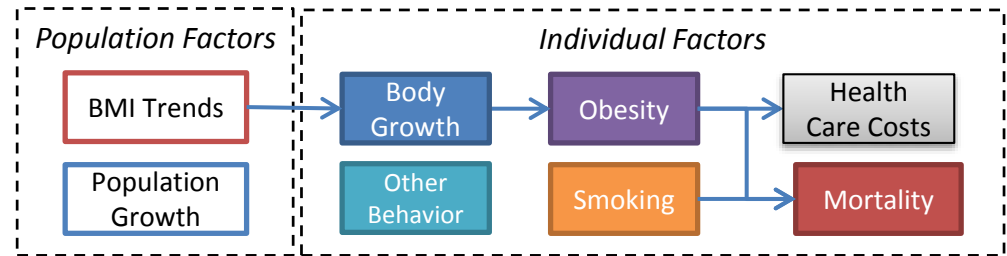
# Analytic Framework

## Baseline scenario

2010 Virtual US Population

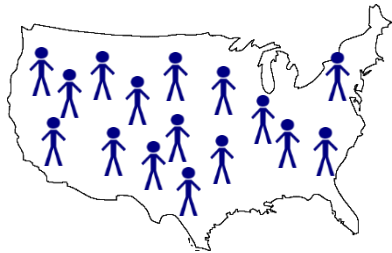


Simulate Forward to 2025



## Intervention scenario

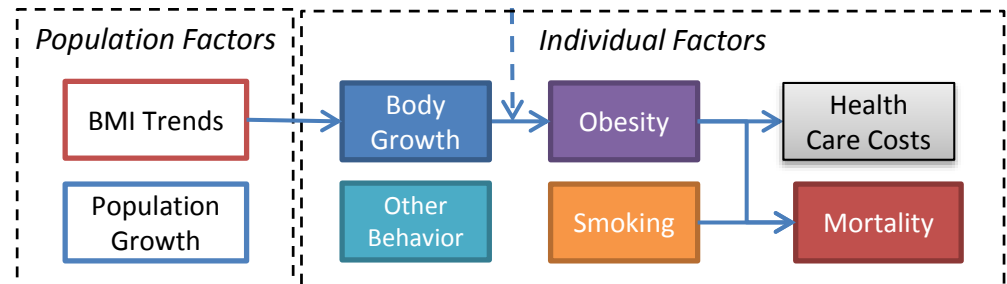
2010 Virtual US Population



2015: Start Intervention

Intervention

Simulate Forward to 2025



## Model outcomes

### Intervention

- Population reach
- Annual costs

### Short-term

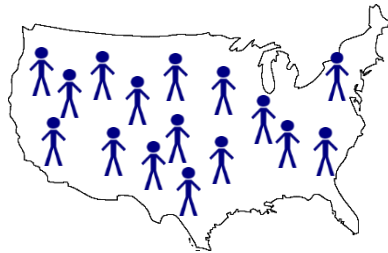
- BMI reduction

### Long-term

- Health care costs averted
- Years with obesity prevented
- Change in obesity prevalence

# Intervention

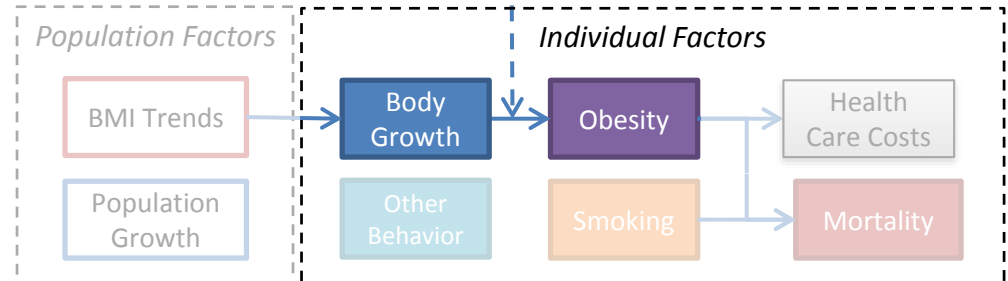
2010 Virtual US Population



2015: Start Intervention

Intervention

Simulate Forward to 2025



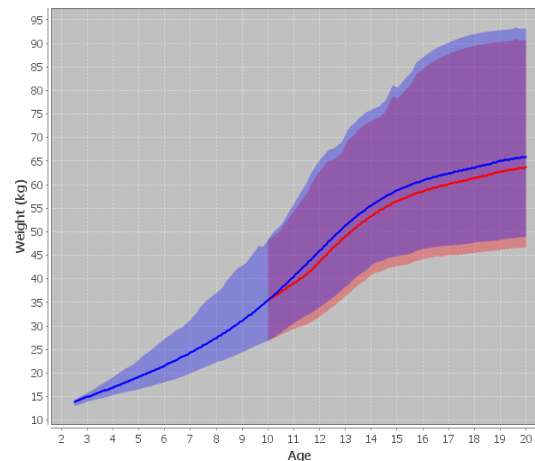
Effect Example: Reduction of 1 unit of BMI over 18 months (starting at age 10) and maintenance

Intervention specification:

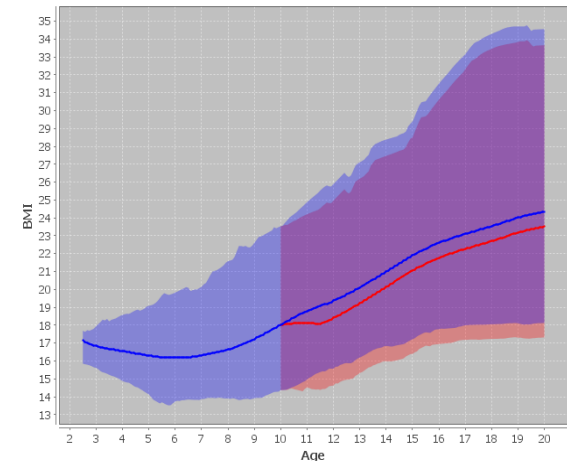
- Recruitment
- Cost
- Effect

Sample intervention parameters in each iteration to account for uncertainty

Weight



BMI



# Approaches to Reducing Childhood Obesity Prevalence

- Two main approaches:
  - Treating obesity after onset (example: bariatric surgery)
  - Preventing excess BMI/weight gain through policy and programmatic interventions



# Bariatric Surgery

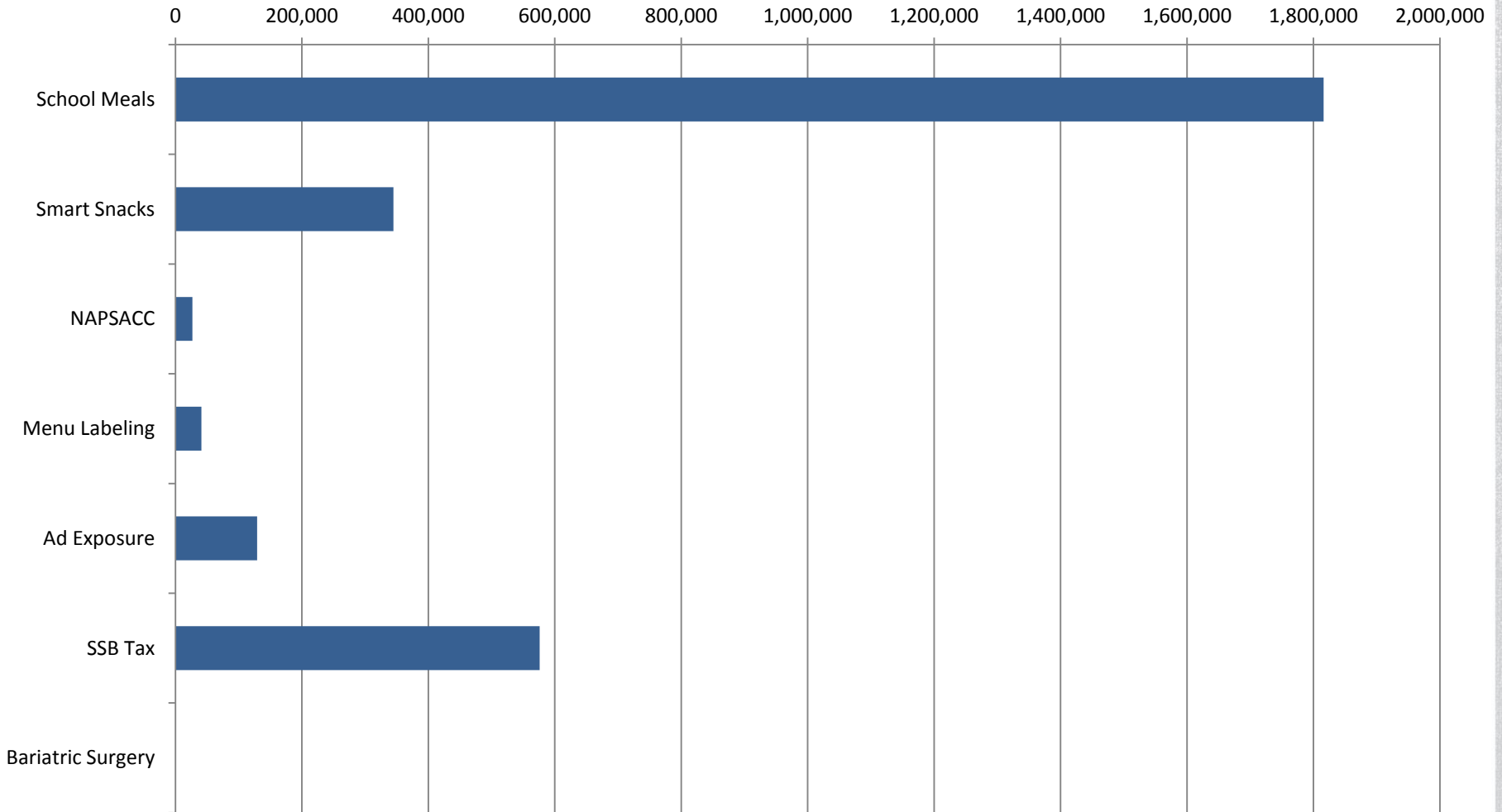
- One treatment approach evaluated by CHOICES
- Among eligible 13 to 19 year-olds with obesity (BMI of 40 or greater)
- Perform bariatric surgery (including Roux-en-Y gastric bypass, laparoscopic adjustable gastric banding, and sleeve gastrectomy)
- Assumes 4-fold increase in adolescents receiving procedure

# Impact of Bariatric Surgery

- Has a large effect on reducing BMI for those who receive it (mean reduction of 14.5 BMI units)
- But it does not substantially reduce obesity prevalence
- Of eligible adolescents, only 1 in 500 receive the surgery<sup>1</sup>
- It is costly: \$1,611 per BMI unit change<sup>1</sup>
- Preventive interventions have smaller effects, but can reduce obesity prevalence because they reach millions of children

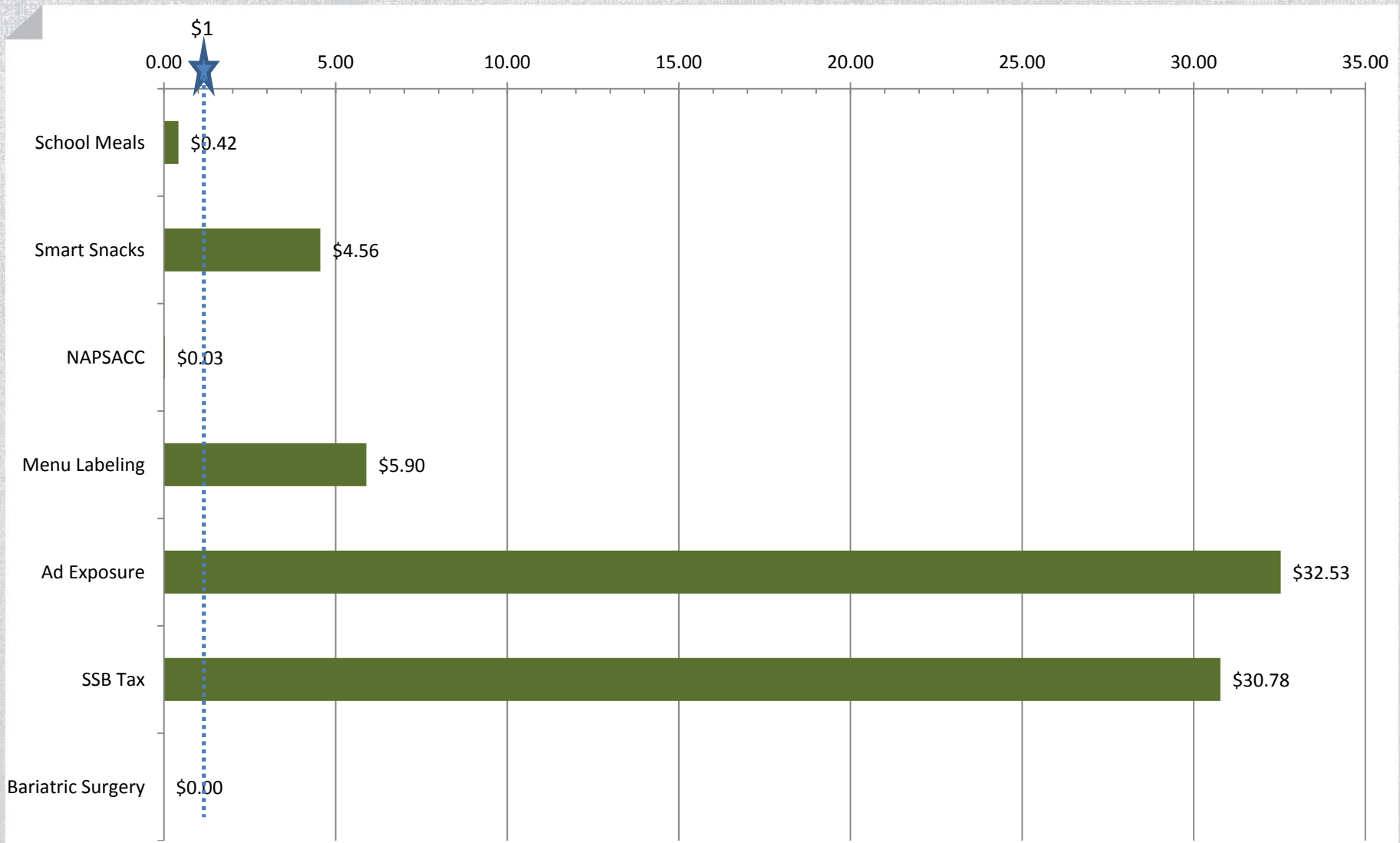
**Source:** <sup>1</sup>Gortmaker SL, Wang YC, Long MW, Giles CM, Ward ZJ, Barrett JL, Kenney EL, Sonnevile KR, Afzal AS, Resch SC, Cradock AL. Three Interventions That Reduce Childhood Obesity Are Projected to Save More Than They Cost to Implement. *Health Affairs*, 34, no. 11 (2015):1304-1311.

# Cases of Childhood Obesity Prevented

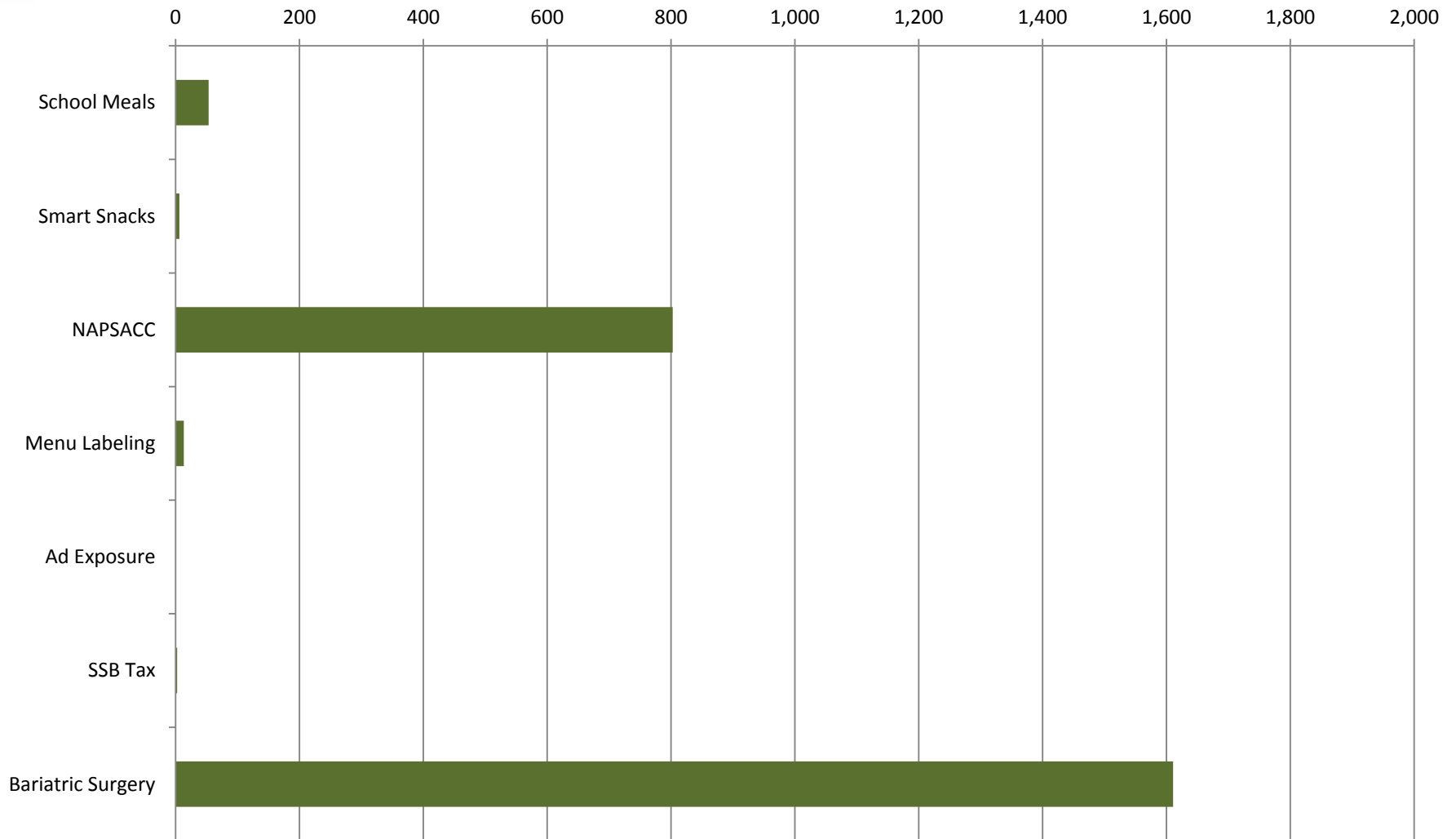




# Health Care Cost Savings per \$1 Invested



# Cost per BMI Unit Reduced



# Importance of Prevention

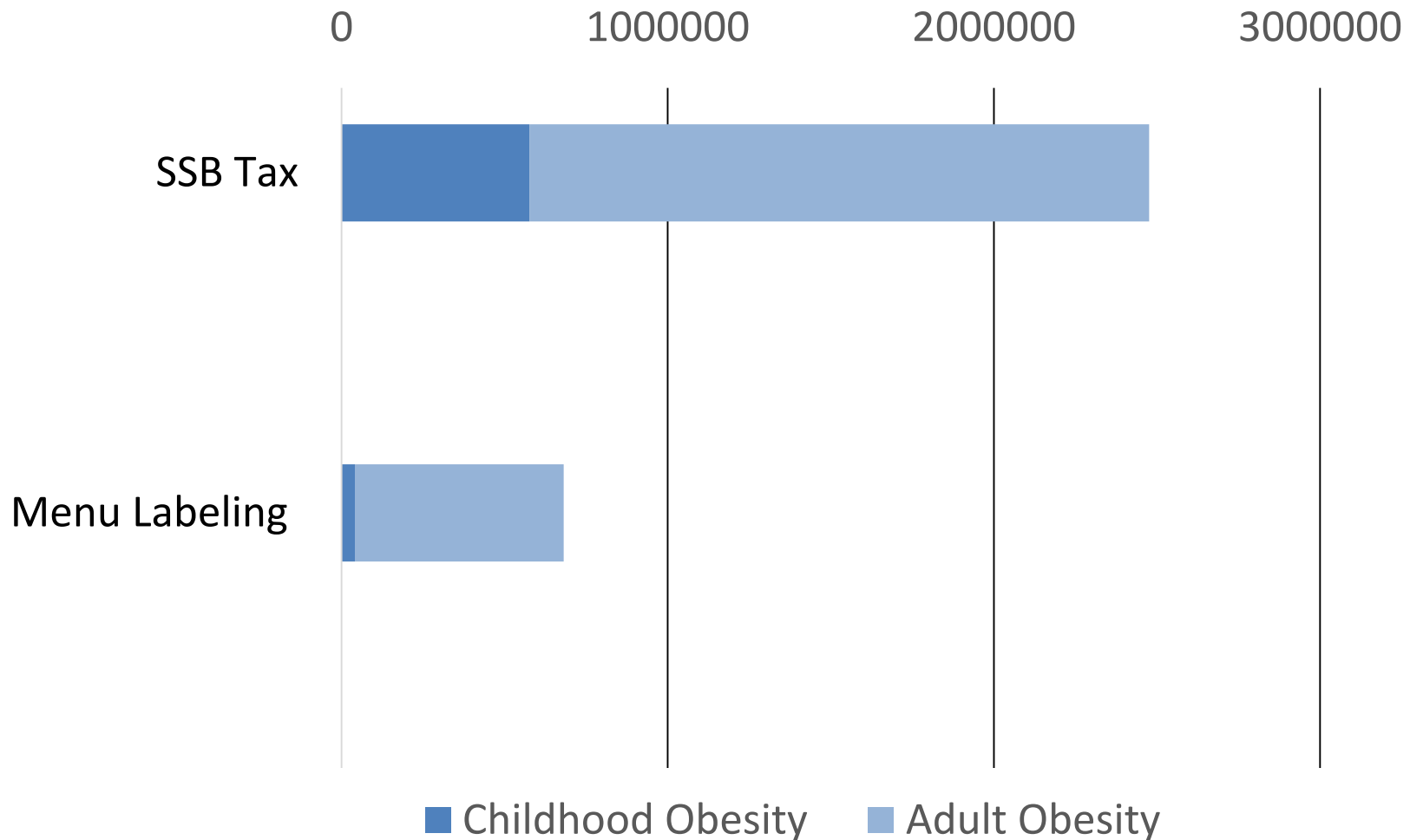
- We cannot expect to treat our way out of the obesity epidemic:
  - **Treatment** of childhood obesity makes a relatively small impact on obesity prevalence – too little too late
  - **Preventive strategies** are critically important for addressing the epidemic



# Multiple Strategies Needed

- No one prevention strategy will solve the childhood obesity epidemic
- We must implement multiple strategies in multiple settings
- If you want immediate health care cost savings, you need to implement interventions that impact both adults and children

# Cases of Childhood and Adult Obesity Prevented



# Additional Outcome

- The SSB Tax intervention would produce an estimated \$12.5 (2015) billion/year in tax revenue.
- The elimination of the tax subsidy for marketing junk food and beverages to children would produce an estimated \$80 (2015) million/year in tax revenue.





# Impact on Disparities

- We need to be mindful of the existing inequities that impact access to interventions and/or to opportunities for physical activity and healthy diets
  - Some interventions can help to address disparities

# Conclusions

- Policy makers must invest in prevention to reduce childhood obesity
- Interventions early in the life course have the best chance of reducing long-term obesity prevalence and related mortality and health care costs

**Source:** <sup>1</sup>Gortmaker SL, Wang YC, Long MW, Giles CM, Ward ZJ, Barrett JL, Kenney EL, Sonnevile KR, Afzal AS, Resch SC, Cradock AL. Three Interventions That Reduce Childhood Obesity Are Projected to Save More Than They Cost to Implement. *Health Affairs*, 34, no. 11 (2015):1304-1311.

# Learn More

## Contact CHOICES

617-384-8545

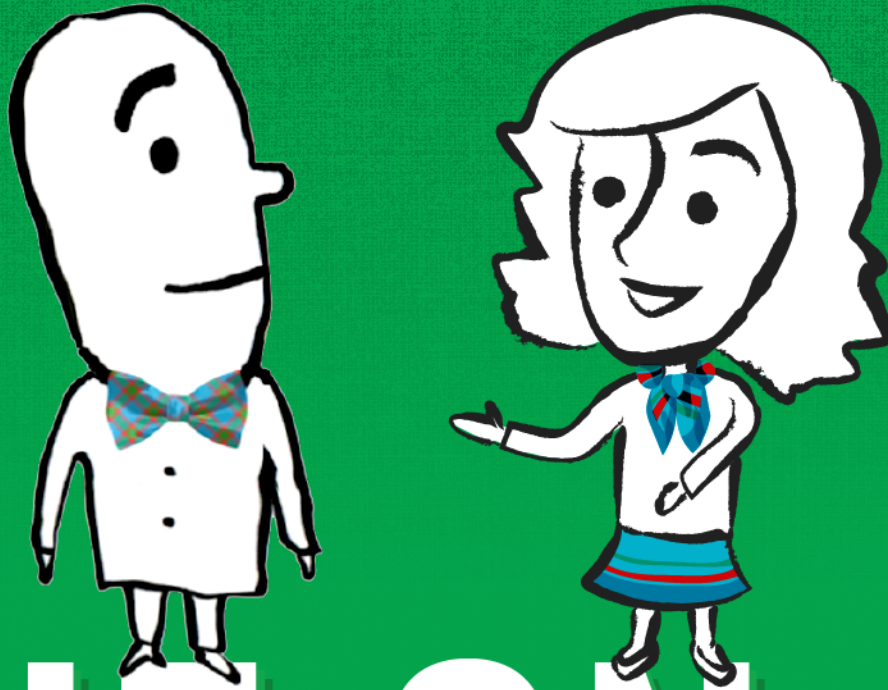
[cgiles@hsph.harvard.edu](mailto:cgiles@hsph.harvard.edu)

## Visit CHOICES

[www.ChoicesProject.org](http://www.ChoicesProject.org)

@CHOICESproject

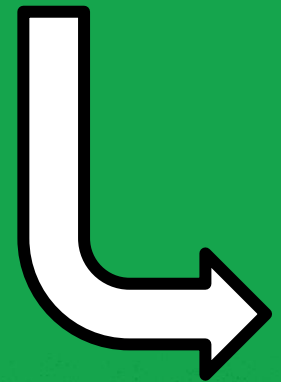
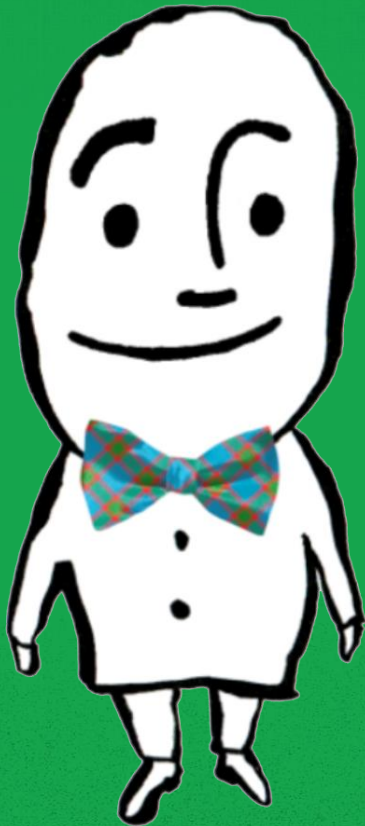




ONE ON ONE

# Questions?

Please type your question(s) in the chat box located on the right.



# One on One

**Question:**

**What types of interventions will the project study in the future?**



# One on One

**Question:**

**What are the benefits and disadvantages of modeling these interventions separately versus cumulatively?**

# One on One

**Question:**

**Are there any other measures of impact or cost-effectiveness that you plan to include in future studies?**

# One on One

**Questions from the Audience**



# What's Next?



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# What's Ahead for NCCOR in 2016

- **Healthy Communities Study**

- **Purpose:** Examining 130 demographically diverse communities and an estimated 5,000 children and their parents to explore promising programs and policies designed to address local childhood obesity rates.
- **Results available in 2016!**

- **Childhood Obesity Declines Project**

- **Purpose:** Exploring communities' perceptions of potential drivers of reported declines in childhood obesity, particularly those that influenced disparities. Communities include Anchorage, AK; New York, NY; Granville County, NC; and Philadelphia, PA.
- **Results expected in 2016!**

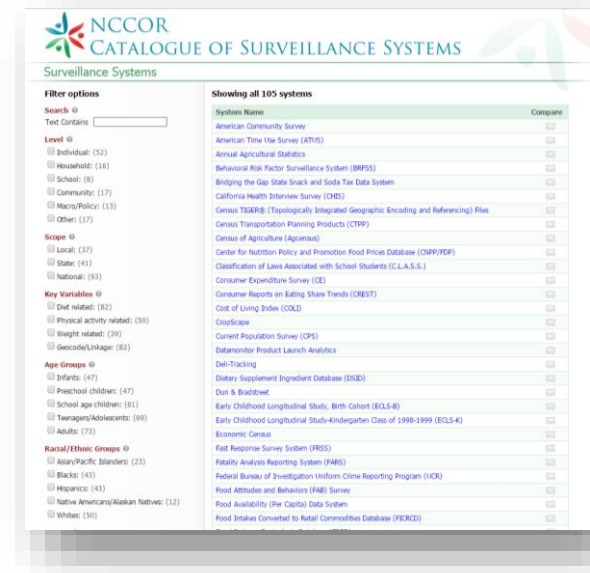
# Call for Papers: Youth Energy Expenditure

- NCCOR's Youth Energy Expenditure workgroup is developing a Youth Compendium of Physical Activities, a comprehensive and standardized list of the measured energy cost of youth activities.
- NCCOR invites investigators to contribute original research articles that will directly inform the development of the Youth Compendium of Physical Activities.
- Articles will be published in a special, open-access supplemental issue of the *Journal of Physical Activity and Health* in 2016.
- Deadline: Dec. 21, 2015.
- More information: <http://nccor.org/blog/advancing-research-on-youth-energy-expenditure-call-for-article-submissions/>



# NCCOR's Catalogue of Surveillance Systems

- NCCOR's Catalogue of Surveillance Systems provides more than 100 publicly available data sources relevant to childhood obesity research
- NCCOR is currently seeking recommendations for additional datasets to include in the Catalogue
- To submit your suggestions, visit [www.nccor.org/nccor-tools/catalogue/feedback](http://www.nccor.org/nccor-tools/catalogue/feedback)



# Further Questions?

For questions about NCCOR or upcoming activities email the NCCOR Coordinating Center at [nccor@fhi360.org](mailto:nccor@fhi360.org)





**NCCOR RESOURCES**

- NCCOR Communications
- Infographics
- NCCOR Videos
- NCCOR Webinars**

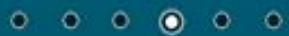
**RESOURCES FROM MEMBERS**

- Interventions
- Surveillance
- Research and Evaluation
- Leadership
- Non-Health Partners
- Other Resources

**NCCOR Overview Booklet**  
Learn about the National Collaborative on Childhood Obesity Research and its activities.



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READ ABOUT OUR UPCOMING FUNDING OPPORTUNITIES







Thank you!