

Multi-level strategies to prevent overweight and obesity: A systems approach

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- National Institutes of Health: *multiple grants*
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- Robert Wood Johnson Foundation
- JPB Foundation
- New Balance Foundation
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- Newman's Own Foundation
- New Balance Chair in Childhood Nutrition

Additional Funding (within past 5 years)

- Harvard Pilgrim Healthcare Foundation
- American Heart Association

Discover

Generate the
evidence

Develop
strategies to
put evidence
into action

Impact

Innovate

Scale

Apply novel
approaches
for national
reach

Creating Social Change within Communities

- Decades of research has informed the current generation of thinking
- Obesity-related behaviors are not only a matter of individual choice but strongly influenced by multiple levels of socio-environmental systems interacting simultaneously
- Community, environmental, and policy-based interventions are creating a paradigm shift and paving the way for future approaches to reverse the epidemic and create social change
- This shift will require an interdisciplinary knowledge base integrating systems theory with concepts and practice from community development, social ecology, social networks, public health , and more

Defining "community"

- Within the community health arena, debates often center on whether it is best to define communities as:
 - "communities of place" - defined as those who live and/or work in geographically bounded spaces or
 - "communities of identity" - defined in terms of people who share a common social identity such as religious communities (Campbell & Murray, 2004)

Community Assets

Table 1. Community Assets

<p><u>Leaders and Champions:</u> recognized, <i>official or unofficial</i>, individuals who have the capacity to influence others and/or progress change.</p> <p><u>Expertise:</u> local, historical, and functional knowledge and problem solving skills and the capacity to acquire and develop each.</p> <p><u>Networks:</u> existing and/or potential opportunity and ability for community members to connect, organize, and share resources.</p>	<p><u>Culture:</u> social norms, traditions, values, and beliefs (can be common or disparate)</p> <p><u>Resilience:</u> determination, persistence, and adaptation of community members in the face of change and challenges.</p>	<p><u>Settings:</u> worksites, places of worship, schools, businesses</p> <p><u>Systems:</u> political, healthcare, childcare, services and safety nets</p> <p><u>Environment</u> - Unindustrialized and recreational land availability and use and community infrastructure</p>
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Community assets are resources in the community that either exist or can be cultivated toward initiating and sustaining change within a community.

Best practices of successful community-engaged interventions



Shape Up Somerville: Eat Smart. Play Hard.



- **A community-based, participatory, environmental approach to prevent childhood obesity (2002-2005)**
- **A 3 year controlled trial to study 1st – 3rd grade culturally and ethnically diverse children and their parents from 3 cities outside Boston**
- **Goals:**
 - **To examine the effectiveness of the model on the prevention of undesirable weight gain in children**
 - **Transform a community and inform social change at the national level**

R06/CCR121519-01 from the Centers for Disease Control and Prevention.

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Shape Up Somerville:
Eat Smart. Play Hard.

Multi-level, Multi-Sector, Multi-System

- Home
- Schools
- Restaurants
- Government
- Health care
- Media

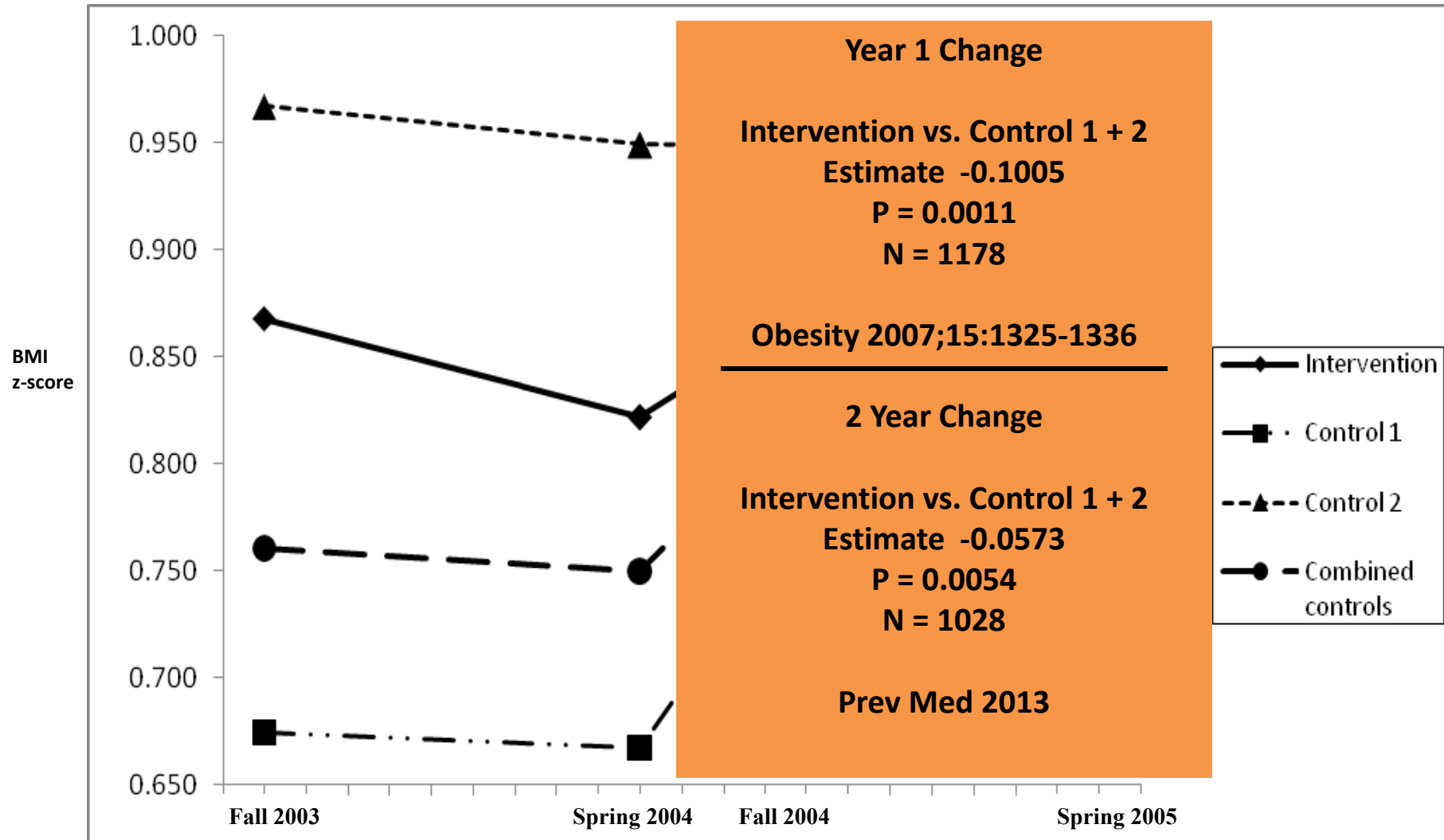


3 year intervention

- ↓ BMI-z score
- ↓ Obesity prevalence
- ↓ Sugary drink intake
- ↑ Number of sports & activities/yr
- ↓ Screen time
- ↑ Communitywide policy change

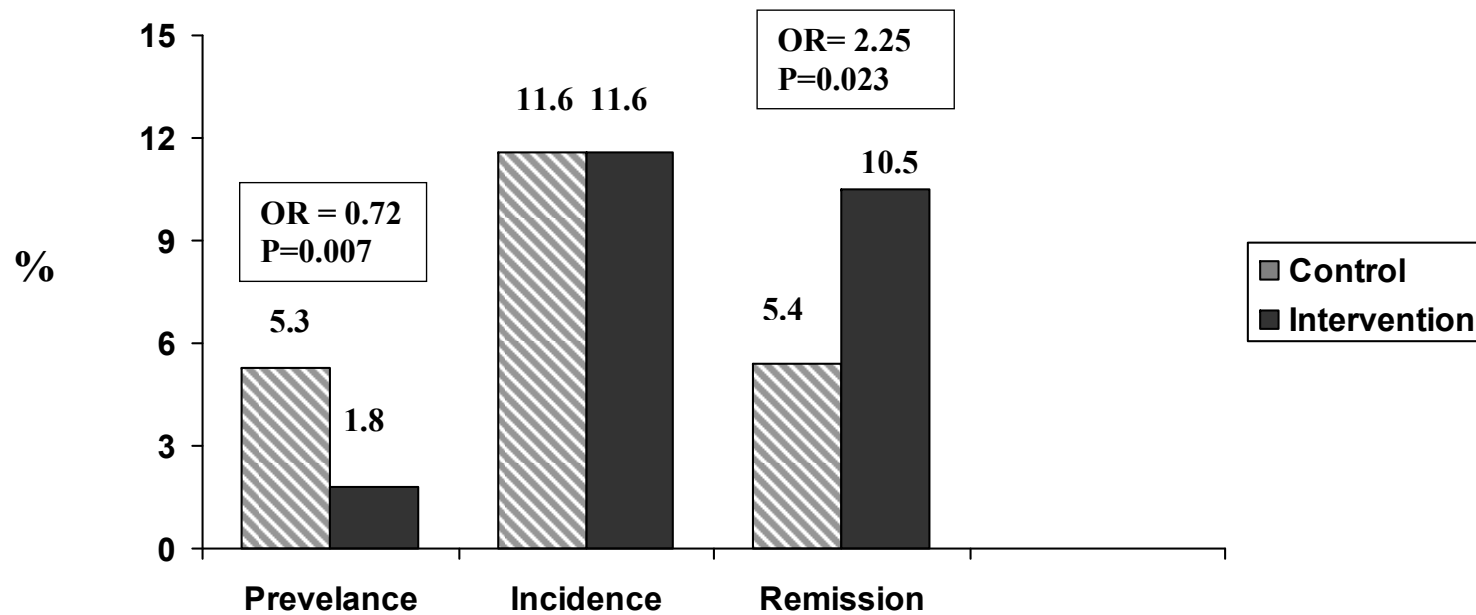
National model for change

RESULTS: BMI z-score at 4 time points



N = 922

Overweight and Obesity Over Two School Years



(N=1034)

RESULTS: 2 Year behavior Change

Table 2-Adjusted differences in behaviors between intervention and combined control communities after 2-year intervention period

Behavior	Baseline				After Intervention				Pre-Post Change: Adjusted Difference ¹		Model Properties	
	Control Group		Intervention Group		Control Group		Intervention Group		Effect (95% CI)	p-value	additional covariates	R ²
	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)				
Fruit & vegetable (servings/day)	317	3.1 (1.5)	103	3.5 (1.6)	317	3.4 (1.6)	103	3.7 (1.8)	0.16 (-0.06,0.38)	0.09	parental foreign born status, # siblings	0.18
Sugar-sweetened beverages (ounces/day)	265	6.5 (6.0)	72	6.1 (6.3)	265	7.6 (7.0)	72	5.5 (6.7)	-2.00 (-3.76,-.25)	0.04	# rules	0.21
Sports (# per year)	343	2.9 (2.8)	111	3.6 (2.9)	343	3.4 (2.7)	111	4.0 (2.9)	0.20 (0.06,0.33)	0.02		0.21
Walk to/from school (# trips per week)	248	2.7 (4.0)	87	3.5 (4.1)	248	2.6 (3.9)	87	3.9 (4.2)	0.65 (-0.53,1.82)	0.14	parent marital status, maternal BMI	0.20
TV time (hrs/day)	325	2.2 (1.1)	104	1.6 (1.1)	325	2.2 (1.0)	104	1.7 (1.2)	-0.24 (-0.51,0.04)	0.06	# rules	0.27
Total screen time (hrs/day)	332	3.8 (1.8)	106	2.7 (1.6)	332	3.9 (1.9)	106	3.0 (2.2)	-0.24 (0.42,0.06)	0.03	parent marital status, # siblings, # rules	0.22
TV in bedroom ² (% yes)	250	50.4%	85	29.4%	250	54.8%	85	31.8%	0.39 (0.11,0.89)	0.13	child weight category, # siblings, maternal BMI	-- ⁴
Dinner with TV ³ (% not very much/never)	337	61.4%	110	73.6%	337	62.0%	110	71.8%	OR 0.94 (0.88, 1.00)	0.06		-- ⁴

Folta S, Kuder J, Goldberg J, Hyatt R, Must A, Naumova E, Nelson M, Economos C. Changes in diet and physical activity resulting from the shape up Somerville community intervention BMC Pediatrics.2013, 13:157.

Reducing parent BMIs through a child-targeted, community-based environmental change intervention

Treatment effect of Shape Up Somerville on parent body mass index (BMI)¹

Change in parent BMI

Treatment effect

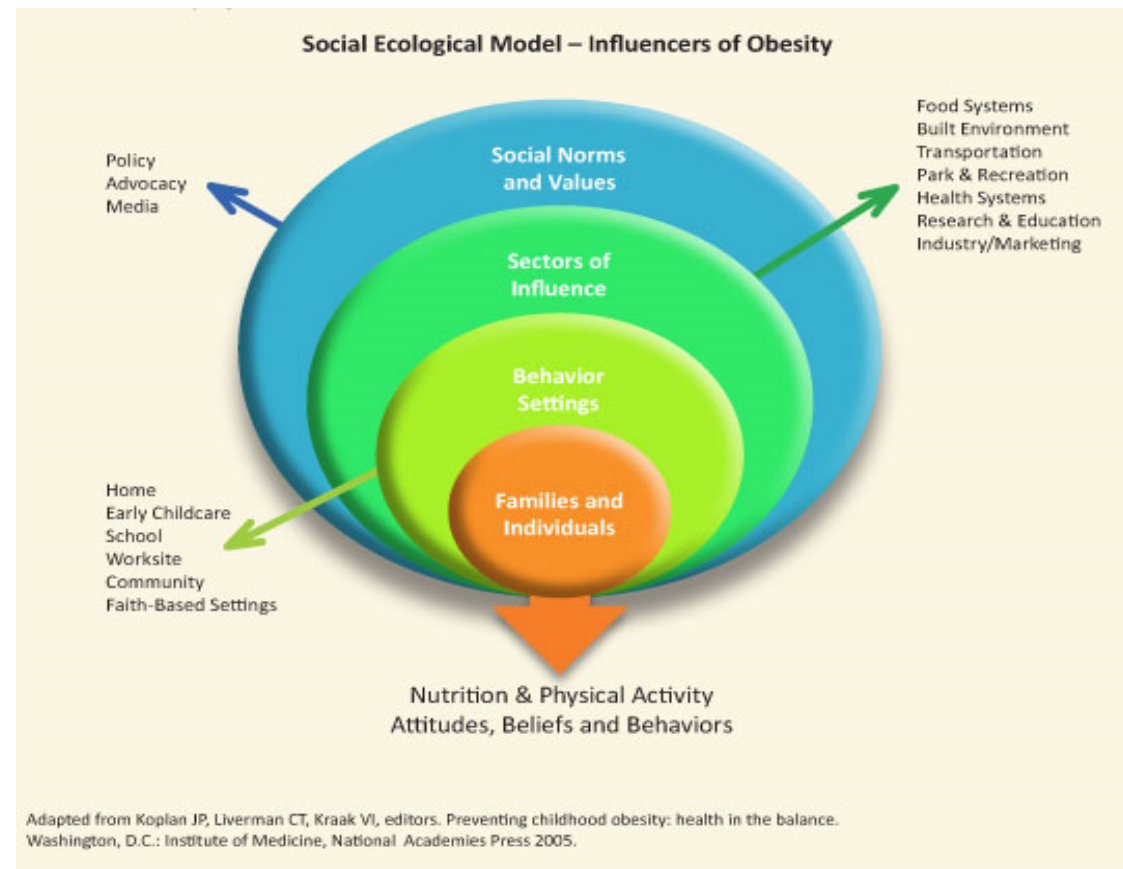
-0.433

95% confidence interval

-0.765, -0.101

Notes: The sample Included all parents with BMI calculations and covariate information at the pre- and post-intervention stages whose children also had pre- and post-intervention BMI z-scores. The results were estimated with an inverse probability weighting estimator adjusted for clustering. The dependent variable was the change in parents' pre- and post-intervention BMI. The variable of interest (treatment effect) was a binary independent variable indicating treatment status—whether an observation was exposed or not exposed to SUS. Beyond treatment status, covariates included pre-intervention BMI, marital status (married or not married), respondent's age group (18-24; 25-29; 30-39; 40-49; 50-59; 60 and older), sex (female or male), education (did or did not attend/graduate college), nativity (was or was not born in the United States), primary household language (English or other language), and child's race (white or non-white).

Using a Systems-Oriented Approach to Community-based Obesity Prevention



Using a Systems-Oriented Approach

- Developing the first step in
- A systems approach interdependent individuals
- The complexity of the system is comprehended
- Highlights the event occurring in the implementation
- Maps out the change and

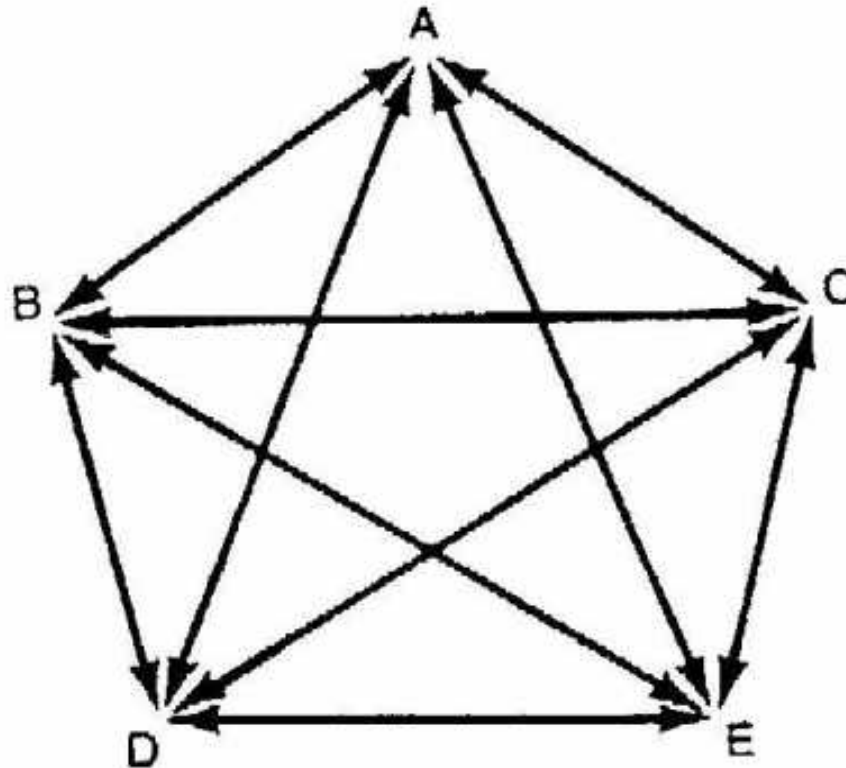


FIGURE 1-4. Systems thinking.

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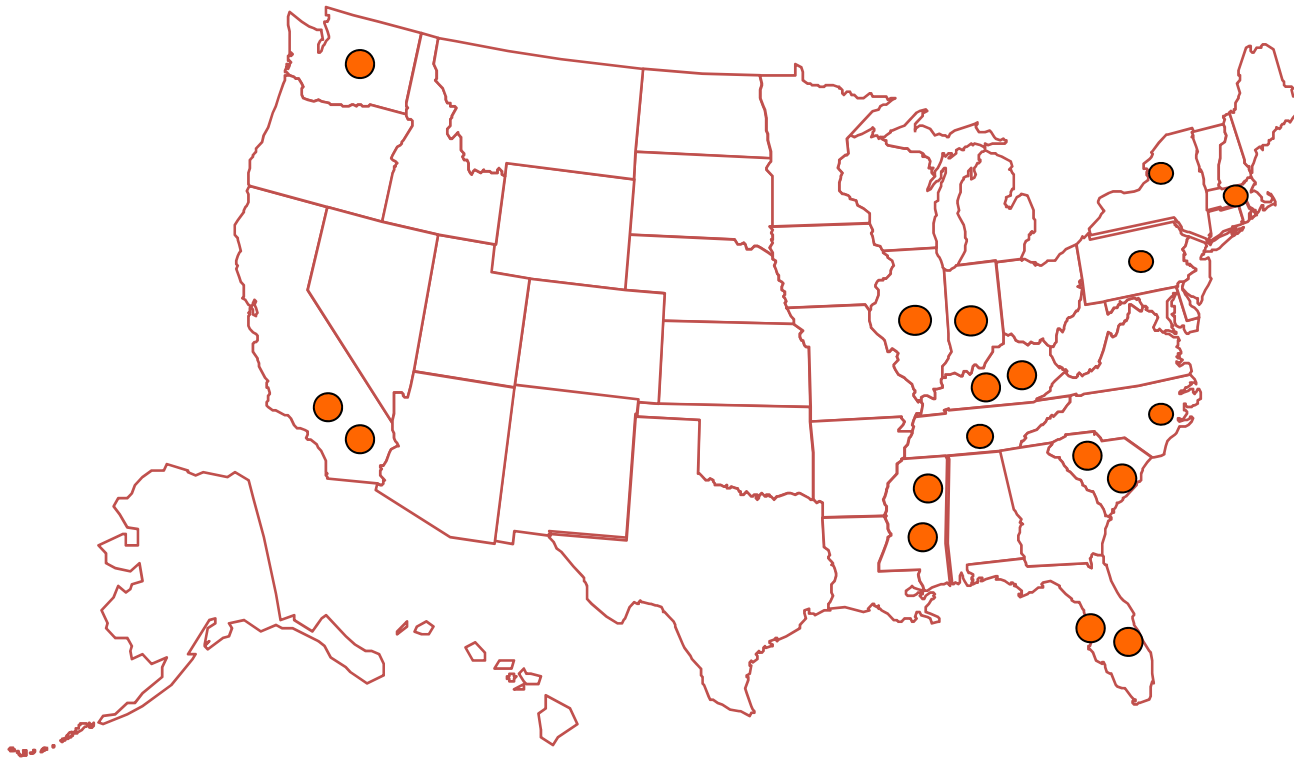
The Dynamics of Community Change: The Shape Up Somerville Experience

- To describe the key aspects and dynamics of social change within the community of Somerville over 10 years
- Retrospective examination of the SUS model using a systems perspective in an effort to create a framework that may help guide future community-based childhood obesity prevention interventions
 - qualitative systems analysis informed by individual and group interviews with key SUS stakeholders and researchers
- To illustrate through the integration of the socio-ecological model (determinants) and community-based participatory research methods (approach) by visualizing the process using a systems perspective (process).

18 communities

200,000 children

0.25 % of kids



Required elements to Advance Community-based Research Approaches

- A systems perspective
- Multi-level, -component, -sector approaches
- Enhanced design and analysis approaches
- New and improved tools and methodologies
- Improved community engagement models
- Development of sustainability frameworks
- Economic analysis components



child obesity180
reverse the trend.

Empower

Unite

Accelerate



Friedman School of
Nutrition Science and Policy

Our Unique Approach

child obesity180
reverse the trend.

Impact

Reach 80%
of children
ages 5-12
nationwide

Rigor of
Science

Innovation
of Business

Strategies

1. **Drive impact** by combining the rigor of science with the innovation of business through a portfolio of strategic initiatives, engaging leaders, and evaluating impact.

Portfolio of initiatives	Charter members
Impact evaluation	Reaching children at greatest risk

2. **Amplify impact** through cooperative work with key partners.
3. **Sustain impact** for long-term societal change.

Scaling Up for National Reach & Impact: 22 Million Children by 2018



the breakfast effect



The Restaurant Initiative



ChildObesity180 is taking a leadership role in reducing children's excess calorie consumption in restaurants, through:

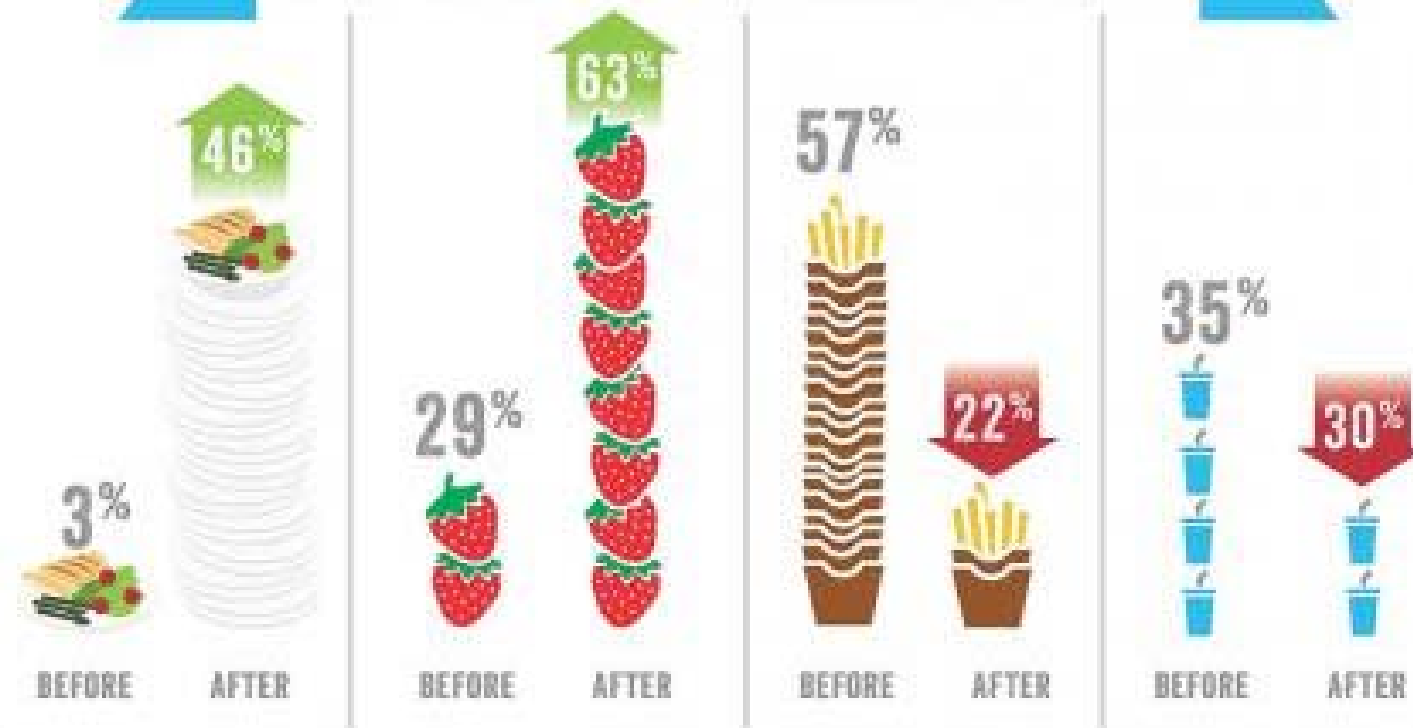
- Strong industry engagement & consumer understanding;
- Generation & dissemination of original research; and
- Established credibility among public health advocates & academics

childobesity180

Case Study of Healthy Menu Changes

WHAT HAPPENED?

KIDS ORDERED HEALTHIER MEALS



AND THE RESTAURANT'S REVENUE
CONTINUED TO GROW

Case Study of Healthy Menu Changes

And the restaurant's annual revenue continued to grow – 5.3% - and exceeded that of similar family dining chains during the same time period (2013-2014)

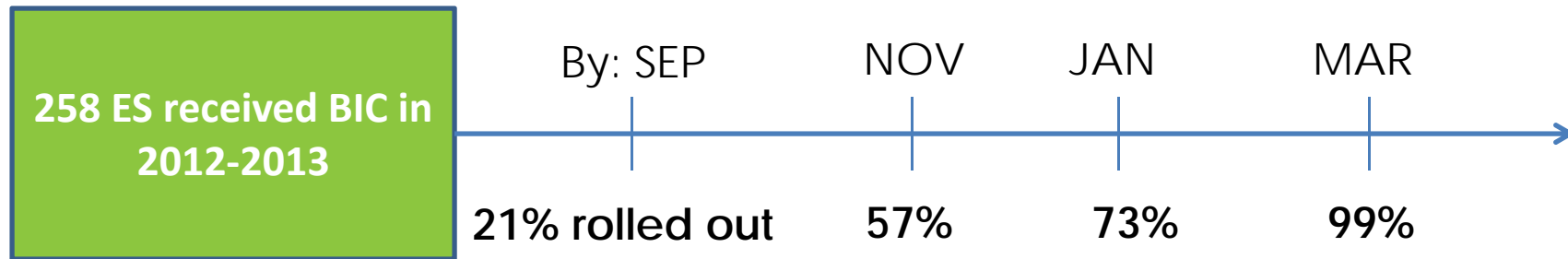
	Before menu	Shortly after menu	Follow up 1 (one	Follow up 2 (two
Soda ordered	34.7%	29.7%	25.3%	24.1%

Anzman-Frasca, S., Mueller, M.P., Sliwa, S., Dolan, P.R., Harellick, L., Roberts, S.B., Washburn K., Economos, C.D. Changes in children's meal orders following healthy menu modifications at a regional US restaurant chain. *Obesity*. 2015 May;23(5):1055-62

Anzman-Frasca S, Mueller MP, Lynskey VM, Harellick L, Economos CD. Sustainability of changes in children's meal orders following healthy menu modifications at a regional US restaurant chain: Two year follow-up. *Health Affairs Nov 2015 vol. 34 no. 11 1885-1892*

Ongoing rollout of BIC in a large, urban US school district

- Among district elementary schools:

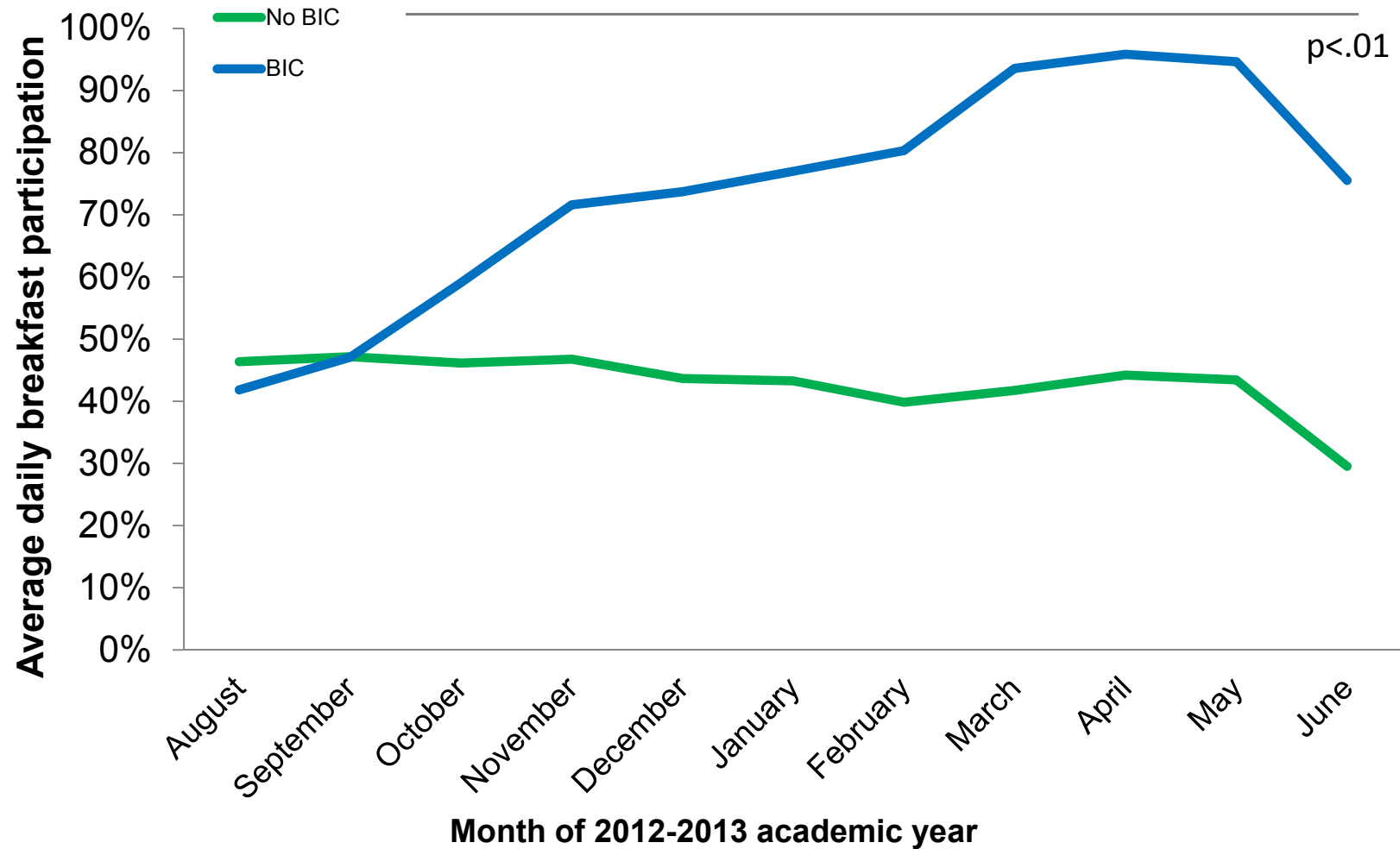


Rolled out over time

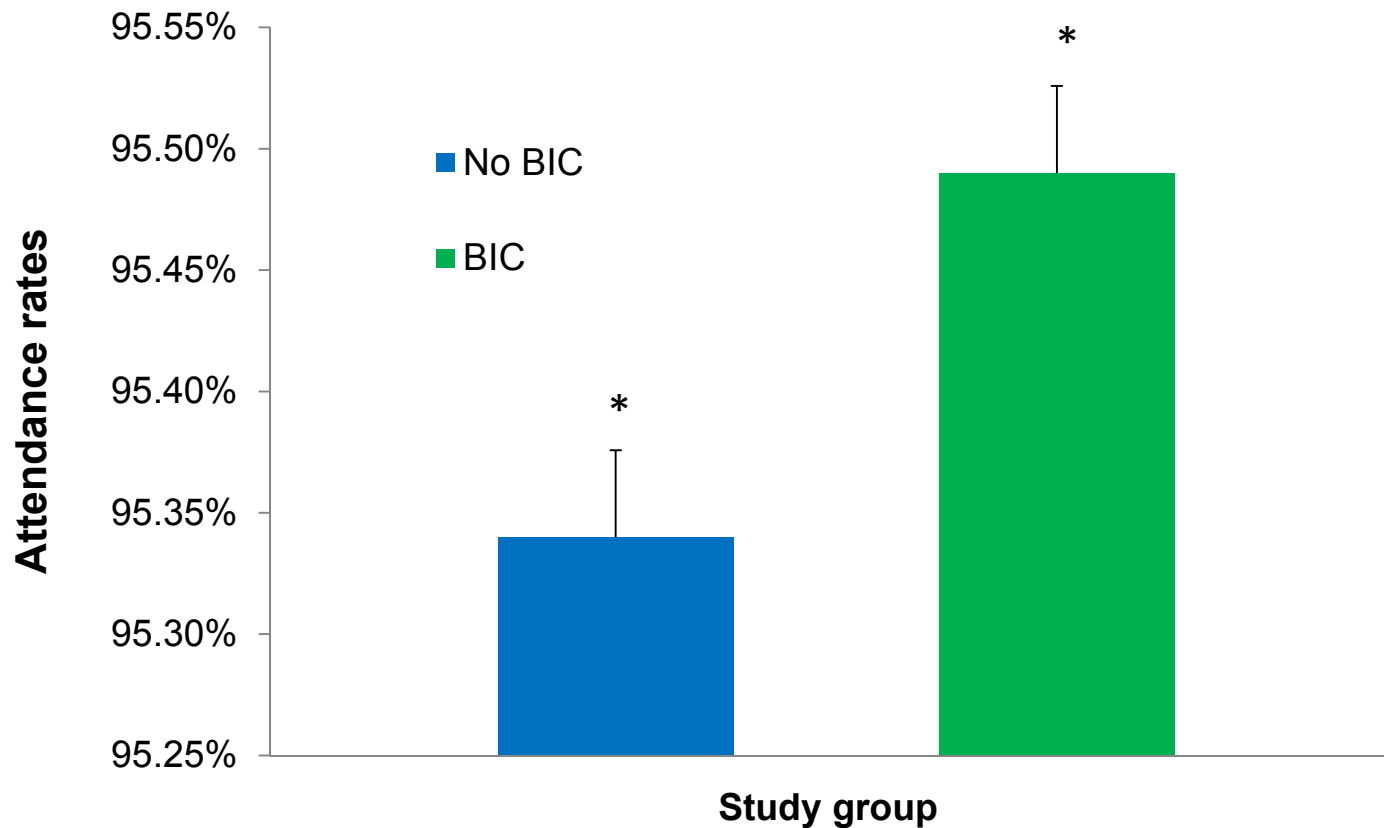
**241 ES did not have
BIC in
2012-2013**

Will implement in later years

SBP participation increased across the year in BIC schools



Overall attendance was higher in BIC schools



- * $p < .05$



Introduction to the Breakfast Effect Video Series



How does school breakfast affect academic achievement?



How does school breakfast impact children's nutrition?



How does school breakfast affect children's health?



Is "Universal Free Breakfast" the way to go?



Should school breakfast be served in the classroom?



Promote school breakfast in your district!



Call to Action for Researchers and Funders of Research

Active Schools Acceleration Project: Approach

Phases

- Identify
- Replicate
- Scale
- Sustain



Active Schools Acceleration Project

Phase 1: IDENTIFY & INNOVATE

500
PROGRAMS



9

WINNERS

4,000
SCHOOLS ENGAGED

10,000
CHAMPIONS

Phase 2: REPLICATE

1,000

SCHOOLS IN ALL 50 STATES



100 MILE CLUB
EMERGES AS
LEADER

Phase 3: SCALE

MEDIUM-TERM GOAL

10,000

SCHOOLS IN THE BILLION MILE RACE



LONG-TERM GOAL

25,000

SCHOOLS REACHED
EQUATES TO 31% OF US SCHOOLS (K-6)

childobesity180

#BillionMileRace

SHARE



LOGIN

ACTIVATE YOUR SCHOOL



new balance
FOUNDATION

BILLION MILE RACE

TUFTS UNIVERSITY FRIEDMAN SCHOOL

HOW IT WORKS

WHO'S IN?

WHY?

GRANTS

100 MILE CLUB

017,160,740
MILES



4,162
SCHOOLS



939,165
STUDENTS

Walk, Skip, Run.
YOU'RE INVITED, RACE WITH US.



- <https://www.youtube.com/watch?v=ypTXdTz-hJ4>

Healthy Kids Out of School - HKOS

Process

**UNIFY
CREATE
COMMIT**

Outcomes



Drink Right: Choose Water Over Sugary Beverages



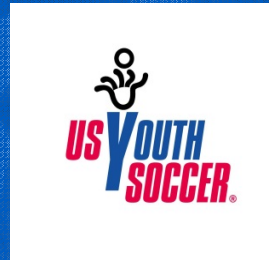
Move More: Boost Movement & Physical Activity



Snack Smart: Fuel Up on Fruits & Vegetables

Sliwa S, Newman M, Nelson M, Sharma S, **Economos CD**. Healthy Kids Out of School: Utilizing mixed-methods to develop guiding principles for promoting healthy eating and physical activity across diverse out-of-school settings in the United States. *Prev Chronic Dis*. 2014 Dec 31;11:E227.

Healthy Kids Out of School - HKOS



Folta S, Koomas A, Meteyar N, Fullerton K, Hubbard K, Anzman-Frasca S, Hofer T, Newman M, Nelson M, Sacheck J, Economos CD. Engaging Stakeholders from Volunteer-Led Out-of-School Time Programs in the Dissemination of Guiding Principles for Healthy Snacking and Physical Activity. Preventing Chronic Disease [in press].

What's Next?



- Scale Up for Maximum Impact
- Collaborate and Align with National Peers
- Sustainability Plan
- Increase Private Sector Action
- Close Disparity Gap
- Cultivate Healthy Values



What's Next?



Reach 80%

of children ages 5-12
nationwide

