Catalyzing Communities to Reduce Obesity

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U.S. Childhood Obesity National Trends

Ecological Systems Model
All systems that influence human behavior must contribute and change to influence future obesity rates

Global Level
Macro level
Mezzo level

Agricultural policies

Educational priorities

Health care coverage

Educational priorities
Global Level
Macro level
Mezzo level

Ecological Systems Model
All systems that influence human behavior must contribute and change to influence future obesity rates

Agricultural policies
Educational priorities
Health care coverage
Advertising & gaming

Food insecurity

Urbanization
Built environment

Oil crisis

Global Food Prices

Global Level
Macro level
Mezzo level

Agricultural policies
Educational priorities
Health care coverage
Advertising & gaming

Food insecurity

Urbanization
Built environment

Oil crisis
All systems that influence human behavior must contribute and change to influence future obesity rates.
BACKGROUND

- Proactive strategies required to prevent childhood obesity
- Individual behaviors must be addressed in the context of societal and environmental influences
- Most prevention studies target school environments
- Learn from other movements (tobacco, recycling, seat belts, breastfeeding) to spark social change
- Community-based interventions that have a theoretical framework and are multi-level and participatory in nature are needed: SUS, Be Active Eat Well, EPODE
  - Huang TT and Glass TA. Transforming research strategies for understanding and preventing obesity. JAMA. 2008 Oct 15;300(15):1811-3

What can we do?

Work in Communities

There's strength in numbers!

Shape Up Somerville: Eat Smart. Play Hard.

- A community-based, participatory, environmental approach to prevent childhood obesity
- 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

CBPR

- Community-based participatory research (CBPR) includes a collaborative partnership with the community in all phases of the research:
  - identifying the problem
  - designing, implementing and evaluating the intervention
  - building community capacity
  - identifying how data informs actions to improve health within the community

Potential to influence cultural and social norms

Study Subject Numbers

<table>
<thead>
<tr>
<th>Eligible students</th>
<th>N=5940</th>
</tr>
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<tbody>
<tr>
<td>Consented to participate</td>
<td>N=1721</td>
</tr>
<tr>
<td>Pre/Post Year 1 (Oct 03-May 04)</td>
<td>N=1178</td>
</tr>
<tr>
<td>Pre/Post Year 2 (Oct 04-May 05)</td>
<td>N=1100</td>
</tr>
<tr>
<td>Pre/Post Years 1 &amp; 2 (Oct 03-May 05)</td>
<td>N=1034</td>
</tr>
</tbody>
</table>

Study Timeline

- Baseline Pre School Year 1 Measurement Oct 03
- Pre School Year 1 Measurement Sept 04
- Post School Year 1 Measurement May 04
- Summer
- Year 1 Intervention Oct 03-Sept 04
- Year 2 Intervention Oct 04-Sept 05

Additional support: Blue Cross Blue Shield of Massachusetts, United Way of Mass Bay, The US Potato Board, Stonyfield Farm, and Dole Foods.

Source: Institute of Medicine, Preventing Childhood Obesity, Health in the Balance, 2005.
Experiential Learning

Baseline Overweight/Obesity

INTERVENTION

- Designed to increase energy expenditure (EE) of up to 125 kcals per day beyond the increases in EE and energy intake that accompany growth
  - Variety of increased opportunities for physical activity
  - <2 hr. per day of Screen Time, No TV in bedroom
  - Increased availability of foods of lower energy density emphasizing fruits, vegetables, whole grains, and low-fat dairy
  - Foods high in fat and sugar were discouraged
  - Family Meals encouraged – structure, modeling, education, emotional connection: practice as often as possible
- Multi-level approach:
  - Before, during, after school, home, community

Skills Development
Demonstrations

A La Carte Options: Before Shape Up….

After…Improved A La Carte Options

HEAT Club: After School Program

Before school: Walking School Bus

Support from Community Champions

Visible role models
- Mayor Joe Curtatone
- Aldermen
- School Committee Members
Growing food, knowing food
School Gardens and Nutrition Education

Shape Up Somerville: Results

• Engaged 90 teachers in 100% of 1-3 grade classrooms (N=81)
• Participated in or conducted 100 community events and 4 parent forums
• Trained 50 medical professionals
• Recruited 21 restaurants
• Reached 811 families through 9 parent newsletters, and 353 community partners through 6 community newsletters
• Reached over 20,000 through a monthly media piece (11 months)
• Recruited all 14 after-school programs
• Developed community-wide policies to promote and sustain change

City Wide Policy Changes

• School Department
• Food Service Department
• Classroom Curriculum
• Walkability
• Research
• City Employee Wellness

RESULTS: BMI z-score at 4 time points

N = 922

RESULTS: BMI z-score at 4 time points

N = 922
RESULTS: BMI z-score at 4 time points

![Graph showing BMI z-score changes over time with control and intervention groups.](image)

N = 922

First Year Results

<table>
<thead>
<tr>
<th>Time Point</th>
<th>Estimation</th>
<th>P value</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1 Change</td>
<td>0.1005</td>
<td>0.0011</td>
<td>1178</td>
</tr>
</tbody>
</table>

Obesity 2007;15:1325-1336


RESULTS: Pre-Post Summer BMI z-score

![Graph showing BMI z-score changes over time with control and intervention groups.](image)

N = 1120

Overweight and Obesity Over 2 Years (N=1034)

Described data have not been published yet.

School Nutrition Policy Initiative: Results

![Graph showing incidence, remission, and prevalence of overweight (85.0th-94.9th percentiles) at 2 years.](image)

Described data have not been published yet.
Implications / Future Directions

Comprehensive strategies with changes in multiple environments reinforced with policies that ensure healthy living are a viable and necessary direction for the future.

Beyond Somerville

Replicating the intervention across the country through a RCT with 6 urban communities. The BALANCE Project

Adapting and implementing the intervention through a RCT in 8 communities in rural America (CA, MS, KY, SC) with Save the Children. The CHANGE Project

Distributing the HEAT Club after school curriculum through live and online trainings throughout the U.S. (>200 ASPs in 20 states) including a RCT

Expanding the work to target new immigrants through a new NIH grant

www.childreninbalance.org

IOM Evaluation Framework for Obesity Prevention Adapted for Shape Up Replication

<table>
<thead>
<tr>
<th>SECTORS</th>
<th>RESOURCES &amp; INPUTS</th>
<th>STRATEGIES &amp; ACTIONS</th>
<th>OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Local Government</td>
<td>Health-related</td>
<td>School</td>
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<tr>
<td></td>
<td></td>
<td>policies</td>
<td>services and policy outcomes</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>outcome</td>
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The BALANCE Project:

Goals & Objectives:

- Replicate the Shape Up Somerville (SUS) model in underserved, urban communities in the US with similar community characteristics (i.e. size, SES) and level of community readiness
- Nationwide RFP process
- Two year study – Spring 2008-Spring 2010
- Community and school-level environmental & policy outcomes

Outcome Evaluation: BALANCE

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Evaluation Tool</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Readiness</td>
<td>Community Readiness Model</td>
<td>Spring 2008, Spring 2009, Spring 2010</td>
</tr>
<tr>
<td>Built Environment/Community Policy</td>
<td>Completion of community assessment tool</td>
<td>Fall 2008, Spring 2009, Spring 2010</td>
</tr>
<tr>
<td>Wellness Policy</td>
<td>Quality of policy language, extent of implementation</td>
<td>Wellness Policy Checklist/Survey Tool, Interview with school principals</td>
</tr>
</tbody>
</table>
Background: Rural America

- Difficult to define
- Chronic, entrenched poverty
- Declining job opportunities and population loss
- Low education and literacy
- Racism
- Less developed transportation infrastructure
- Lack of access to services and amenities
- Safety concerns
- Isolation and Stigma

The CHANGE Study
Creating Healthy, Active, and Nurturing Growing-up Environments

- Adapt and implement elements from the Shape Up Somerville model
- Test for effectiveness in a rural setting through a RCT with an ASP comparison
- 2100 1st-6th grade children in four rural regions of the US
  - 32 randomly selected after school programs CHANGE I
  - 8 new schools/communities CHANGE II
- Individual, family, community and school-level environmental & policy outcomes
- Long term goal: to disseminate childhood obesity research that will empower individuals and communities to catalyze change in rural environments
CHANGE Research Study Design

Randomly Selected After-School Programs

Group 1
"CHANGE I"
After school programs (22) receive Component I only

Group 2
“Intervention group/CHANGE II”
New schools (4) receive Component II only

Total sample (N = 2,100 children)

CHANGE Study Sites

Outcome Evaluation: CHANGE

Measurable end results that will allow comparison between the intervention and control communities (n=8) in order to identify a program’s impact.

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<th>Outcome</th>
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<th>Timeline</th>
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<tr>
<td>Family Level</td>
<td>Family Survey</td>
<td>Winter 2008, Spring 2009</td>
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<tr>
<td>Community Readiness</td>
<td>Community Readiness Model</td>
<td>Winter 2008, Spring 2009</td>
</tr>
<tr>
<td>Wellness Policy</td>
<td>Quality of policy/laws, number of implementation actions, Policies for evaluating existing policies.</td>
<td>Winter 2008, Spring 2009</td>
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</table>

Weight Status

Described data have not been published yet.

Dietary Intake: Total Calories

Described data have not been published yet.

Dietary Intake: Food Groups

Described data have not been published yet.
Dietary Intake: Fat

Described data have not been published yet.

Assessing and Preventing Obesity in New Immigrants

Goal: To create household and individual level change within a new immigrant population to alter and prevent behaviors associated with obesity and to prevent weight gain among this population.

Mother-Child dyads (N=435 dyads, 870 subjects)
- Mothers aged 20-55 years, not pregnant; Child aged 5-12
- Haitian, Latino, or Brazilian origin
- 2 year intervention
  - Lifestyle coaching sessions that address knowledge, self-efficacy, existing behaviors, behavioral skills, and intentions to act
  - Check in calls to provide motivation and schedule appointments
  - Group sessions

Disruption in Energy Balance

- Energy Expenditure
- Energy Intake

Stressors
- Financial constraints
- Lack of transportation
- Discrimination
- Language barrier
- Violence
- Fear
- Unemployment

Isolation
- Lack of transportation
- Language barrier
- Fuss
- Unemployment

Obesogenic Environment
- Access to healthy food
- Opportunities to exercise
- Fast food consumption

Weight Gain

Obesity

New Directions

Community-based interventions that have a theoretical framework and are multi-level and participatory in nature allow for inherent community assets and resources to be tapped and enable researchers to better pinpoint the specific needs of the community.

Advancing community-based research approaches to address childhood obesity will require:
- training of future leaders in community research methodology
- increased funding to conduct rigorous trials
- enhanced design, measurement, and analysis approaches
- development of sustainability frameworks
- economic analysis studies
- demonstration of efficacy and effectiveness

www.childreninbalance.org

Thank you