Catalyzing Communities to Reduce Obesity

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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

• Summer weight change recently shown to outpace expected gains with growth and development

• Community-based interventions that have a theoretical framework and are mutli-level and participatory in nature are needed
U.S. Childhood Obesity National Trends

*↑ Double, Quadrupled, Tripled*

1963-1970 NHES
1971-1974 NHANES I
1976-1980 NHANES II
1988-1994 NHANES III
1999-2004 NHANES
2003-2006 NHANES
Figure 1 Ecological model of predictors of childhood overweight. *Child risk factors (shown in upper case lettering) refer to child behaviours associated with the development of overweight. Characteristics of the child (shown in italic lettering) interact with child risk factors and contextual factors to influence the development of overweight (i.e. moderator variables). This review is organized around child risk factors and the influence of child family, and community characteristics is discussed for each child risk factor.
**Ecological Systems Model**

All systems that influence human behavior must contribute and change to influence future obesity rates.
We are ALL part of and responsible for the obesigenic environment and we must work together to reshape it.
How do you spark social change?

- Learn from other movements (tobacco, recycling, seat belts, breastfeeding)
- Call for a *Crisis*
- Build on a sound scientific base
- Nurture spark plugs
- Recognize the importance of economics
- Develop coalitions and advocacy
- Use government strategically
- Employ mass communication
- Create environmental and policy changes
- Develop a clear plan

Economos, C, Brownson, S, DeAngelis, M, Foerster, S, Tucker Foreman, C, Kumanyika, S, Pate R.
What can we do?

Work in Communities

*There’s strength in numbers!*

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

R06/CCR121519-01 from the Centers for Disease Control and Prevention.
Additional support by Blue Cross Blue Shield of Massachusetts, United Way of Mass Bay, The US Potato Board, Stonyfield Farm, and Dole Foods
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**
Community Engagement Model

**Listen…**

**Build Relationships & Establish Trust**

- Hold community meetings
- Perform environmental assessments
- Identify champions
- Employ The Social Change Model of Leadership Development
- Community council formation
- Logo and brand development
- Conduct focus groups & key informant interviews
- Capitalize on social injustices
- Identify the problem as a community priority

Model Adapted from National Resources Canada
Study Timeline

Baseline Pre School Year 1 Measurement Oct 03

Post School Year 1 Measurement May 04

Pre School Year 2 Measurement Sept 04

Post School Year 2 Measurement May 05

Summer

Planning and monitoring year Oct 02-Sept 03

Year 1 Intervention Oct 03-Sept 04

Year 2 Intervention Oct 04-Sept 05
Baseline Overweight Prevalence

At risk: ≥ 85th to < 95th percentile
Overweight: ≥ 95th percentile
Reference: CDC 2000

Ogden JAMA 2006, Economos, 2003
**Environment**
- **Early Morning Environment**
  - During School Environment
  - Afternoon Environment

**Home:**
- Parent, Child, Family
  - Fiber, ↓↓↓ Sugar, ↓↓↓ Fat
  - Appropriate Portion Sizes

- Physical Activity Equipment for Recess
  - Physical Activity (-25 kcals)

- Healthier School Lunch

- Before School Program
  - School:
    - Child, teachers, administration, staff
    - Breakfast Coordinator (-25 kcals)

- Classroom Micro Units
  - Physical Activity (-25 kcals) 5 days/wk (10 min)
  - Nutrition & Physical Activity Education 1 day/wk (30 min)

- Increased Fresh Fruits Breakfast
  - Coordinator

**School:**
- Child, teachers, administration, staff
  - Teachers
  - Administrators
  - Food Service Staff
  - PE Teachers

- Appropriate Portion Sizes

- Physical Activity (-30 kcals)

- Increased Fresh Fruits & Vegetables

- Increased Presentation and Atmosphere

- Social Marketing in Cafeteria
  - Alternative “Healthier” A La Carte Items
  - New Food Service Equipment

**Community:**
- Professional Development

- After School Programs

- Community: Ethnic groups
  - Local Government

- Health Care System
  - Media

- Community: Restaurants

- Community: Education

- Promotional Gifts
Skills Development
A La Carte Options: Before Shape Up....
After... Improved A La Carte Options

Shape-Up Snacks

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
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<tbody>
<tr>
<td>Baked Chips</td>
<td>$0.75</td>
</tr>
<tr>
<td>Pretzels</td>
<td>$0.75</td>
</tr>
<tr>
<td>Nutrigrain Bar</td>
<td>$0.75</td>
</tr>
<tr>
<td>Fruit &amp; Oat Bites</td>
<td>$0.75</td>
</tr>
<tr>
<td>Rice Cakes</td>
<td>$0.60</td>
</tr>
<tr>
<td>Pudding &amp; Jello Cups</td>
<td>$0.60</td>
</tr>
<tr>
<td>Go-Gurt Yogurt</td>
<td>$0.50</td>
</tr>
<tr>
<td>Choc Chip Granola Bar</td>
<td>$0.50</td>
</tr>
<tr>
<td>String Cheese or Fruit</td>
<td>$0.35</td>
</tr>
<tr>
<td>Teddy Grahams</td>
<td>$0.35</td>
</tr>
<tr>
<td>Water &amp; Fruit20</td>
<td>$1.00</td>
</tr>
</tbody>
</table>
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
Weight status in Children by Birth Place of Mother

### Baseline (Oct’03)

<table>
<thead>
<tr>
<th></th>
<th>Mother Born in US</th>
<th>Mother NOT born in US</th>
<th>Between Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>mean (sd)</td>
<td>t-score</td>
</tr>
<tr>
<td>BMI</td>
<td>601</td>
<td>17.7445 (3.062)</td>
<td>-2.692</td>
</tr>
<tr>
<td>BMI z</td>
<td>599</td>
<td>.699 (.953)</td>
<td>-1.378</td>
</tr>
</tbody>
</table>

### Two School Years with an Intervening Summer (Oct’03-May’05) in Controls

<table>
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<th></th>
<th>Mother Born in US</th>
<th>Mother NOT born in US</th>
<th>Between Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>mean difference (sd)</td>
<td>t-score</td>
</tr>
<tr>
<td>BMI</td>
<td>341</td>
<td>1.244 (1.43)</td>
<td>-1.998</td>
</tr>
<tr>
<td>BMI z</td>
<td>339</td>
<td>.039 (.381)</td>
<td>-1.067</td>
</tr>
</tbody>
</table>

These data indicate an increase in weight gain in children with immigrant mothers and underscore the urgent need to develop specific strategies to help this population.
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.
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 (CBPR)

www.childreninbalance.org
Stages of Community Readiness

1. No Awareness
2. Denial/Resistance
3. Vague Awareness
4. Preplanning
5. Preparation
6. Initiation
7. Stabilization
8. Confirmation/Expansion
9. High Level of Community Ownership
The BALANCE Project:

Goals & Objectives:

• Replicate the *Shape Up Somerville (SUS)* model in 6 under-served, urban communities in the US with similar community characteristics (i.e. size, SES) and level of community readiness

• 3 communities will receive the intervention; 3 will serve as control communities

• Two year study – Spring 2008-Spring 2010

• Community and school-level environmental and policy outcomes
Balance Study Sites

- Balance Study Applications (N=22)
- Balance Study Sites (N=6)
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
Typological Approach to Parenting Styles

Authoritative
Characterized by involvement, nurturance, reasoning, and structure

Indulgent
Characterized by warmth and acceptance in conjunction with lack of monitoring of child’s behavior

Authoritarian
Characterized by restrictive, punitive, rejecting, and power-assertive behaviors

Uninvolved
Characterized by little control and involvement with the child.

Graphic adapted from Hughes, SO.
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

- Approximately 2100 1st-6th grade children in four rural regions of the US

- Long term goal: to disseminate childhood obesity research that will empower individuals and communities to catalyze change in rural environments
CHANGE Study Sites

4 Intervention (1 / state)
4 Control (1 / state)

CHANGE Study Sites (N=8)
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
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
- acceptance of the study model as viable