The Battle Against Childhood Obesity: Lessons from the Front Lines

*Project Healthy Schools*

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America’s Obesity Epidemic
Our Children....

• More than 9 million youth are overweight or obese – three times more than in 1980.

• If trends continue, 80% of those will become obese adults.

• 75% get less than 20 minutes of vigorous physical activity each week.

Action for Healthy Kids
Our Children...

- If overweight, they are likely to have at least one medical complication and suffer the negative psychosocial effects like depression or isolation.

- Poor nutrition and inactivity can interfere with learning.
The Obesity Crisis and Our Children...

- Minorities are at higher risk (e.g. 23% African American girls 6-11 vs. 13% non-Hispanic Whites; 27% Mexican-American boys vs. 14% non-Hispanic Whites)

- Obesity is elevated among lower income children although there are differences by race/ethnicity.
Obesity Trends* Among U.S. Adults

BRFSS, 1985

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 1990

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 1995

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 2000

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Obesity Trends* Among U.S. Adults

BRFSS, 2005

(*BMI ≥30, or ~ 30 lbs overweight for 5’ 4” person)
Trends in Child and Adolescent Overweight

Percent

1963-65 \hspace{1cm} 1966-70 \hspace{1cm} 1971-74 \hspace{1cm} 1976-80 \hspace{1cm} 1988-94 \hspace{1cm} 1999-00 \hspace{1cm} 2001-2 \hspace{1cm} 2003-4

Note: Overweight is defined as BMI $\geq$ gender- and weight-specific 85th percentile from the 2000 CDC Growth Charts.
Source: National Health Examination Surveys II (ages 5-11) and III (ages 12-17), National Health and Nutrition Examination Surveys I, II, III and 1999-2004, NCHS, CDC.
Prevalence of Overweight Among Children and Adolescents Ages 6-19 Years, 1976-2004

From: RWJF Report on State Action to Promote Nutrition, Increase Physical Activity and Prevent Obesity, October 2006
An Uphill Battle...

- What are we fighting against?
  - Media
  - Biological preferences and reluctance
  - Cultural practices
  - Social stigma

Obesity is a National Crisis!!

Today’s children are likely to be the first generation to live shorter less healthy lives than their parents.
Tennessee Obesity Facts

- Tennessee has the 5th highest rate of adult obesity (27.8%)
- Tennessee has the 4th highest rate of overweight youths (ages 10-17) at 20%

Facts courtesy of Trust For America’s Health (TFAH) F as in Fat: How Obesity Policies are Failing in America 2007 Report
Regional Differences: Tennessee Is Not Alone...

- 8 of the 10 states with the highest rate of overweight children are in the South
- 10 of the 15 states with the highest rates of adult obesity are in the South

*Facts Courtesy F as in Fat, 2007*
Positive Steps

• Tennessee is one of 17 states requiring that school lunches, breakfasts, and snacks meet higher nutritional standards than the USDA requirement

• Tennessee is one of 22 states that has set standards for food sold in vending machines, a la carte, in school stores, or in school bake sales

• Tennessee is one of 16 states that screens students’ Body Mass Index (BMI) and fitness status and confidentially provides information to parents or guardians

• Facts courtesy of F as in Fat 2007
Michigan’s Impending Cardiovascular Disease Burden

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Prevalence</th>
<th>Rank Among US States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overweight Youth (Ages 10-17)</td>
<td>14.5%</td>
<td>#20- worst</td>
</tr>
<tr>
<td>Obese Adults (BMI greater than 30.0)</td>
<td>26.8%</td>
<td>#9- worst</td>
</tr>
<tr>
<td>Adult Physical Inactivity (Physical activity in past month)</td>
<td>22.5%</td>
<td>#28- worst</td>
</tr>
<tr>
<td>Adult Diabetes</td>
<td>8.3%</td>
<td>#11- worst</td>
</tr>
<tr>
<td>Adult Hypertension</td>
<td>27.3%</td>
<td>#13- worst</td>
</tr>
</tbody>
</table>

Source: Trust for America’s Health, *F as in Fat: How Obesity Policies are Failing in America*, 2007
How Does Michigan Measure Up?

- Michigan is NOT one of 17 states that require their school lunches, breakfasts, and snacks to meet higher nutritional standards than the U.S. Department of Agriculture (USDA) requires.

- Michigan is NOT one of 22 states that have set nutritional standards for foods sold in vending machines, a la carte, in school stores, or in bake sales in schools, and the state is not one of 26 states that limit when and where these foods may be sold on school property beyond federal requirements.

- Michigan is NOT one of 16 states that screen students' body mass index (BMI) or fitness status and confidentially provide information to parents or guardians.

Source: Trust for America’s Health, *F as in Fat: How Obesity Policies are Failing in America*, 2007
PROJECT
Healthy Schools
What Is Project Healthy Schools?

A program for 6th graders designed to increase physical activity and healthier food choices...

to begin now and last a lifetime!
Why 6th graders?

• A transitional age:
  - Increased awareness
  - More independence in food choices, both in and out of school

• The pragmatics
  - Allows for follow-up through middle school
  - Time to practice!
Why a School-Based Program?

• Children in the United States spend, on average, 900 hours a year and 13 developmentally critical years in school.

• Schools have more influence on young people than any other institution except the family.

• School-based approaches were identified as key to addressing the obesity crisis in a “Call To Action” issued by the U.S. Surgeon General.

Facts courtesy of F as in Fat  2007
Schools are Critical in Prevention and Early Intervention

- Fully 99 percent of young people ages 7-13 are enrolled in school.
- Students are in direct sustained contact with professionals who can recognize emerging problems.
- Schools are located in every community and are focal points of community life.

Source: National Assoc of State Boards of Education
Social Ecological Model

“The spheres of influence”
Project Healthy Schools
Collaborative Approach

• Developed to bring the resources of the community and the university together.
• Includes innovative strategies by involving a range of stakeholders in solutions.
• Has influence afforded by wide community engagement.
• Potential to develop new community capacities through use of available social capital.
The Project Healthy Schools Collaborative

UM Health System

Project Healthy Schools

UM Med School
UM Mott Children’s Hospital
UM Cardiovascular Center

Schools

Ann Arbor Public Schools
Ypsilanti Public Schools

Ann Arbor School Board
Ypsilanti School Board
Chartwells Food Service
Wellness Center

Students, Parents & Families
Administrators, Teachers & Other School Staff

Health Place
Community Health Services

MFIt
Health Ambassadors

U of M

UM School of Social Work
UM School of Public Health
UM Med School
UM Undergrads
UM Community
High School Students

Donors

Other Foundations
Private Donors*
Businesses*
Community Foundations

WeCan!
Free the Children
Agrarian Adventure
Food Systems Economic Partnership

Farm to School

Community Organizations

Hands On Museum
Altarum
Washtenaw County Health Department

*Please see list of specific donors
Project Healthy Schools
5 GOALS

#1- Eat more fruits and vegetables
Project Healthy Schools
5 GOALS

# 2-
Make Better Beverage Choices
Project Healthy Schools
5 GOALS

#3- Perform at least 150 minutes of physical activity each week
#4- Eat less fast and fatty food
#5- Spend less mindless time in front of the TV and computer
Project
Healthy Schools

Education

Environment ◀▶ Measurement
Program Components

- Hands-On Activities
- Fitness Assemblies
- Incentive Program
- Cafeteria Changes
- Education Campaign
- Outcome Measures
The Education

• 10 Health Activities in Advisory Period
• Incentive Program
• Web site for Students and families
• E-News for Parents
• E-communication with teachers, principals, teams
• Assemblies
The Activities:

- Physical Activity
- My Pyramid
- Portion Distortion
- Get the Beat
- Assessing Advertising

- Rainbow of Color
- The Facts on Fat
- Reducing Screen Time
- Better Beverages
Activity Details

- Offered in advisory period “homeroom” (about 20-25 minutes long)
- Simple lessons
- Interactive
- Hands on Props
- Taught by teachers, health ambassadors, volunteer parents, or PHS staff
Incentive Program

• Students receive points for recording minutes of exercise and healthy lunch options for the first three weeks of the program.

• Competition between advisory classrooms – a traveling “Wellness Trophy” awarded to the winning advisory.

• Participating students are entered in a drawing for rewards, such as Ipod shuffles, Borders gift certificates, water bottles and t-shirts.

• All participating students receive a small prize.

• The winning advisory is awarded a smoothie party and a field trip.
Assemblies

• Kickoff assemblies to introduce the program and get kids excited about activity.

• PE Activities teach kids about fun alternatives to typical exercise (i.e. Pilates, yoga, use of dyna-bands and loops)
The Health Ambassador Program

- Student volunteers who teach weekly activities, assist with health screenings, PE activities, and kickoffs.
- The program started last year to provide an educational link between the university and the community.
- Volunteers include graduate students from social work, public health, medical students, undergraduate students and parents.
Health Ambassador Program features:

- training in screening and data collection
- education to provide classroom activities
- hands on experience in the community
- opportunities to work in the schools to assist in environmental and policy change
- monthly seminar series connecting them to health-related programs and community and university leaders
Health Ambassadors are essential to PHS

- Enables PHS to reach out to more students than would be possible with current staff
- Provide valuable link to university health related programs
- Ensure PHS program sustainability through longterm relationship between the university and the school system.
The Environment

• Cafeteria re-engineering
• Vending machines - offer healthier options
• Healthy fund raisers
• Changes in school store options
• “Celebrate Health” communication campaign
  - posters
  - bulletin boards
  - winning students and classrooms
• Field Days- let the kids enjoy being physically active!
The Cafeteria Changes

Eliminated
• 2 for 1 Hot Dogs
• Double Cheeseburgers
• Candy in lunch line
• High fat meat pizza
• Pop Tarts
• Donuts
• Pastries
• Cookies
• Candy in Stores

Changed
• White flour bread/whole wheat bread
• Fried chips/Baked chips
• Coca-cola soda/Dasani water
• Slushy machine/100% Juices
• Reduced pepperoni on pizza

Offered
• Salad/Fruit bar
• Carrots/ranch dip
• Yogurt
• Celery/peanut butter
• Whole grain products
• Fresh fruit when available
• More Milk Choices
• Hard boiled eggs
The Measurement

- Height
- Weight
- BP
- 3 min. Step Test
- Lipid Profile
- Glucose
- Before/After Questionnaire
The Health Screenings
Program Results to Date

- Response to the program has been overwhelmingly positive
- 5 Schools, 1,250 students, many teachers involved
- 581 Students participated in 2006-07 screening
- Healthy choices have been added to the school menu - 10% increase in fruits/vegetables consumption in cafeterias
Student Study Population - Racial Distribution

- White: 59%
- Asian: 15%
- Hispanics: 14%
- Black: 4%
- Native American: 2%
- Other: 6%

n = 590
Student Study Population - School distribution

- Clague: 23%
- Forsythe: 19%
- Slauson: 22%
- Scarlett: 16%
- Tappan: 20%

n = 598
Student Study Population - Gender Distribution

- Male: 51%
- Female: 49%

n = 595
# Screening Results

## Pilot Data

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
<th>1 year*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cholesterol</td>
<td>169</td>
<td>151</td>
<td>152</td>
</tr>
<tr>
<td>LDL Cholesterol</td>
<td>90</td>
<td>74</td>
<td>86</td>
</tr>
<tr>
<td>Serum Glucose</td>
<td>103</td>
<td>97</td>
<td>96</td>
</tr>
</tbody>
</table>

N=88 students  
Data from 2004-05 one school  
*One year post follow-up
## What Have We Found?

<table>
<thead>
<tr>
<th>Risk Marker</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overweight &gt; 85%</td>
<td>32.0% (92)</td>
</tr>
<tr>
<td>Obese &gt; 95%</td>
<td>5.0% (13)</td>
</tr>
<tr>
<td>Systolic BP ≥ 124 mmHg</td>
<td>8.4% (24)</td>
</tr>
<tr>
<td>Total Cholesterol ≥ 200</td>
<td>7.3% (21)</td>
</tr>
<tr>
<td>HDL Cholesterol &lt; 35</td>
<td>5.4% (12)</td>
</tr>
</tbody>
</table>

“**At Risk**” – 40% (116)*

*One or More of BMI, SBP, TC, LDL, HDL, Glucose

N= 292

Data from 2005-06 Three Schools
## 2005-06 Screening Results from 3 Schools

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>Baseline</th>
<th>Follow up</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>274</td>
<td>19.5 ± 3.5</td>
<td>19.9 ± 3.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mean Systolic BP</td>
<td>273</td>
<td>109.1 ± 12.5</td>
<td>107.9 ± 11.4</td>
<td>0.11</td>
</tr>
<tr>
<td>Mean Diastolic BP</td>
<td>273</td>
<td>63.6 ± 8.7</td>
<td>62.3 ± 7.8</td>
<td>0.01</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>213</td>
<td>168.8 ± 26.4</td>
<td>154.4 ± 26.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HDL</td>
<td>214</td>
<td>55.6 ± 12.5</td>
<td>50.1 ± 12.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>LDL</td>
<td>172</td>
<td>86.3 ± 24.6</td>
<td>82.8 ± 22.6</td>
<td>0.1</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>214</td>
<td>142.5 ± 92.3</td>
<td>109.4 ± 66.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Random Glucose</td>
<td>212</td>
<td>96.0 ± 13.0</td>
<td>92.7 ± 15.2</td>
<td>0.08</td>
</tr>
<tr>
<td>Resting Heart Rate</td>
<td>274</td>
<td>79.6 ± 10.4</td>
<td>79.3 ± 10.3</td>
<td>0.64</td>
</tr>
<tr>
<td>Recovery Heart Rate</td>
<td>263</td>
<td>103.5 ± 15.9</td>
<td>104.7 ± 16.8</td>
<td>0.20</td>
</tr>
</tbody>
</table>
Measuring Behavior Change

Yesterday how many times did you eat chocolate candy?

P < 0.001

PHS Data 05-06 N=274
Yesterday how many times did you eat fruit?

PHS Data 05-06 N=274
During the past 12 months how many sports teams run by your school did you play?

Percentage of Students

<table>
<thead>
<tr>
<th></th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>40</td>
<td>25</td>
</tr>
<tr>
<td>1</td>
<td>35</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>30</td>
</tr>
</tbody>
</table>

P < 0.001

PHS Data 05-06 N=274
## 2006-07 Screening Results from 5 Schools

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>Baseline</th>
<th>Follow up</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>578</td>
<td>19.96±4.17</td>
<td>20.47±4.31</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mean Systolic BP</td>
<td>575</td>
<td>107.32±10.77</td>
<td>106.05±10.222</td>
<td>0.006</td>
</tr>
<tr>
<td>Mean Diastolic BP</td>
<td>575</td>
<td>64.68±7.76</td>
<td>62.52±6.90</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>441</td>
<td>167.39±30.15</td>
<td>160.22±28.29</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HDL</td>
<td>441</td>
<td>52.93±12.34</td>
<td>49.86±12.54</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>LDL</td>
<td>381</td>
<td>92.07±27.13</td>
<td>90.16±26.05</td>
<td>0.051</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>403</td>
<td>124.00±70.81</td>
<td>114±67.22</td>
<td>0.008</td>
</tr>
<tr>
<td>Random Glucose</td>
<td>439</td>
<td>95.45±15.06</td>
<td>94.55±14.08</td>
<td>0.291</td>
</tr>
<tr>
<td>Resting Heart Rate</td>
<td>576</td>
<td>81.27±12.02</td>
<td>79.93±10.46</td>
<td>0.010</td>
</tr>
<tr>
<td>Recovery Heart Rate</td>
<td>516</td>
<td>101.29±17.94</td>
<td>104.15±16.60</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

PHS Data from five school sites, 2006-07
During the past 12 months, on how many Rec & Ed or Intramural teams did you play?

PHS Data 06-07 N=578
Yesterday, how many times did you eat fruit?

PHS Data 06-07 N=578
How often do you eat in the cafeteria?

Percentage of Students

almost always | Sometimes | almost never

Pre | Post

P=0.004

PHS Data 06-07 N=578
Yesterday, how many times did you eat chocolate candy?

![Bar chart showing the number of times students ate chocolate candy, with Pre and Post data.](attachment:chart.png)

PHS Data 06-07 N=578
What type of milk do you usually drink?

![Bar chart showing percentage of students' milk preferences.](attachment:image.png)

- **Reg**: Pre 5%, Post 5%
- **Low-fat**: Pre 15%, Post 15%
- **Skim**: Pre 40%, Post 40%
- **All of the above**: Pre 20%, Post 20%
- **Other**: Pre 10%, Post 10%

PHS Data 06-07 N=578

P<0.001
On how many of the past 7 days did you exercise that made your heart beat fast?

P<0.001

PHS Data 06-07 N=578
How many hours per day do you usually spend on the computer away from school?

Percentage of Students

P = 0.05

PHS Data 06-07 N=578
How many hours per day do you usually spend playing video games?

![Bar chart showing percentage of students per hour of gaming time.](chart_image)

- **Pre**: 0 hr = 40, half hr = 25, 1 hr = 20, 2 hr = 10, 3 hr = 5, 4 hr = 2, 5 hr = 1, 6 hr = 1
- **Post**: 0 hr = 42, half hr = 24, 1 hr = 19, 2 hr = 10, 3 hr = 7, 4 hr = 3, 5 hr = 1, 6 hr = 1

Statistical significance: $p = 0.019$

**PHS Data 06-07 N=578**
Project Healthy Schools

Getting Started

Step 1. Develop your coalition

- Check your area for existing coalitions.
- Look for stakeholders from the community at large: representatives from hospital, school district, health department, community organizations, business, university
Step 2. Identify Funding

• Work with your school district and existing programs.
• Identify community foundations and community groups who traditionally support childhood programs.
• Look to coalition members to identify key community funding sources.
Step 3. Build Your Coordinated School Health Team (CSHT):

- To assess school health environment
- Identify opportunities for change
- Develop and implement plans for healthy change
- Design and support policy and environment changes
CSHT should include:

- PE and health teacher
- School nurse
- Parents
- Food Service Manager
- School counselor
- PTO member
- Students
- School health champion
The School Health Champion:

• Brings the team together and champions your program.
• Takes care of logistics and keeps you informed of the where, when, and why of your school.
• Could eventually take ownership of the program.
Step 4. Complete the School Health Index (SHI)

A self assessment and planning tool to determine areas of strength and opportunities for change regarding health and safety policies programs and environment.

• See http://www.cdc.gov/HealthyYouth/SHI instructions.htm
PHS Wellness Policy Success

- Changing to healthier options in vending machines.
- Banning soda sales
- Offering healthy foods in after school store
- Adding salad bar
- Implementing recess before lunch
Bringing PHS to Your School District

- Start at the top with your superintendent of schools and board members.
- Meet with middle school principals.
- Get buy-in from sixth grade teachers.
Lessons Learned

• Work with teachers on their terms...Maslow’s hierarchy!
• Appreciate each school’s unique culture, including preferred modes of communication.
• Education needs to fit where teachers put it!
• Get teachers involved in personal wellness
  -Classes onsite
  -Charity Challenge
• Continuous and consistent communication is key!
Lessons Learned

• Be flexible about scheduling and program delivery.
• Always embrace change.
• Parents are hard to reach but essential to program success. Use many modes of communication. Invite parents to work with your program.
• Link activities to outcomes schools care about.

• Always have a back up teaching plan.
Lessons Learned

• Provide Health Ambassadors/volunteers where requested.

• Recruit volunteers from many areas including graduate, undergraduate, and high school.

• Provide ongoing consistent communication and training for volunteers.

• Provide lots of healthy food during trainings!
Policies Needed

Schools

• Increase PE frequency, teacher certification requirements
• Increase PA time
• No withholding PE/PA
• Nutritional standards for all foods available in schools
• Breakfast for underserved
Policies Needed

Individuals/Families/Communities
• Increase access to recreational facilities (open schools; zoning to promote walkability, parks/recreational facilities)

Health Care System
• Wellness evaluations
• Insurance coverage wellness/prevention
“Never doubt that a small group of thoughtful, committed people can change the world. Indeed, it is the only thing that ever has.”

Mead