The Hampton Roads Child and Adolescent BMI Data Collection Initiative

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EPIDEMIC
Costs of Inaction

- Our Workforce - 1 in 3 adults obese
- Our Future Workforce – 1 in 5 kids obese
- Our Economy - $190 Billion healthcare costs, higher absenteeism among obese workers
- Our Lifespan – Chronic disease kills 7 of 10
- Our Health – 50% of deaths due to heart disease, stroke, cancer
- Our Kids – 23% of kids don’t get recommended 60 minutes of daily physical activity
Why don’t we measure weight status in schools?

- Priorities
- Mandate
- Time
- Staffing
- Too much already on the plate
Chronic diseases are responsible for seven of 10 deaths among Americans each year and treatment for people with chronic conditions accounting for roughly 75 percent of the $2.5 trillion spent on annual U.S. medical care costs.
In addition to the direct costs, indirect costs of chronic conditions, including productivity losses, compound the problem. The best way to avoid these costs is through prevention beyond the doctor’s office – changing the behaviors that result in these chronic conditions.

Trust for America’s Health: A Healthier America 2013: Strategies to move from sick care to health care in the next four years.
The condition of excess body fat which can lead to such health risks as elevated cholesterol, triglycerides, or insulin levels; high blood pressure; sleep apnea; orthopedic complications; and mental health problems.
• Body Mass Index

• Ratio of an individual’s weight to height squared (kg/m²) \[\text{weight (lb)/height (in) } \times 703\]

• Used to estimate a person’s risk of weight-related health problems
BMI

• Does not directly measure body fat: correlates with body fat

• Most widely used measure of weight-related health risk: direct measures of body fat (skinfold measures, underwater weighing) are invasive & costly
• BMI measurement relatively easy, inexpensive, noninvasive & quick

• Compares BMI to other youth of the same sex/age in reference population
Weight Status

- Identified from BMI-for-age percentile.
- See www.cdc.gov/growthcharts

Obese \[\geq 95^{\text{th}} \text{%ile for age}\]
Overweight \[\geq 85^{\text{th}} \text{%ile} & < 95^{\text{th}} \text{%ile}\]
Normal \[\geq 5^{\text{th}} \text{%ile} & < 85^{\text{th}} \text{%ile}\]
Underweight \[< 5^{\text{th}} \text{%ile}\]
Surveillance versus Screening

PREVALENCE OF OVERWEIGHT IN CHILDREN AND ADOLESCENTS

- 6 to 11
- 12 to 19

Your child’s results are listed below:

Height: 57.38 inches  Weight: 106.00 pounds

The CDC has established the following benchmarks:

- Underweight: BMI less than 50
Surveillance

- Systematic & anonymous collection, analysis, and interpretation of data from a census or representative sample
- Intent: to identify % of students in each weight category
- Does not inform parents of child’s weight status
Surveillance

Surveillance goals
1. Describe trends over time
2. Create awareness
3. Spark policy & environmental improvement
4. Identify new trends
5. Monitor intervention outcomes
6. Monitor progress towards achieving health objectives
Screening

• Assesses individual weight status of students & detects individuals at risk
• Provides parents with results, explanation, recommended action, tips on healthy nutrition, PA, & weight management
• Data also may be used for surveillance
Screening goals:
1. Prevent/reduce obesity
2. Correct parental misperceptions of child’s weight status
3. Motivate healthy lifestyle
4. Stimulate medical care when needed
5. Increase internal awareness
### AAP Criteria for a Successful Screening Program in Schools

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease</td>
<td>Undetected cases must be common or new cases must occur frequently and the disease must be associated with adverse consequences</td>
</tr>
<tr>
<td>Treatment</td>
<td>Effective treatment must be available and early intervention must be beneficial</td>
</tr>
<tr>
<td>Screening Test</td>
<td>The test should be sensitive, specific, and reliable</td>
</tr>
<tr>
<td>Screener</td>
<td>The screener must be well trained</td>
</tr>
</tbody>
</table>
AAP Criteria for a Successful Screening Program in Schools, cont.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Target Population</td>
<td>Screening should focus on groups with high prevalence of the condition/disease in question or in which early intervention will be most beneficial</td>
</tr>
<tr>
<td>Referral &amp; treatment</td>
<td>Those with a positive screening test must receive a more definitive evaluation and, if indicated, appropriate treatment</td>
</tr>
<tr>
<td>Cost/benefit ratio</td>
<td>The benefit should outweigh the expenses (i.e., costs of conducting the screening and any physical or psychosocial affects on the individual being screened)</td>
</tr>
</tbody>
</table>
AAP Criteria for a Successful Screening Program in Schools, cont.

<table>
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<tr>
<th>Criteria</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Site</td>
<td>The site should be appropriate for conducting the screening and communicating the results</td>
</tr>
<tr>
<td>Program maintenance</td>
<td>The program should be reviewed for its value and effectiveness</td>
</tr>
</tbody>
</table>

Hampton Roads Child and Adolescent Weight Status Measurement Initiative

Why initiate this?

- **NO** reliable local data
- No uniform data collection system
- Virginia mandates health screenings but not BMI
- Schools hesitant to add non-mandated, unfunded tasks
• **Reason for schools to participate:**
  Association exists between student weight status & academic performance

• **Reason for community partnership:**
  Overweight/obesity are associated with multiple chronic diseases which are biggest drivers of healthcare costs – everyone pays for this
United States
Current Practices

United States

• Fewer than half of elementary, middle and high schools report measuring for BMI
• 22.4% of states mandated to assess BMI (Brenner, Wheeler, Wolfe, 2006)
• 34.7% overweight/obesity rate for children and adolescents, ages 10 to 17 yrs. (Ogden, et al., 2010)
California (1995) Surveillance & Fitness gram, G 5, 7, 9
Arkansas (2003) Surveillance & screening, G K, 2, 4, 6, 8, 10
Illinois (2004) Surveillance, uses school physicals G k, 5 & 9 and IL Health Dept. analyzes
Florida (1973) Surveillance, G 1,3,6
Louisiana (2004) Fitness gram heights and weight, G 3, 5, 7, 9 and 11, data gathered by PE teachers
New York (2007) Screening & surveillance. School nurses collect health certificates from students prepared by health care provider in G K, 2, 4, 7 and 10. Describes if student is fit to permit school attendance
Pennsylvania (2004) Screening and surveillance. Height & weight measured in school, all grades

Tennessee (2000) Screening and surveillance in selected rural districts, Grades K, 2, 4, 6, 8 and 10, conducted by school nurses.


West Virginia (2005) – Surveillance. Use a scientifically drawn sample of students as an indicator to measure progress toward promoting healthy lifestyles in West VA. G K, 2, 5, 7, 9, and 11. School nurses measure

Source Nihiser et al. (2007). Body mass index measurement in schools. J of School Health 77(10)
Virginia
**Virginia**

- Weight status data collection is not mandated
- Some districts elect to measure
- Measurement occurs at various time points
- Instrumentation & calibration varies
- Grades measured varies
- No standardized, replicable, comparable system is employed
Virginia
Virginia Foundation for Healthy Youth, Virginia Nutrition and Physical Activity Survey (2011)

Obesity Reduction & Prevention

Prevalence of Obesity/Overweight Among Virginia Youth (ages 12-17).

22%

Prevalence of Obesity/Overweight Among Virginia Youth (under Age 18) by Region.

NORTH REGION
20%

CENTRAL REGION
17%

SOUTHWEST REGION
28%

SOUTHEAST REGION
24%

Source: 2010 Virginia Childhood Obesity Survey, VFHY
Virginia

<table>
<thead>
<tr>
<th>Overweight or Obese</th>
<th>Children (ages 10 - 17)</th>
</tr>
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<tbody>
<tr>
<td>2007 National Survey of Children’s Health; reported by parents - telephone</td>
<td>31%</td>
</tr>
<tr>
<td>2010 Virginia Childhood Obesity Survey; self-reported by youth - telephone</td>
<td>22%</td>
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</tbody>
</table>
Obesity-related Monetary Costs in Virginia

<table>
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<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Annual HC costs related to obesity (2003)</td>
<td>$1.6 billion</td>
</tr>
<tr>
<td>Residents’ state &amp; federal tax burden from obesity-related gov’t expenditures</td>
<td>$222 per person</td>
</tr>
<tr>
<td>Portion of state budget covering obesity &amp; its health consequences</td>
<td>5.6%</td>
</tr>
</tbody>
</table>

Finkelstein,, Trogdon, Cohen, & Dietz, 2009, taken from VFHY website
American Academy of Pediatrics recommends annual BMI assessments to identify children’s obesity risk (AAP, 2003)

Institute of Medicine recommends schools annually conduct BMI assessments and inform parents of their child’s results (IOM, 2005)
Aims

Hampton Roads Child and Adolescent Weight Status Measurement Initiative

- Create efficient & replicable weight status surveillance measurement methodology for schools
- Provide community with important health data
- Recruit & assist school districts to implement weight measurement methodology
- Analyze & report results
Protocol

Personnel

• Contact superintendent, explain project, gain support
• Superintendent appoints Project Manager & Information Services Manager
Protocol

Project Manager

1. Coordinates with principals & school nurses to schedule measurement dates
2. Reserves school measurement sites
3. Appoints & instructs school staff in measurement conduct
4. Develops consent process
5. Coordinates with information systems manager
Protocol

Information Systems Manager

1. Provides dedicated, secure laptop & external hard drive
2. Preloads demographic data
3. Designs longitudinal database
4. Assists or instructs school staff on computer operation
5. Manages data security
6. Provides de-identified data for analysis
7. Coordinates with project manager
Other Personnel Needed

1. **Parent volunteers.** Helpful assistance with student prep or computer operation
2. **Office personnel.** Help with computer
3. **School nurses or PE teachers.** Site location, conduct measurements & student assent
4. **How many?** On data collection day, have at least 3 people to keep order, measurement & computer operation
Protocol

**Process**

1. **Practice.** Use small sample in spring for new schools (adjust as needed) & insure staff expertise

2. **Consent.** Keep parents informed, included with fall screening permission
   - Best practice: opt-out
   - Child assent is given at measurement

3. **Consistent Time:** Measure in fall
Protocol

Process

4. **Consistent grade levels.** Measure grades K, 3, 5, 7, 10

5. **Consistent instrumentation.** Use calibrated electronic scale
   - Measures students <30 sec.
   - Can measure elementary school in ½ day
   - Manual scales can be used if calibrated with less efficiency
From BioMeasure
To your PC

BioMeasure
Glenview Health Systems
BMI-for-Age
Glenview, IL
Process

6. Measurement site:
   a. Ensure site is enclosed & private
   b. Assist children to line up in alpha order
   c. Provide list of student names to those measuring
   d. Help students take off shoes and heavy jackets
Process

   e. All students walk thru private site
   f. Opt-out students walk thru site
   g. Students with consent: staff explains process & ask for student assent to participate
   h. Students do not see, nor are told, height, weight or BMI
Protocol

7. IS Manager de-identifies data, sends to EVMS to analyze
8. EVMS creates report and presents to Superintendent
9. Superintendent reports to School Board (public)
10. School and community uses data to plan, initiate & measure interventions
• **2010.** Children’s Health System funded research to develop & test protocol in 4 HR school districts
  ▪ Accomack County
  ▪ Northampton County
  ▪ Norfolk
  ▪ Portsmouth
• Protocol adjusted for each district’s needs & lessons learned were shared between school divisions
2011. Weight status outcomes

- 44.1% of measured students in grades K, 3, 5, 7, 10 were overweight/obese (n=16,408) (31.8% US; 22.0% VA)
  - Range of school districts ow/ob rates: 40.8% - 48.1%
  - Grade 5 had highest percentage of ow/ob
  - No significant difference between male (42.8%) & female (45.1%) ow/ob

• Protocol adjusted for each district’s needs
• Lessons learned were shared between school divisions
• 3 of 4 districts made their data public
• **2012.** Accomack, Northampton, Portsmouth continued
  • Norfolk chose to measure bi-annually
  • Broadwater Academy & Franklin joined initiative
• Protocol continues to be refined as more/different types of school districts participate
• Schools have not yet seen their 2012 rates nor released their data.
• **2012. Weight status outcomes**

  - **42.9%** of students, grades K, 3, 5, 7, 10, were ow/ob (n=6,941) (31.8% US; 22.0% VA).
  - Range: 38.0% -- 46.7%
  - Grade 7 had highest percentage of ow/ob.
  - Females (44.3%) had slightly higher ow/ob rate than males (40.9%).

*Includes only public school districts; excludes Broadwater Academy.

### Outcomes 2011 - 2012

<table>
<thead>
<tr>
<th></th>
<th>Sample</th>
<th>Overweight or Obese</th>
<th>National*</th>
<th>State **</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>16,408</td>
<td>44.1%</td>
<td>34.8%</td>
<td>22.0%</td>
</tr>
<tr>
<td>2012</td>
<td>6,941</td>
<td>42.9%</td>
<td>34.8%</td>
<td>22.0%</td>
</tr>
</tbody>
</table>

**EVMS Measuring children and adolescents weight status in Hampton Roads 2011 – 2012**
- Ogden et al., 2012
- **VFHY, 2011**
Outcomes

- Consistent regional protocol in place
- Comparable baseline weight status data now exists in five school districts
- Intervention outcomes are measurable
- Improves resource allocation by schools & community
Outcomes

• Developed national learning collaborative on school-based BMI measurement
• Data strengthens grant applications & local funding potential
• Project accepted for presentation at 2012 American Public Health Association & 2013 Weight of the State conference
Outcomes

• Awareness of weight status stimulated local action:
  ▪ Walkability & bikability assessments & improvements
  ▪ Faculty & staff wellness programs
  ▪ Student civic engagement projects
  ▪ Healthy restaurant initiatives
  ▪ Community-wide physical activity campaigns
  ▪ Breastfeeding support interventions
  ▪ Community gardens
  ▪ Stairwell use programs
  ▪ New obesity prevention coalitions formed
  ▪ Key high level leaders engaged
Challenges

- Equipment expensive, heavy & prone to glitches/repairs versus slower manual systems
- Smaller districts have technology challenges
- Larger districts need special recruitment strategies
Challenges

- School districts rely on EVMS project team as catalyst
- Year-to-year funding cycle creates sustainability challenges
• Protocol is systematic, replicable & comparable
  ▪ Instrumentation: Biomeasure electronic measuring system
  ▪ 30-second per child measurement
  ▪ Grades measured (K, 3, 5, 10)
Strengths

- Consistent measurement time (fall)
- Analysis & reporting mechanisms
- Coaching, encouragement & technical assistance to schools
Strengths

• Protocol is efficient:
  ▪ Can measure 2 elementary schools/day
  ▪ One high school or one middle school/day

• Data prompted action in 5 districts

• Ability to measure intervention outcomes over time
Future Plans

• Assist five HR school districts in 2013

• Interest three other HR school districts in protocol

• Consult with interested other school districts throughout the Commonwealth
Be prepared to address:

- BMI data collection might have unintended negative consequences for youth, like creating stigma, harmful dieting behavior.
- Parents may respond inappropriately to BMI Reports, like putting child on diet without medical consultation.
Be prepared to address

- BMI programs are ineffective and waste resources (data is powerful)
- Weight is obvious – parents know when their child is overweight
- BMI screening program might distract attention from other school-based obesity prevention activities.
Obesity

• Epidemic in Virginia
• #2 cause of early death and disability
• A comprehensive plan is needed
• First step: conduct surveillance
QUESTIONS?

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