Planet Health: Case Study in Selective Prevention

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Primary Prevention: Expanding the Paradigm

- Traditional classification
  - Primary, secondary, tertiary
  - Based on clinical outcome
- Alternative classification
  - Appropriate to chronic, multifactorial conditions
  - Based on level of intervention

WHO. Obesity: Preventing and Managing the Global Epidemic. WHO Technical Report Series No. 894. Geneva: WHO, 2000.

Alternative Classification: Preventive Interventions

Universal/public health:

Selective prevention:

Targeted prevention

- Socio-cultural & physical environment
- Programs & policies: schools, worksites, clinics
- Management protocols

WHO. Obesity: Preventing and Managing the Global Epidemic. WHO Technical Report Series No. 894. Geneva: WHO, 2000.

Planet Health

- Steven Gortmaker, PhD *PI*
- Karen E. Peterson, ScD, RD *Co-PI*
- Jean L. Wiecha, PhD *Project Director*
- Nan Laird, PhD *Co-Investigator*

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Planet Health

- **6th-8th grade students**
- **10 ethnically diverse public schools, Boston area**
- **Schools randomly assigned:**
  - *5 Intervention, 5 control (delayed intervention)*
- **Planet Health or usual curriculum**:
  - *Fall 1995-Spring 1997*
- **Primary endpoint: obesity** (BMI and TSF* >85th **%tile)**

Planet Health: Theoretical Framework

Behavioral Choice Theory

- Reducing sedentary time coincident with a dietary intervention can decrease obesity among obese youth
- Provision of choice can enhance motivation and maintenance of behavior change

Social Cognitive Theory

- Emphasizes social & environmental factors influencing psychosocial and behavioral risk
- Focus on cognitive & behavioral skills to enable change in target behaviors; practice skills to strengthen perceived competence

Epstein LH et al. Effects of decreasing sedentary behavior and increasing activity on weight change in obese children. Health Psychology 1995;14:1-7.

Perry CL, Parcel GS, Stone E, Nader P, McKinlay SM, Luepker RV, Webber LS. CATCH: Overview of the intervention program and evaluation methods. Cardiovascular Risk Factors. 1992;2:36-44.

Interdisciplinary Curriculum

- **Health promotion materials are incorporated into existing school structure and core curricula, such as math, social studies, science, language arts & physical education**
- **Emphasizes participation by regular classroom teachers**

Clark DC, Clark SN. Interdisciplinary curriculum: meeting the needs of young adolescents. Schools in the Middle. 1994;3:4-7.

Carter J, Wiecha J, Peterson KE, Gortmaker SL. Planet Health. Champaign, Illinois: Human Kinetics Press, 2001.

Behavioral Targets

- Reduce TV viewing to less than two hours per day
- Increase moderate and vigorous activity
- Increase consumption of fruits and vegetables to five or more per day
- Decrease consumption of foods high in fat and saturated fat

Intervention Components

- Teacher training workshops
- Classroom lessons (16/year) in Math, Science, Language Arts, Social Studies
- Two-week TV reduction campaign
- Physical Education Micro-units
  (30 five- min units) & Fit-checks
- Wellness sessions for teachers (3)

Summary

- Obesity among girls in intervention schools was reduced compared to controls (OR 0.48; P=0.03)
- Remission of obesity > in girls (OR 2.4; P=0.04)
- Reductions in TV; both boys & girls
- Among girls, each hour of TV => reduced obesity (OR 0.86/hour; P=0.02)
- Dietary change in girls: increased fruit & vegetables (P=0.003); smaller increment in total energy intake (P=0.05)

Gortmaker SL, Peterson K, Wiecha J, Sobol AM, Dixit S, Fox MK, Laird N. Reducing obesity via a school-based interdisciplinary intervention among youth: *Planet Health*. Archives of Pediatrics and Adolescent Medicine. 1999;153:409-18.

Planet Health: Change in Obesity by Race/ethnicity

- Evidence for intervention impact by racial/ethnic group among girls
  - **Black (OR 0.14; 95% CI 0.04-0.51)**
  - **White (OR 0.48; 95% CI 0.20-1.13)**
  - **Hispanic (OR 0.38; 95% CI 0.03-5.3)**

(minimum cell size = 5)

Planet Health: Intervention Impact by School

Females:

Evidence for intervention impact in 4 of 5 schools. If the one ineffective site is dropped, intervention effect on obesity is: OR 0.31; P=0.0002

Males:

If the same school is dropped, intervention effect on obesity is OR 0.70; P=0.05

Does Television Viewing mediate Dietary Change?

- **Examine *Planet Health* effect on fruit & vegetable consumption via 2 pathways**
  - Directly through educational intervention
  - Indirectly through change in TV viewing
- **Intervention vs control (N=1,156)**
  - > decrease in TV hr (-.54, P=.0001)
  - > increase in fruit and vegetable intake (0.23, P=.05)
  - F/V effect NS after controlling for TV (0.14, p=.26)

Thomas TN, Boynton-Jarrett R, Wiecha J, Peterson K, Sobol AM, Gortmaker SL. Impact of a school-based intervention on fruit and vegetable intake through a mediating effect of TV viewing. APHA Annual Meetings 2003; A#70572

Planet Health: Safety

Girls in intervention group were *less than half as likely* as girls in control group to adopt disordered weight control methods
(YRBSS items: vomiting or laxatives, diet pills)

	Odds Ratio	**95% CI**
Control	reference	
Intervention	**0.41**	(0.22, 0.75)

Austin B, Field AE, Weicha JL, Peterson KE, Gortmaker SL. The impact of a school-based prevention trial on disordered weight control behaviors in early adolescent girls. Submitted 2004.

Planet Health: Discovery to Delivery

- **Proposal** development & funding (NICHD) **1992-1994**
- Implementation of RCT **1995-1997**
- **Efficacy** results published **1999**
- **Effectiveness** trial funded (CDC) **1999**
- *Planet Health* curriculum published **2001**
- 5-2-1 Go! Implementation (MDPH-HPRC) **2002-2004**
- **Cost effectiveness** published (CDC) **2003**
- 5-2-1 Go! Evaluation; RAP qualitative study **2004-2005**
- **Adoption & dissemination** (BCBS) **2004-2007**

Moving beyond Planet Health: *5-2-1 Go!*

Massachusetts Partnership for a Healthy Weight

- Statewide coalition; test interventions; enhance surveillance

Social ecological framework for behavior change

- Individual-level: Planet Health curriculum
- Environmental-level: School Health Index (SHI)

Group randomized design

- 13 middle schools: urban, rural
- Fall 2002-Spring 2004

Actigraph sub-study: validity of YRBSS activity items

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U48/CCU115807 (Harvard Prevention Research Center)

Dissemination and Partnerships

- ***Healthy Choices II***:

  MA Blue Cross Blue Shield funds public schools in 2004-5

  Implement nutrition & physical activity program

  - **Healthy Choices – before & after school**
  - **Planet Health curriculum**
  - **SHI – policy/environmental change**
  - **Community involvement**

- ***Rapid Assessment*** **(RAP):** Summer 2004

  Influences on adoption, sustainability of multi-component program

  Scaling up: challenges and need for flexibility

Site-specific approaches: What can we learn from surveillance?

- **Gaps in National Nutrition Monitoring**
  - NHANES: cross sectional, nationally representative
  - CDC surveillance systems: data unavailable grades K-8
- **School-based monitoring**
  - Local estimates of prevalence, incidence
  - Monitor trends in organizational settings that provide avenues for intervention
  - Demonstrate feasibility with existing personnel
- **5-2-1 Go! Evaluation tool**
  - Purposes: program evaluation & ongoing surveillance
  - Measures from current systems (YRBSS) & tested in previous research (Planet Health)

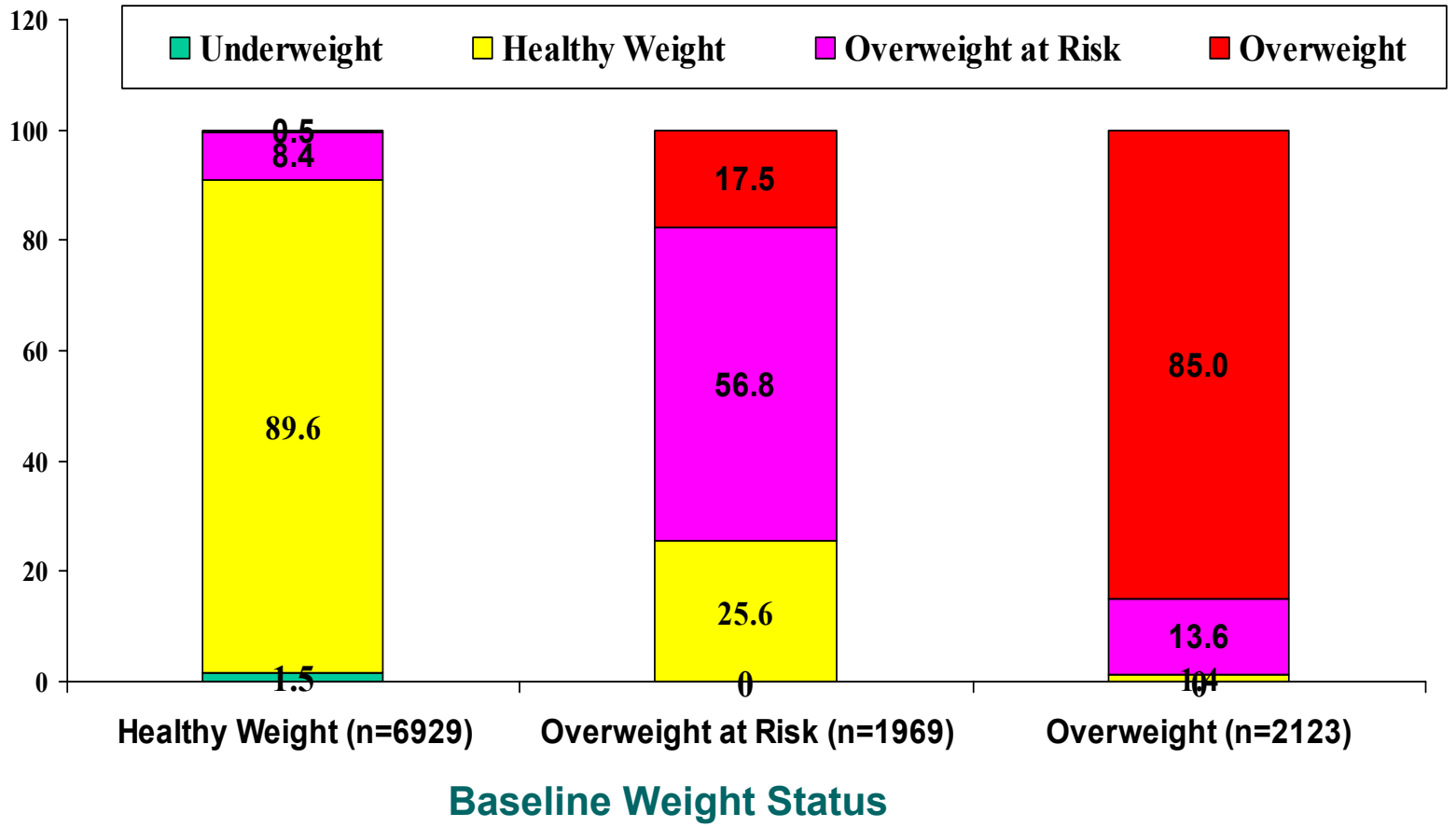
Cambridge Public School Surveillance System (CPSSS)

- **K to 8th grade, Cambridge Public Schools**
- **Weight & height measured in April by PE teachers**
- **Study cohort: four 1-year cohorts**
  - 1999-2000, 2000-2001, 2001-2002, 2002-2003
  - 16,598 measurements on 5,249 students
  - 41% W, 34% B, 14% H, 11%Asian, 1% other
- **Overweight (BMI ≥ 95th percentile)**
  - Prevalence 19.2%; at risk: 17.6%
  - Incidence: 4 % per year; remission: 15 %

Kim J, et al, 2003; 2004

1-year changes in weight status by baseline weight

Cambridge School Students 1999-2003: prospective cohort



Lessons and Questions

Why does it work?

- Role of TV in mediating change in diet & activity behaviors
- Optimizing growth & development
- Age, gender, cultural appropriateness
- Relative importance of individual & environmental influences

How does it work?

- Partnership & participatory approaches
- Adoption and sustainability
- Program evaluation
- Monitoring overweight

Stover G, Bassett MT. Practice is purpose in public health. AJPH 2003;93:1799-1801.

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