

# ***Preventing Diabetes in Community Settings: Evidence-Based Interventions to Promote Physical Activity***

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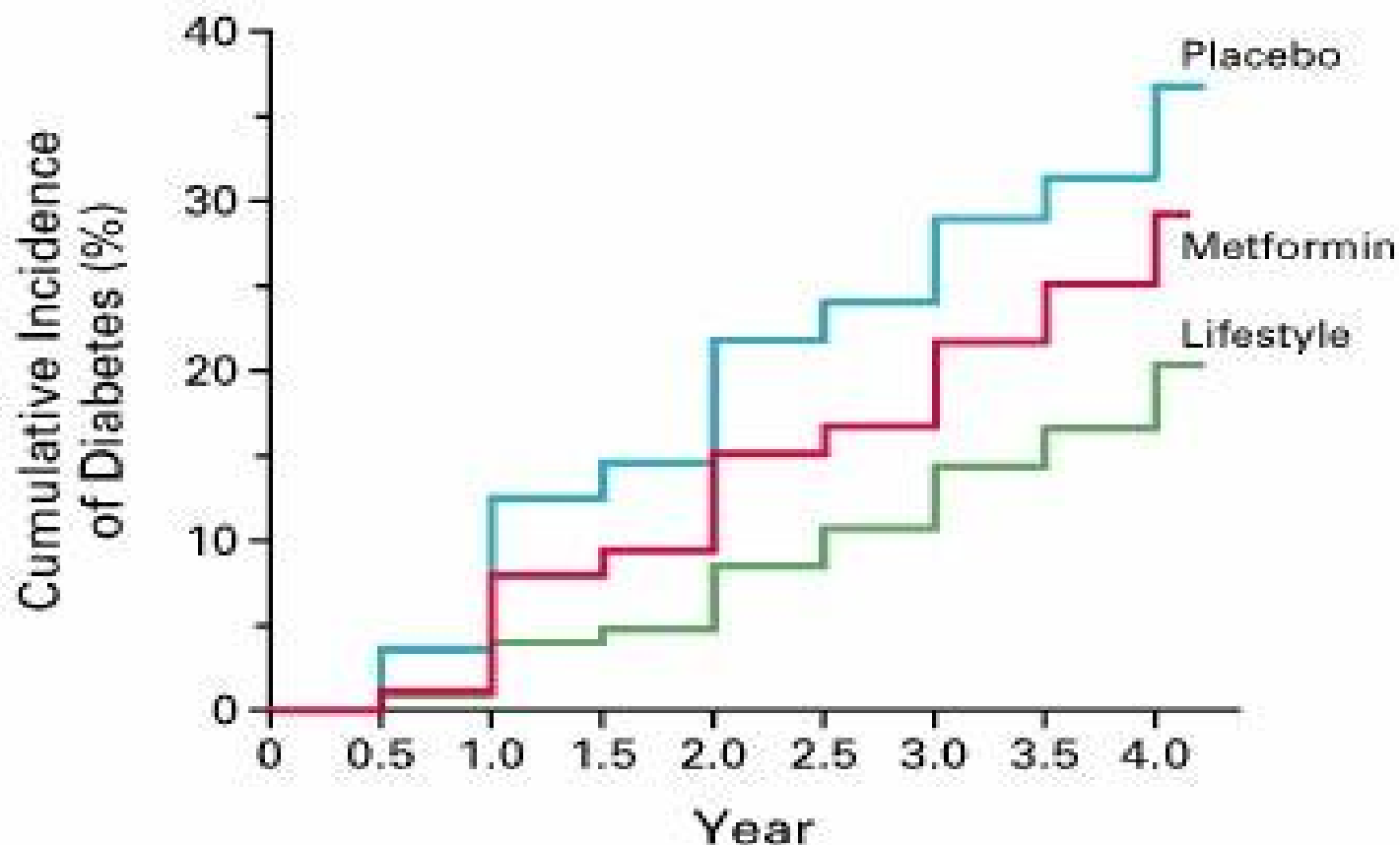
# Objectives

1. To understand the importance of physical activity promotion in prevention and control of type 2 diabetes.
2. To understand the basis for evidence-based physical activity interventions.
3. To describe the process and results of the *Guide to Community Preventive Services*.
4. To explore the limits of evidence-based decision making and practice.
5. To describe tangible steps and resources for practitioners implementing interventions.

# Prevention & Control of Type 2 Diabetes

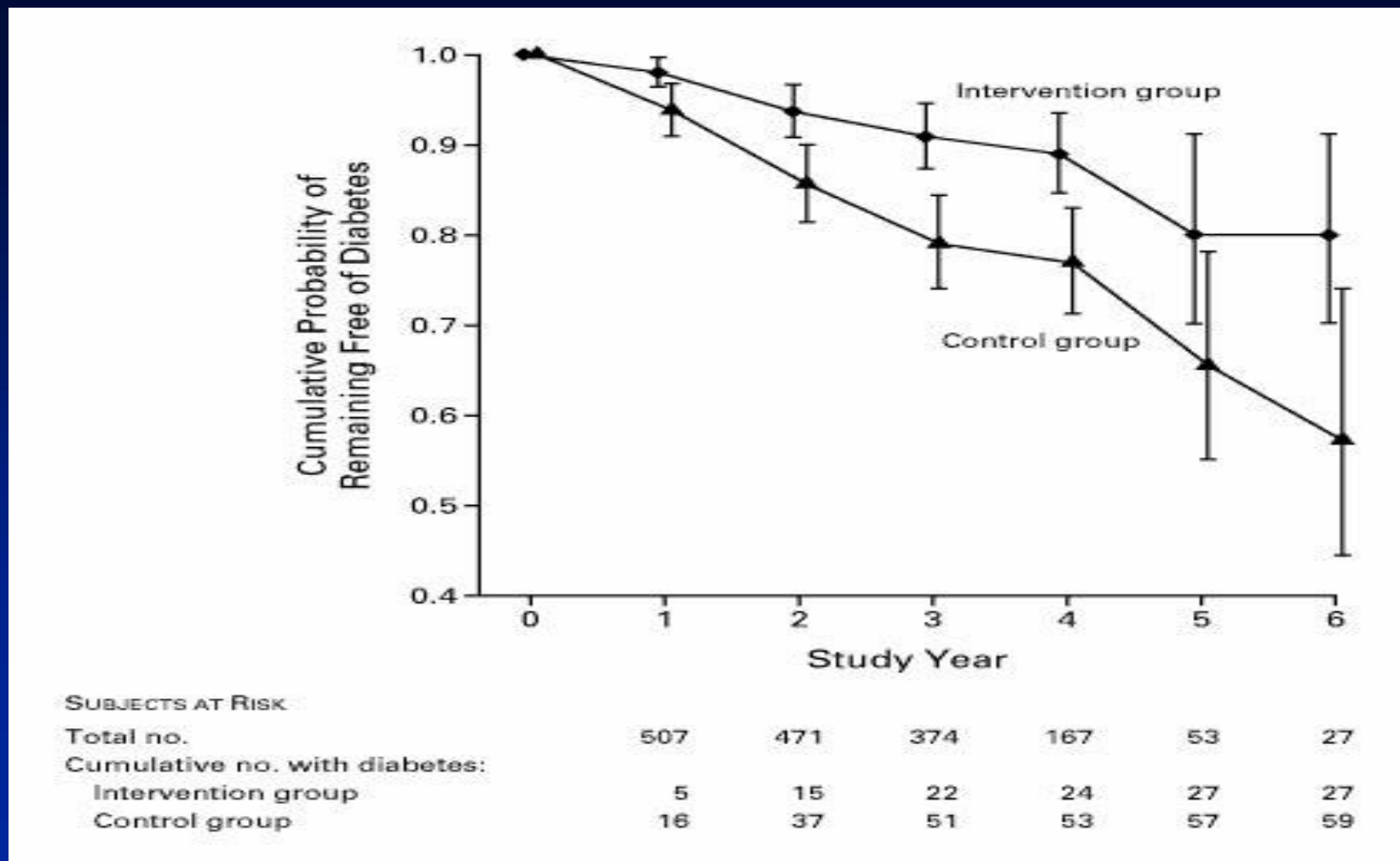
- Growing body of evidence
  - Randomized trials and prospective cohort studies
- Lifestyle changes (activity, healthy eating) decrease risk of developing type 2 diabetes
- Among individuals with diabetes, walking improves insulin sensitivity
- Key seems to be weight control

# Data from Recent Trials



Diabetes Prevention Program Research Group. Reduction in the Incidence of Type 2 Diabetes with Lifestyle Intervention or Metformin. *NEJM* 2002;346:393-403.

# Data from Recent Trials



Tuomilehto, et al, the Finnish Diabetes Prevention Study Group. Prevention of Type 2 Diabetes Mellitus by Changes in Lifestyle among Subjects with Impaired Glucose Tolerance. *NEJM* 2001; 344:1343-1350.



GREGORY

# Why do Programs/Policies Fail to Achieve Maximum Potential?

- Choosing ineffective intervention approach
- Selecting a potentially effective approach, but weak or incomplete implementation or “reach” (aka, Type III error)
- Conducting an inadequate evaluation that limits generalizability

# What is “evidence?”

“...the available body of facts or information indicating whether a belief or proposition is true or valid.”

## Where to go for evidence of intervention effectiveness?

What are evidence-based  
methods?

*OR*

How do we decide what works in  
public health interventions?

# What is an Evidence-Based Method?

- Based on interventions that have been evaluated in scientific studies
  - Generally in journal articles
- Systematic reviews
  - Based on narrative or quantitative techniques
- May (should) include economic evaluations
- In limited instances for emerging areas, expert opinions

# Advantages to Using Evidence-Based Methods

- Higher likelihood of success
- Identification of common indicators
- Defend/expand an existing program
- Advocate for new programs
- New knowledge is generated to help others

# Main Sources of Information on Intervention Effectiveness

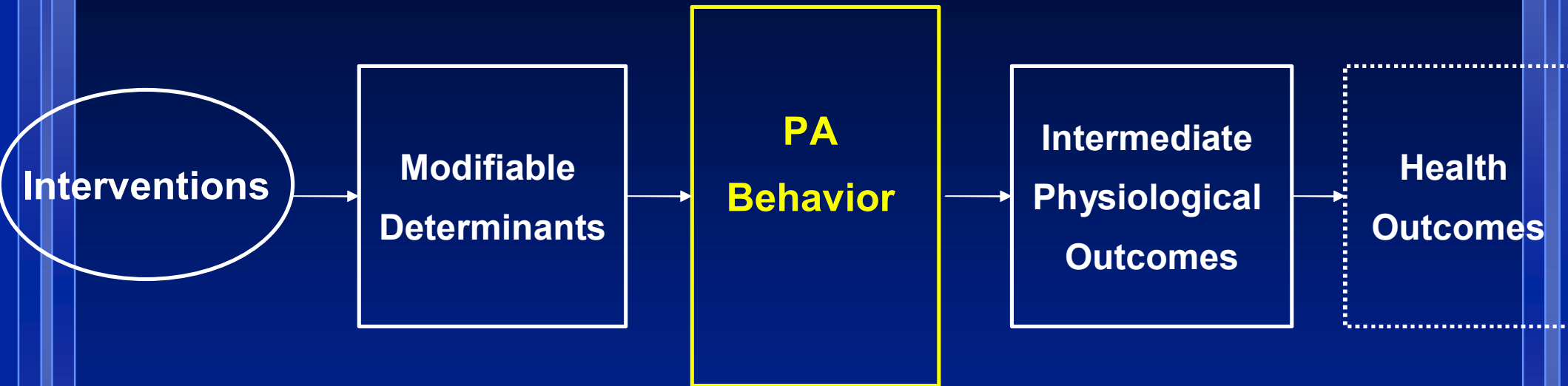
- Your own knowledge
- Other experts you work with
  - ✓ Other grantees, CDC, NIH, academe
- Input from the public or policy makers (stakeholders)
- Reading/searching the peer-reviewed literature
  - ✓ Look for systematic reviews or guidelines



**GUIDE TO**  
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**Systematic Reviews and  
Evidence-Based Recommendations**

# Logic Framework for PA Interventions



Mass Media  
Campaigns

Creation of  
worksite  
facilities

Knowledge,  
attitudes

Organizational  
policies to  
facilitate PA

Increased dose  
of PA (duration,  
frequency,  
intensity)

Aerobic  
capacity

Muscular  
endurance

Adiposity

Morbidity

Mortality

# The Community Guide

- Recommendations based on effectiveness
  - Not necessarily on feasibility
- Based on scientific evidence
- Systematic reviews
- Coordinated by CDC scientists
- Reviewed/approved by independent Task Force
- Follows on the work of the US Preventive Services Task Force

# Target Audience for the *Community Guide*

People who plan, fund or implement services  
and policies at health care systems,  
communities and states

# The *Community Guide* is a Valuable Tool

- Program planning
- Efficient use of resources
- Research agenda

# Rationale for the Methods and Process

- Obtain and distill the best available (or best feasible) evidence for decision making
- Studies reviewed based on
  - Design
  - Execution
- Rigor without *rigor mortis*

# Suitability of Study Design

- Greatest
  - Prospective *-and-*
  - Concurrent comparison
- Moderate
  - Retrospective *-or-*
  - Multiple measurements over time;  
no concurrent comparison
- Least
  - Single before-and-after measurement;  
no concurrent comparison *-or-*
  - Exposure and outcome measured at single point in time

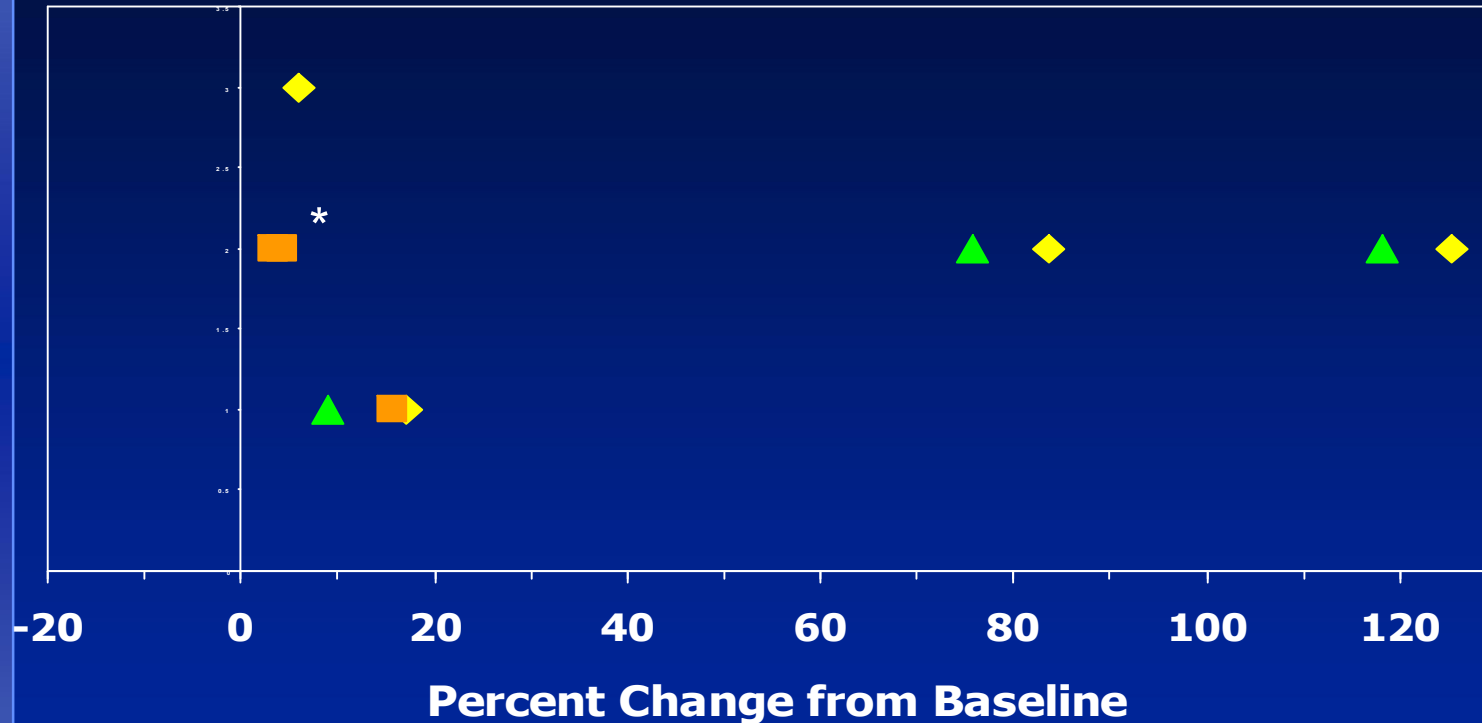
# What Factors Determine Quality of Execution?

- Description of intervention and study population
- Sampling procedures
- Exposure and outcome measurements
- Approach to data analysis
- Interpretation of results
  - Follow-up
  - Confounding
  - Other bias
- Other issues

# Search for Evidence

- PA behavior main focus of intervention
- English, since 1980
- Behavioral and/or fitness outcomes
- Incorporate a comparison group

# Physical Activity Measures by Study



Donnelly JE, 1996

SPARK, 1997

CATCH, 1996

◆ MVPA (mins/wk) ■ %Class time MVPA/VPA ▲ EE

\* 2 data points

% class time increase of 762% not shown

# Physical Activity Chapter Domains

1. Informational Approaches to Increasing PA
2. Behavioral and Social Approaches to Increasing PA
3. Environmental and Policy Approaches to Increasing PA

# 1. Informational Approaches

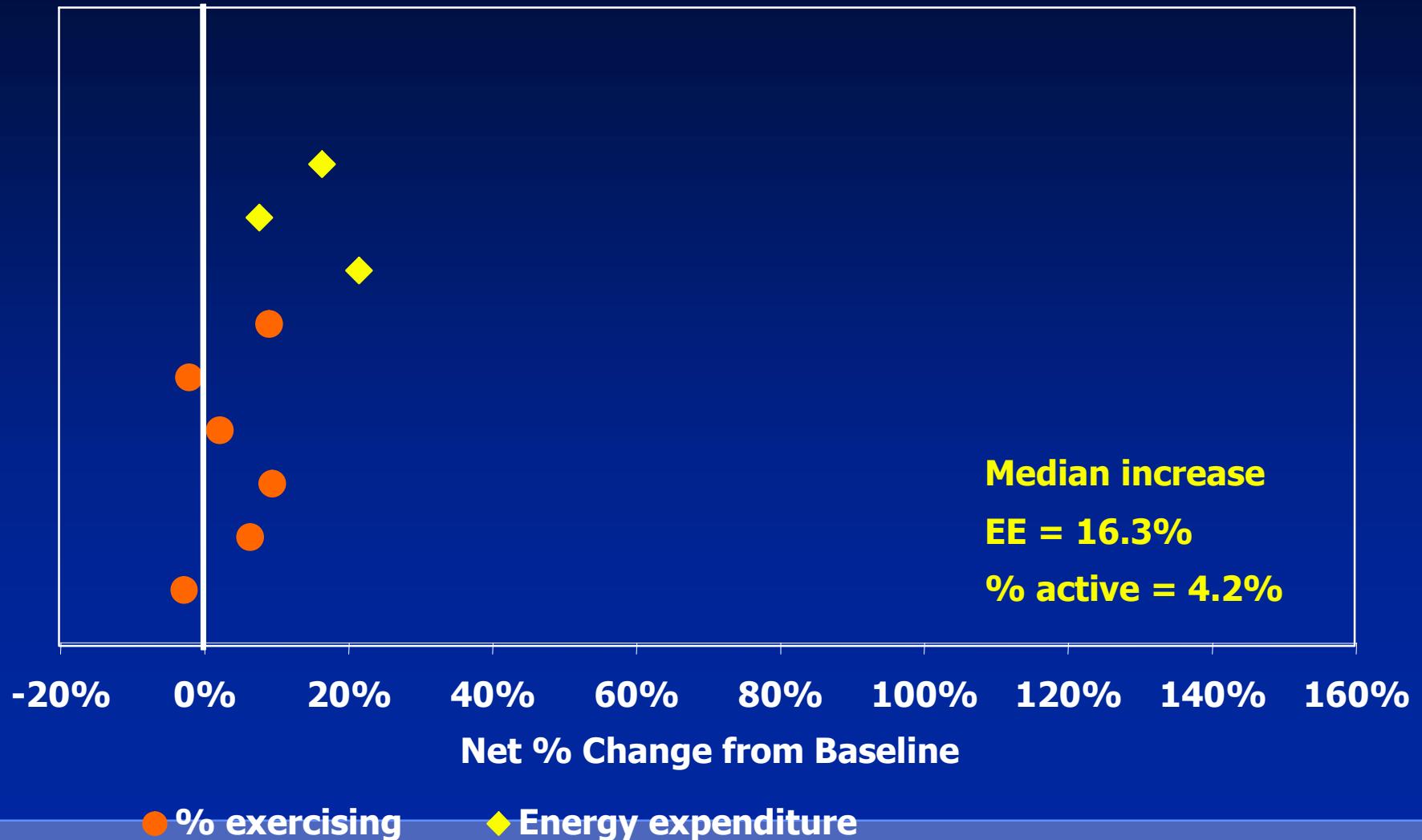
- Community-wide campaigns
- Mass media campaigns
- Point-of-decision prompts
- Classroom-based health education
  - Information provision
  - Decision making skills

# Community-wide campaigns

## Strongly Recommended

- Multi-component
  - May include: mass media, social support, education, environmental and policy change, risk factors screenings
- Transmitted through diverse media
  - For example: billboards, television, newspapers
- Directed at large audiences

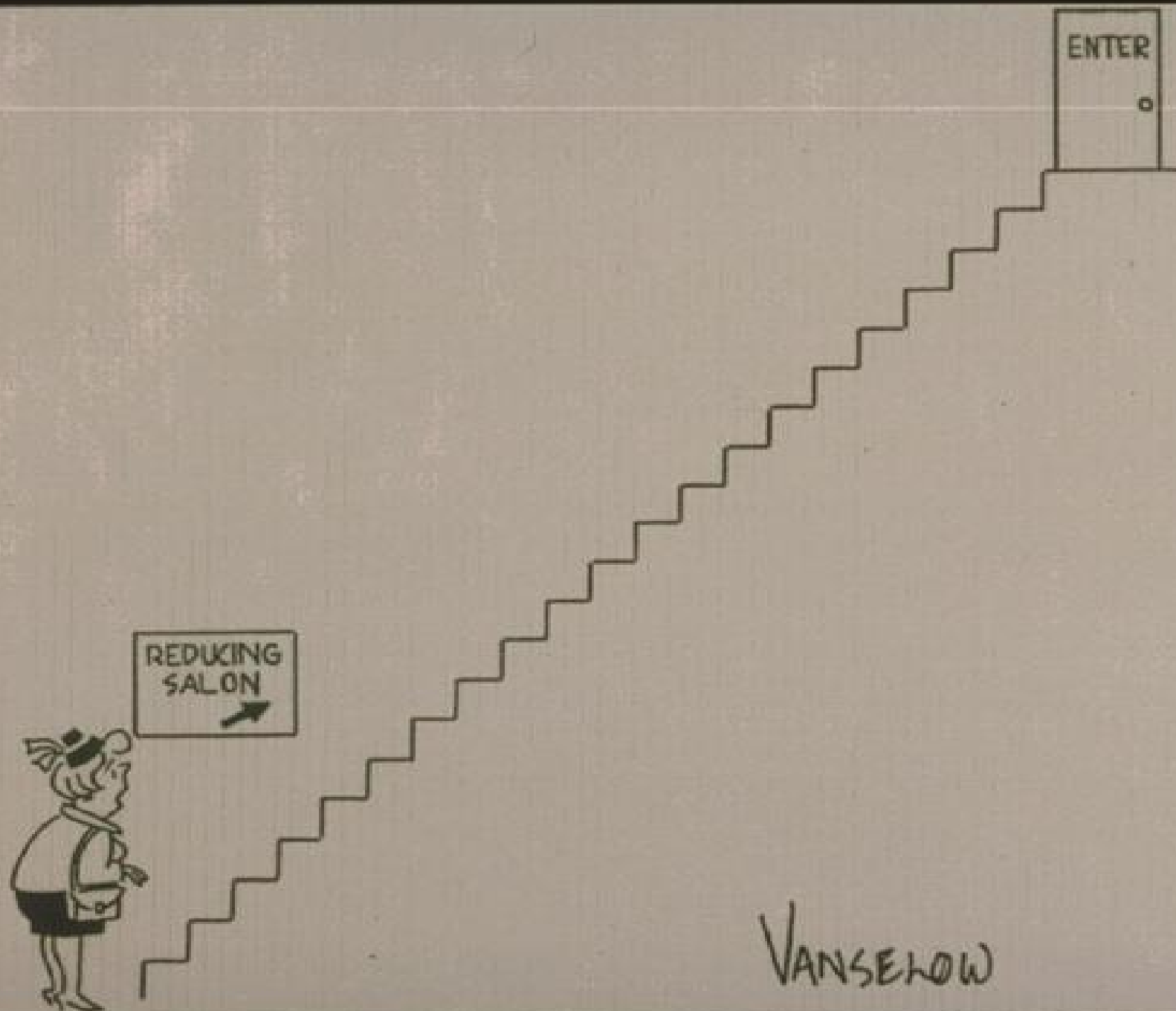
# Community-wide campaigns



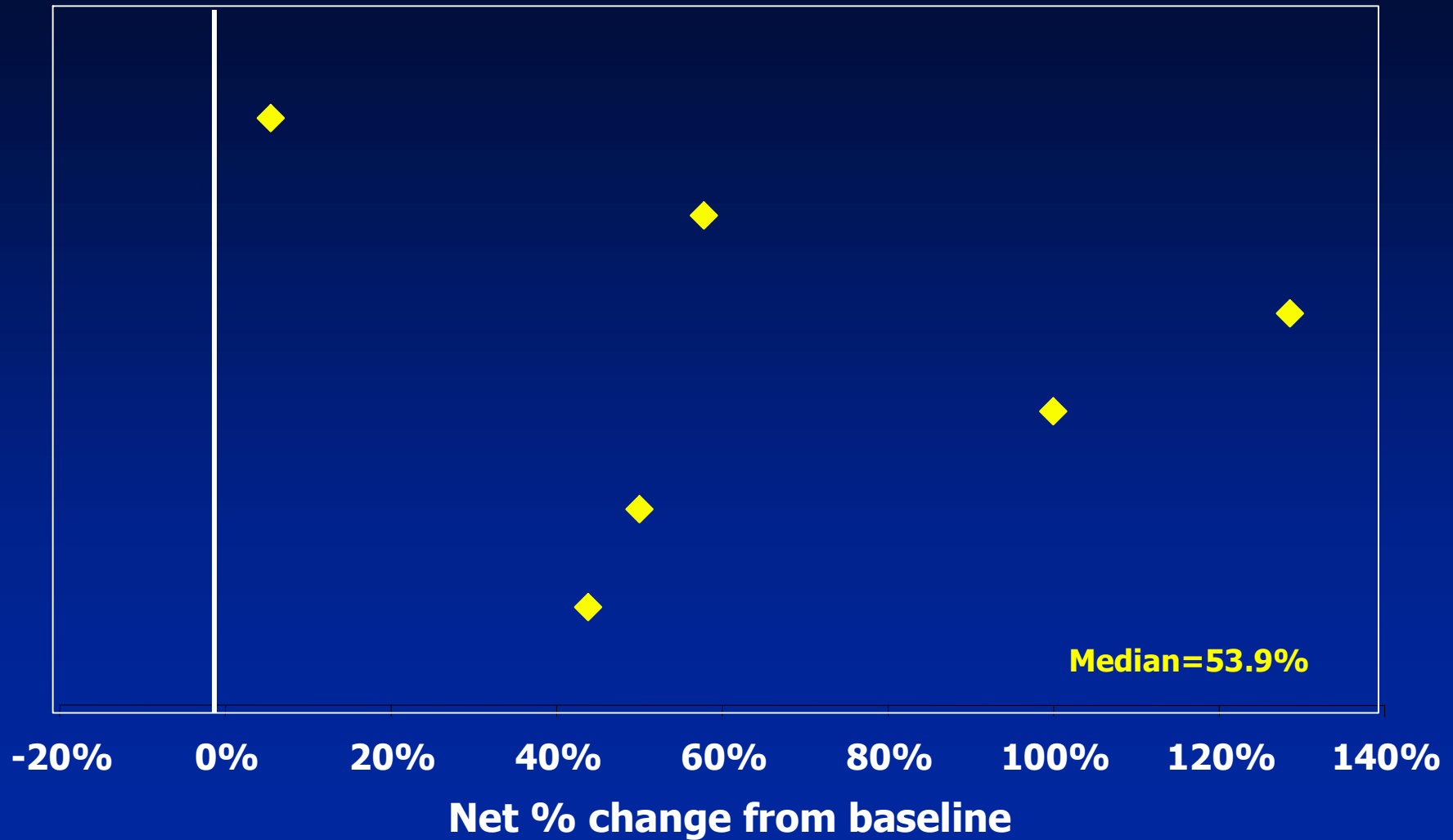
# Point-of-decision prompts to encourage stair use

Recommended





## Point-of-Decision Prompts Increase in Stair Climbers:



# Insufficient Evidence

- Mass Media Campaigns
- Classroom-based health education
  - Information provision
  - Decision making skills

## 2. Behavioral and Social Approaches

- School-based physical education (PE) curricula and policy
- Individually-adapted health behavior change
- Social support in community setting
- College-based health education and PE
- Classroom-based health education focusing on reducing television viewing and video game playing
- Family-based social support

# School-based PE curricula and policy Strongly Recommended



# Individually-adapted health behavior change programs Strongly Recommended



# Individually-adapted Health Behavior Change

- Goal setting and self-monitoring
- Building social support
- Behavioral reinforcement
- Structured problem solving
- Relapse prevention

# **Social support interventions in community settings**

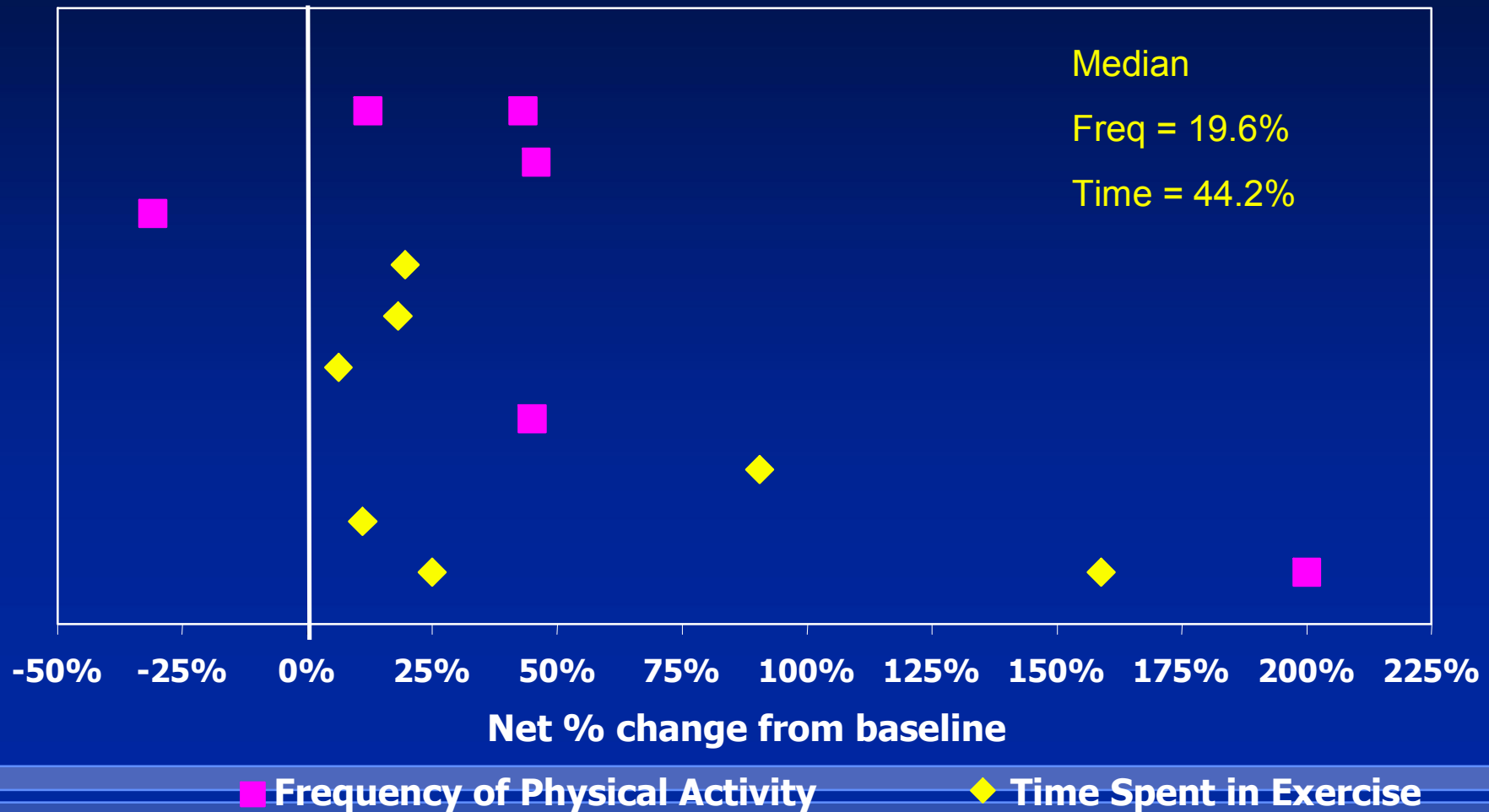
## **Strongly Recommended**



# Social Support in Community Contexts

- Creating, strengthening, and maintaining social networks
- Use of 'buddy' systems
- Contracting
- Walking groups

# Social support interventions in community settings



# Insufficient Evidence

- College-based health education and PE
- Classroom-based health education focusing on reducing television viewing and video game playing
- Family-based social support

### 3. Environmental and Policy Approaches

- Create or enhance access
- Urban planning and land use
  - Community-scale
  - Street-scale
- Transportation policies and practices

(Diverse and challenging literature for urban planning & transportation)

Creation of or enhanced access to  
places for PA

Strongly Recommended



# Creation and/or enhanced access to places for physical activity

- Built environment - trails and/or facilities access
- Reducing barriers - safety, affordability
- Training & incentives
- Site-specific programs

# Urban (city) design & land use approaches

- Community-scale changes
  - More residents living within walking distance of shopping, work, and school
  - Improved connectivity of streets and sidewalks
  - Preserve or create green-space and improve aesthetic qualities of the built environment

# Strongly recommended

- Community-wide campaigns
- School-based PE curricula and policy
- Individually-adapted health behavioral change
- Social support interventions in community settings
- Create or enhance access

## Recommended

- Point-of-decision prompts

# Insufficient evidence

- Mass media campaigns
- Classroom-based Health education
- TV/video game turn off
- College-age health education and PE
- Family-based social support

# Under Review

- Urban design: community scale
- Urban design: street scale
- Transportation policy

Also whole set of diabetes self-management recs + research questions

- R. Glasgow helped to coordinate

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[www.thecommunityguide.org](http://www.thecommunityguide.org)

# Findings Can be Applied at Every Level of a Community

## *Community-based organizations:*

- Encourage selection of appropriate options for local context
- Tailor to local needs

## *Researchers:*

- Use “insufficient evidence” findings to focus research and in proposing additional research
- Evaluate programs that work in one place in a new area

# Limits of Evidence-Based Methods

- Lack of evidence doesn't mean intervention doesn't work
- Cultural and geographical bias
  - Largely western world phenomena
  - Evidence may be a luxury in some parts of the world
- Potential bias or randomness in what is funded & studied

# Limits of Evidence-Based Methods

- Do a reasonable job of telling us “what” and “how much”
- Give less information on “how” and “why”
- At local level, what works may be the most expensive
- Community-based, participatory approaches
  - May seem counter-intuitive to an evidence-based process

# Making Sense of What Works

## Guidelines:

- Should *not* be viewed as the sole source for informed decision-making
- Are not conceptualized to address the needs of the community, cultural appropriateness, and political considerations
- Will be most useful when used in conjunction with community needs assessment and planning

# The LOCAL Spin on What Works

- Choose realistic strategies
  - Tailored to local needs
  - Balance evidence approaches with innovation/creativity
- Pursue and use local data
  - Greatly enhance likelihood of success
  - Gain local “buy in”
- Discover what drives overall trends in activity and obesity
  - Youth focuses vs. adult focused

# Resources to Enhance Decision-Making

# Some Useful Sources

- Comprehensive Review

- US Dept of Health and Human Services. *Physical Activity and Health. A Report of the Surgeon General*. Atlanta, GA: US Dept of Health and Human Services; Centers for Disease Control and Prevention; 1996.

- Ecological Models

- McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs. *Health Educ Q*. 1988;15:351-377.
- Sallis JF, Owen N. Ecological models. In: Glanz K, Lewis FM, Rimer BK, eds. *Health Behavior and Health Education: Theory, Research, and Practice*. San Francisco, CA: Josey Bass Publisher; 1997:403-424.

# Some Useful Sources

- Environmental and Policy Interventions

- King AC, Jeffery RW, Fidinger F, et al. Environmental and policy approaches to cardiovascular disease prevention through physical activity: issues and opportunities. *Health Educ Q.* 1995;22:499-511.
- Sallis JF, Bauman A, Pratt M. Environmental and policy interventions to promote physical activity. *Am J Prev Med* 1998;15:379-397.

- General Intervention Effectiveness

- Theme issue: physical activity interventions. *American Journal of Preventive Medicine* November 1998.
- *Guide to Community Preventive Services*  
website: <http://www.thecommunityguide.org>

# Some Useful Sources

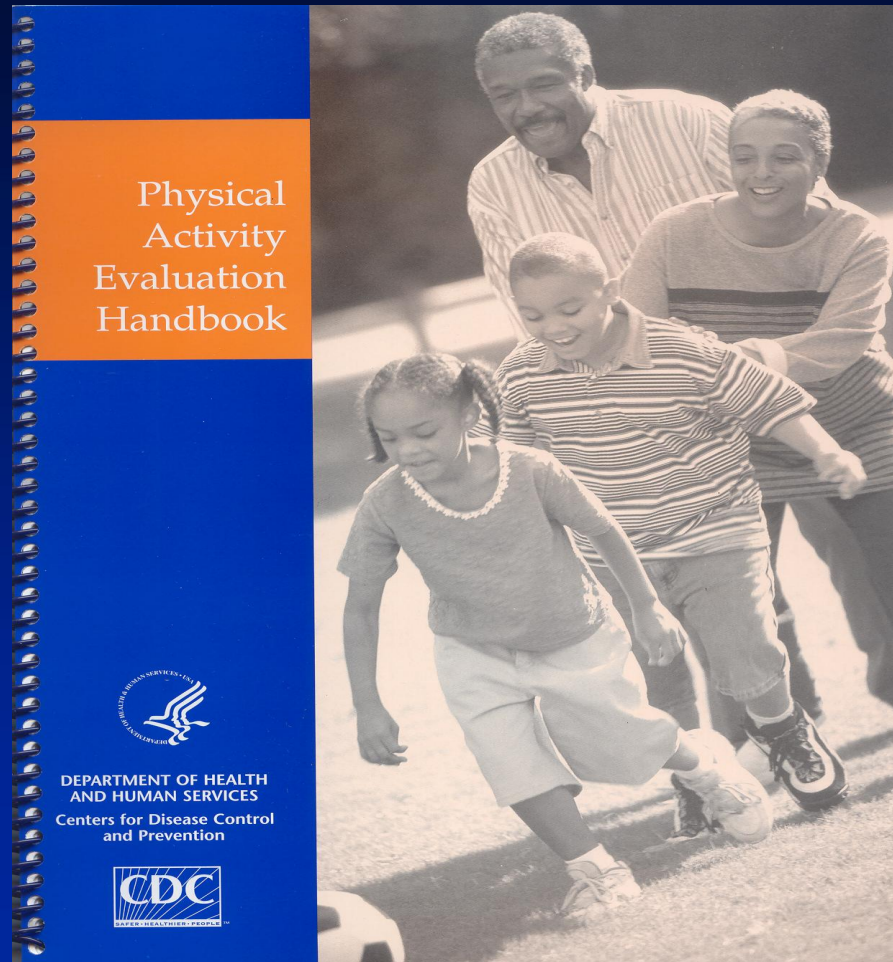
- Evidence-Based Approaches

- Brownson RC, Baker EA, Leet TL, Gillespie KN. *Evidence-Based Public Health*. New York: Oxford University Press; 2003.
- Guyatt G, Rennie D, eds. *Users' Guides to the Medical Literature. A Manual for Evidence-Based Clinical Practice*. Chicago, IL: American Medical Association Press; 2002.

- Evaluation

- Goodman, RM. Principles and tools for evaluating community-based prevention and health promotion programs. *J Public Health Manage Pract* 1998;4:37-47.
- Israel BA, Cummings KM, Dignan MB, Heaney CA, Perales DP, Simons-Morton BG, Zimmerman MA. Evaluation of health education programs: current assessment and future directions. *Health Educ Q* 1995;22:364-389.

# Resources to Enhance Decision-Making



Free on CDC website ([www.cdc.gov](http://www.cdc.gov))

<i>"Watershed" event</i>	<i>Year</i>	<i>Public Health Intervention</i>	<i>Year</i>
Papanicolaou test perfected	1943	Screening programs for cervical cancer established in all state health departments	1995
US Surgeon General's Advisory Committee concludes that smoking causes disease	1964	Statewide tobacco control programs established in all states	1993
US Surgeon General's report on physical activity	1996	Statewide physical activity promotion programs established in all states	--



# Wendy's

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# Contact Information

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