Today

- Health beliefs, health behaviors, and behavior change
  - Addictive behaviors
  - Eating behavior, exercise behavior
  - MHBC, motivational interviewing

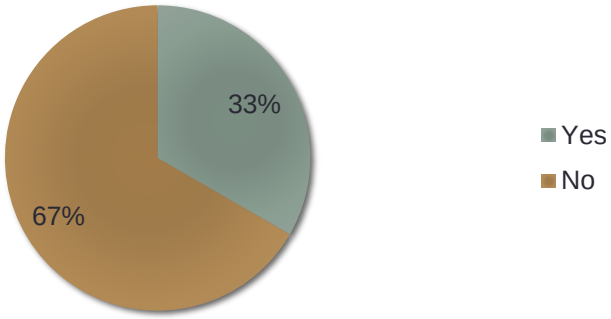
What are health behaviors?

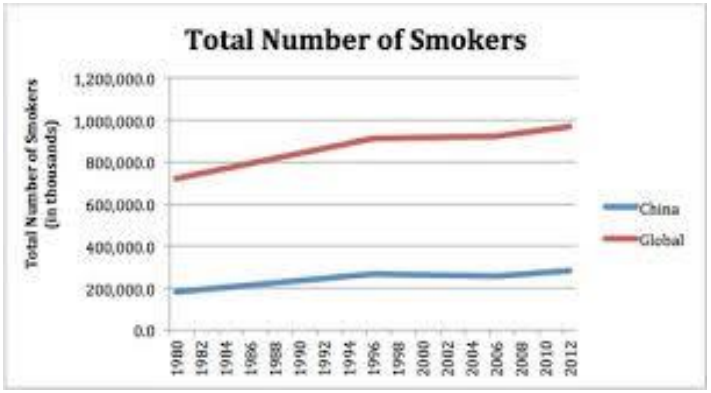
Kasl and Cobb (1966)	
Health behavior	Behavior aimed to prevent disease (e.g., eating a healthy diet)
Illness behavior	Behavior aimed to seek remedy (e.g., to the doctor)
Sick role behavior	Activity aimed at getting well (e.g., taking prescribed medication)

Matarazzo (1984)	
Health-impairing habits	Behavioral pathogens (e.g., smoking, eating a high fat diet)
Health protective behaviors	Behavioral immunogens (e.g., attending a health check)

Smoking

- Smoking behavior is on the decline but decrease I greater in men than in women
- Smokers tend to be in the unskilled manual group
- Smokers tend to earn less than non-smokers
- Two-thirds of smokers report wanting to give up smoking
- 58% of smokers say that it would be fairly/very difficult to go without smoking for a whole day





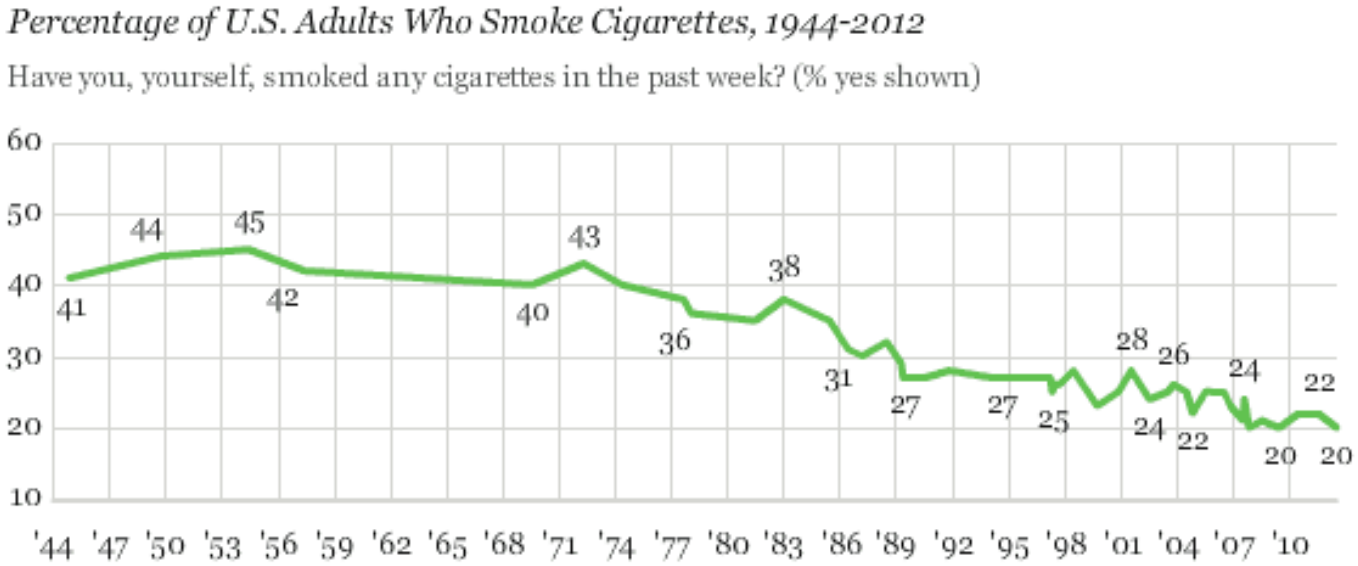
Components of cigarettes

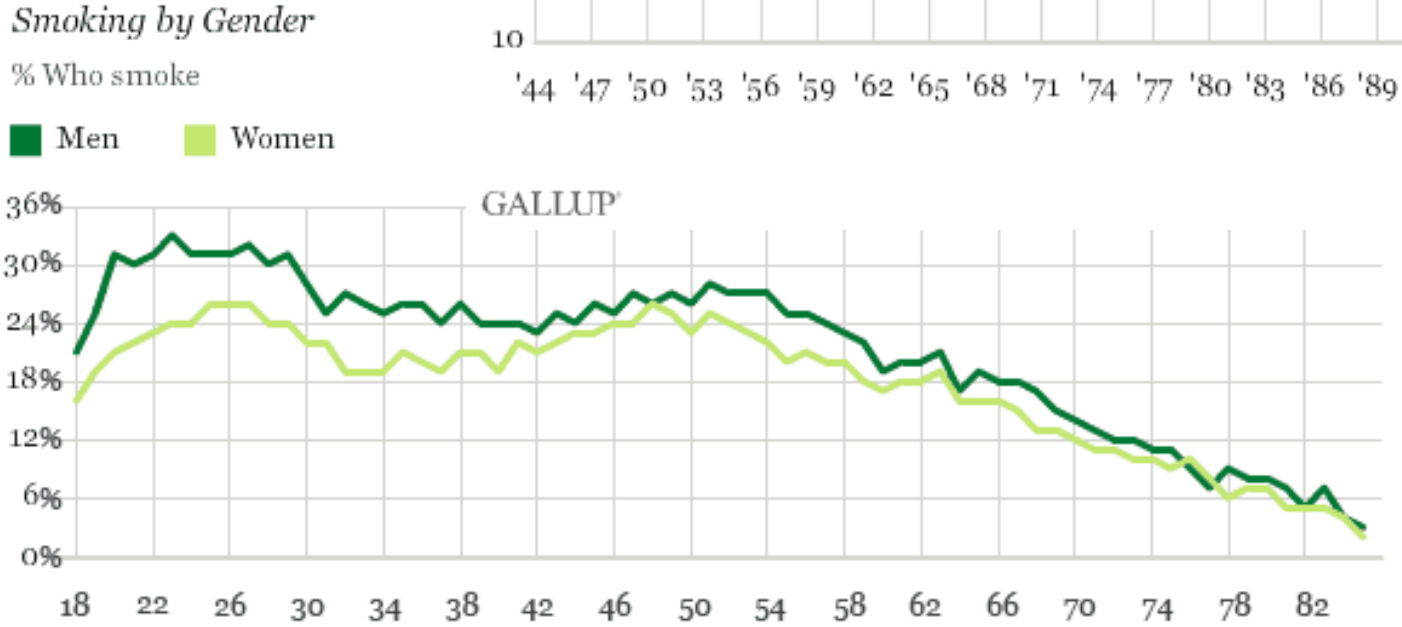
- Nicotine
  - Primary addictive substance, pleasurable
  - Acts directly on CNS
- Tars
  - Chemicals which are carcinogenic
- Carbon Monoxide (CO)
  - CO reduced amount of O2 in blood and places strain on heart muscle

Smoking and Health

- Smoking is the greatest single cause of preventable deaths (> 20% of all deaths)
  - Half of those who smoke throughout their life will die as a direct result of their habit
  - Half of these deaths will occur in middle age with an average of 21 years of life lost
  - The rest will occur in old age, with around 8 years lost
  - Average reduction of life expectancy = 5-9 years
  - Smoking contributes to…
    - Heart disease
    - Cancer
    - Stroke
    - Influenza and pneumonia
    - Chronic bronchitis
    - Emphysema
    - Peptic ulcers
    - Respiratory disorders
    - Lower birth weight in offspring

Smoking - USA

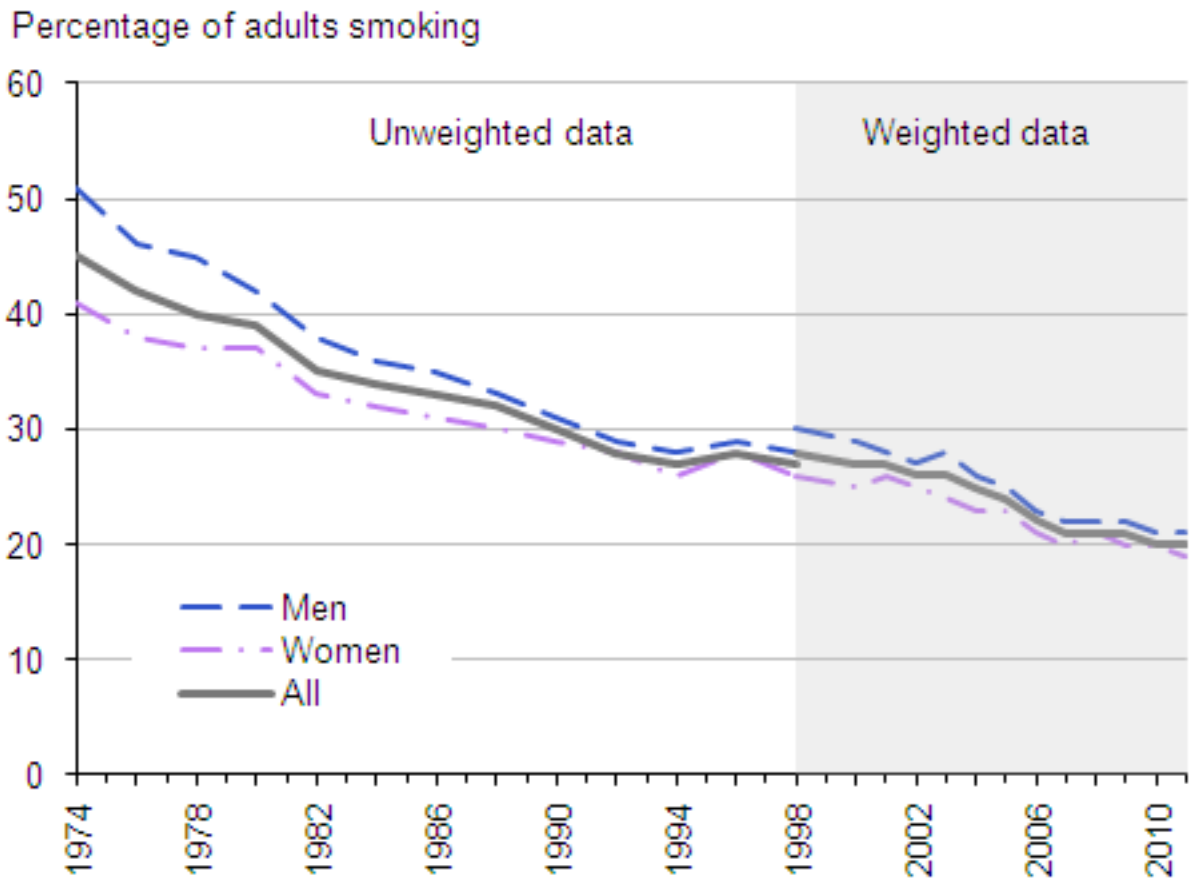




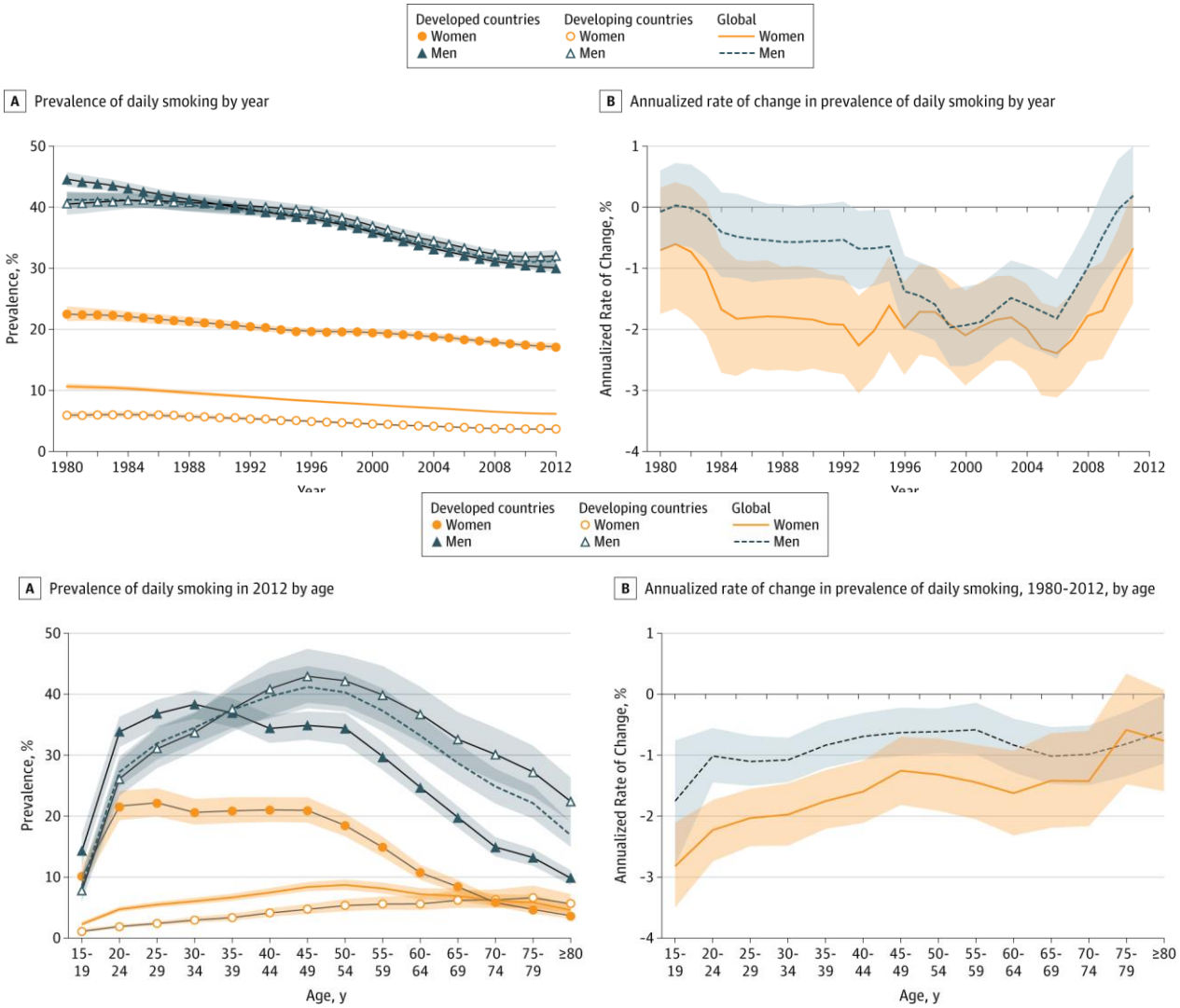
2009
Gallup-Healthyways Well-Being Index

GALLUP

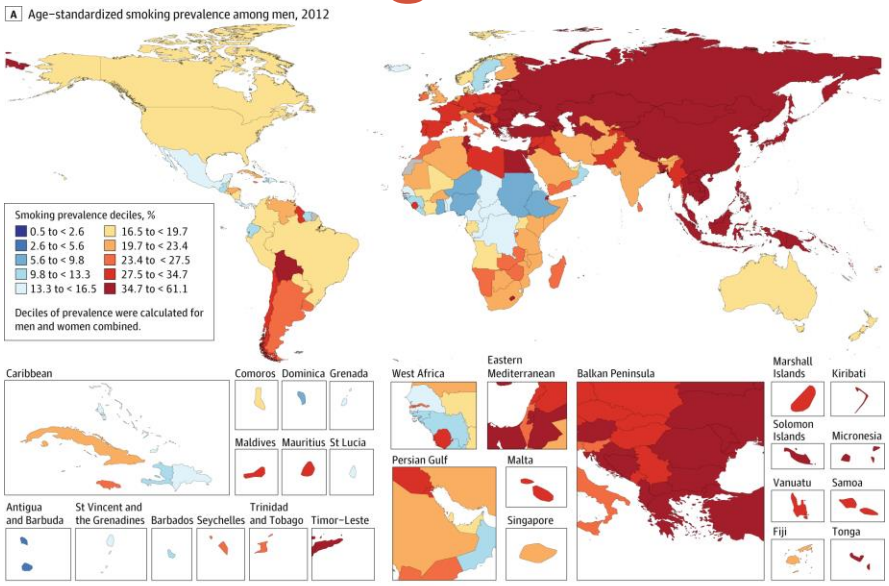
Smoking - UK

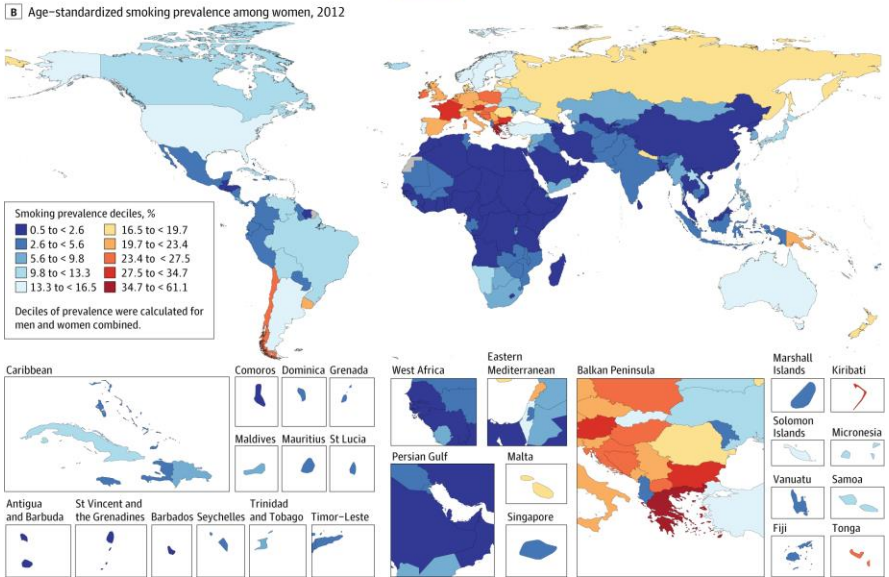

Percentage of adults smoking
60
50
40
30
20
10
0
Unweighted data
Weighted data
Men
Women
All
1974
1978
1982
1986
1990
1994
1998
2002
2006
2010

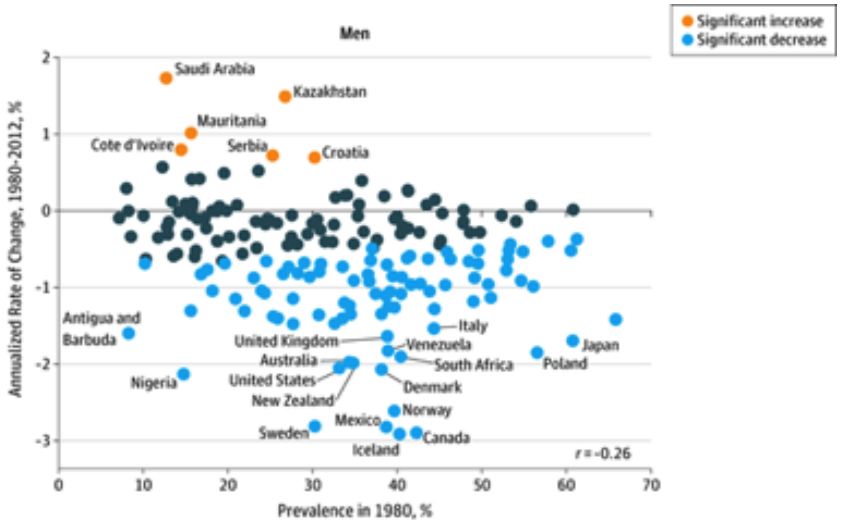
Smoking – Global (Ng et al., JAMA, 2014)

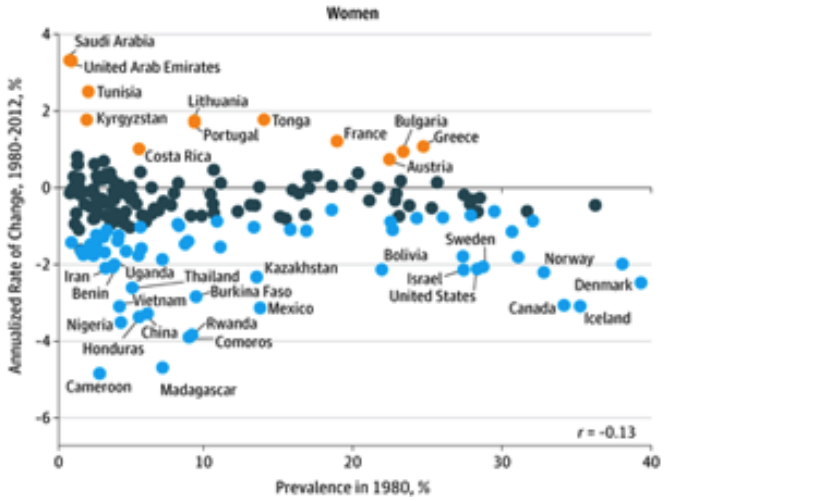


Smoking – Global (Ng et al., JAMA, 2014)









Why do people smoke?

- Start
  - Social learning (modeling)
  - Peer pressure
    - 95% begin in teen years
    - Know smoking is dangerous but say will stop
- Continue
  - Genetic (?)
  - Dependence (nicotine-regulation)
  - Reinforcement (peers, feeling good, performance)

Treatments for Smoking

- Nicotine-replacement therapy
- Aversion therapies
- Self-management strategies
- Multi-modal approaches

Relapse rate = 70-80% after 1 year

- Factors
  - Abstinence-violation effect
  - Weight gain (2 pounds)
  - Social support
  - Intrinsic motivation (better than extrinsic)
  - Stress

Helping Smokers

- 5 As (willing to quit)
  - Ask about tobacco use
  - Advise to quit
  - Assess willingness to make a quit attempt
  - Assist in quit attempt
  - Arrange follow-up
- 5 Rs (unwilling to quit)
  - Relevance
  - Risks
  - Rewards
  - Roadblocks
  - Repeat

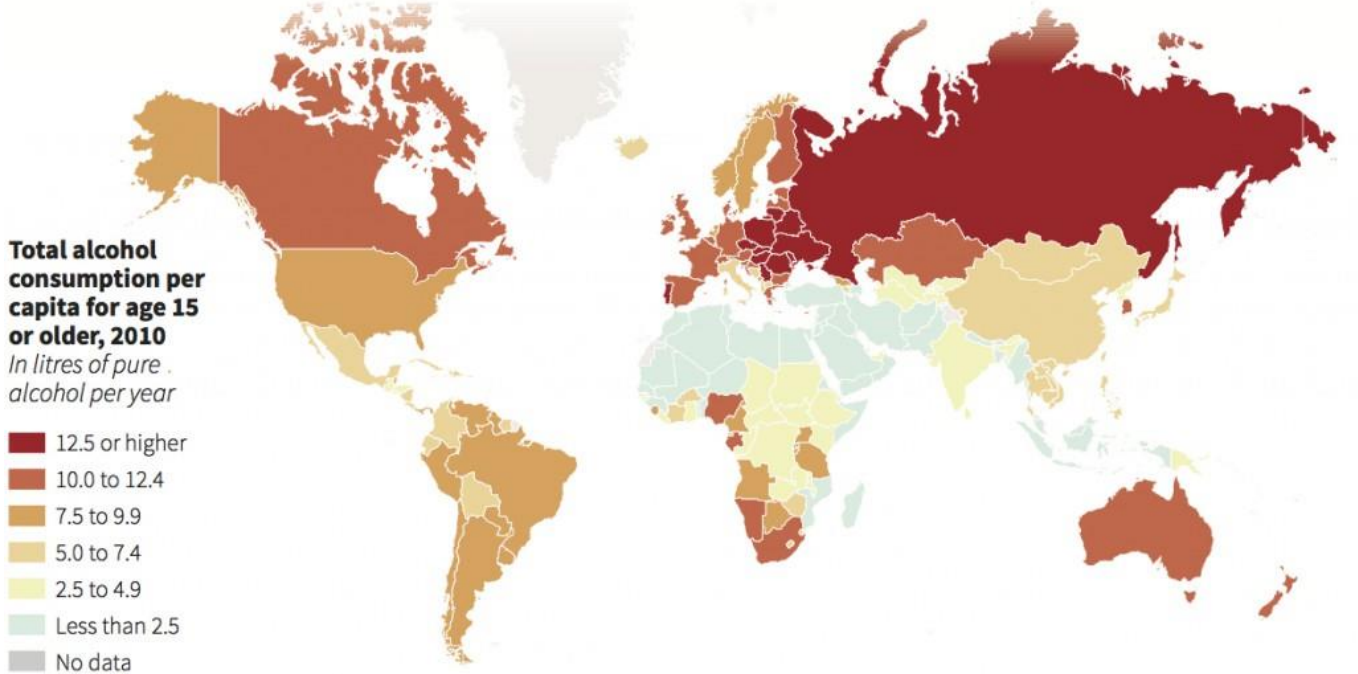
Alcohol Consumption

- The majority of adults have drunk alcohol in the past year
- Men are more likely to drink alcohol than women
- Men are more likely to have drunk on five or more days in the past week than women
- Men aged 16-24 drink the most
- There are no sex differences in the 24-35 age range
- About 70% of adults drink alcohol at least occasionally
  - about 10% are ‘problem drinkers’ (health damage)
  - About 5% are ‘alcoholic’ (alcohol dependence)
- Two vulnerable times
  - Teenage years
  - Late middle age

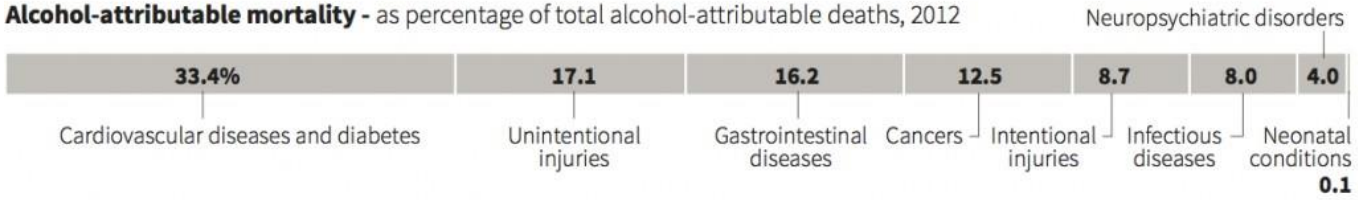
Alcohol Consumption - Global

World alcohol consumption

More than 3 million people died from alcohol consumption in 2012, for reasons ranging from cancer to violence, the World Health Organisation said as it called on governments to do more to limit the damage.



Alcohol-attributable mortality - as percentage of total alcohol-attributable deaths, 2012

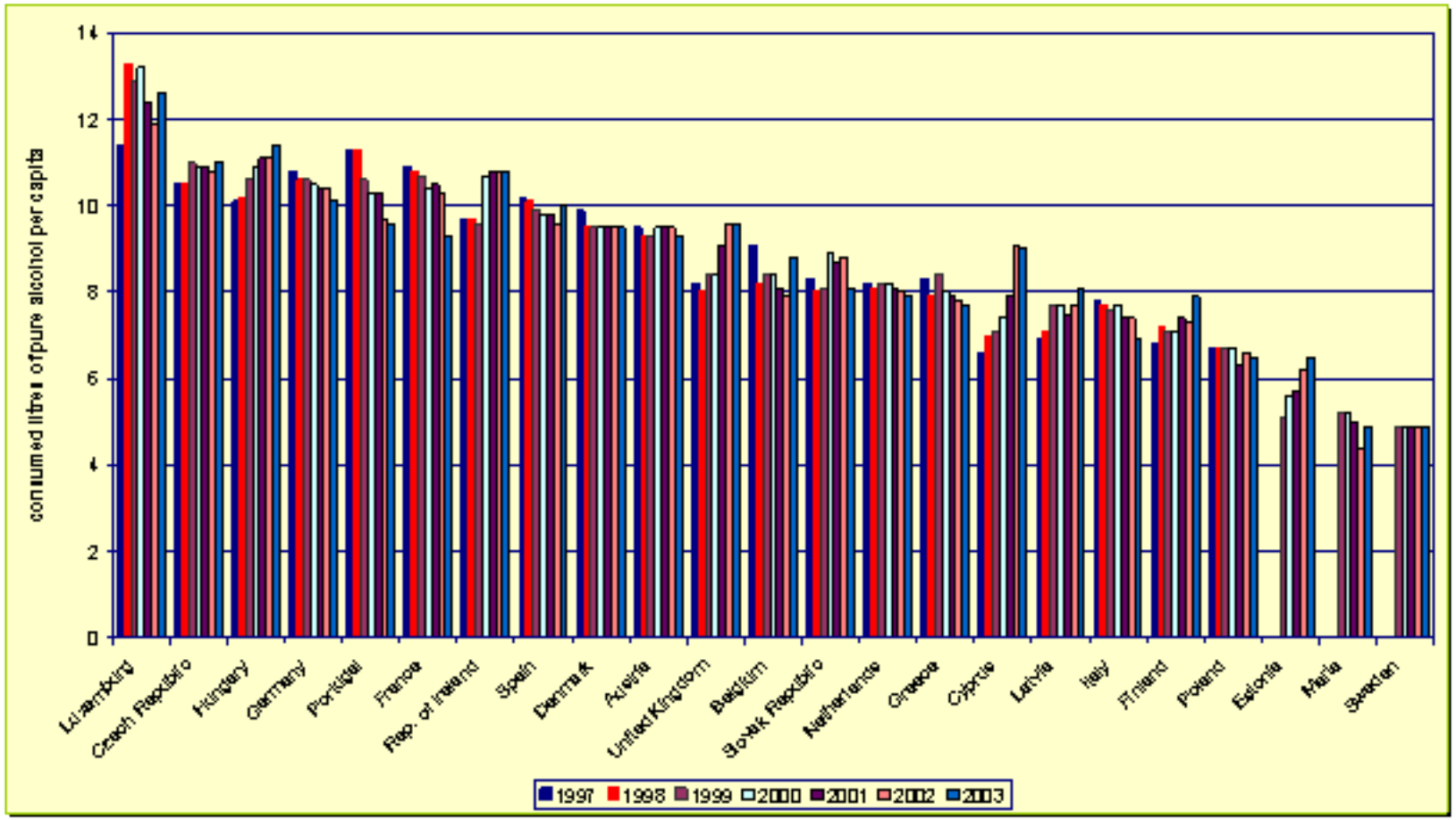


Source: Global status report on alcohol and health 2014, World Health Organisation

R. Carrera 13/05/2014

REUTERS

Alcohol Consumption - EU



Why do people drink?

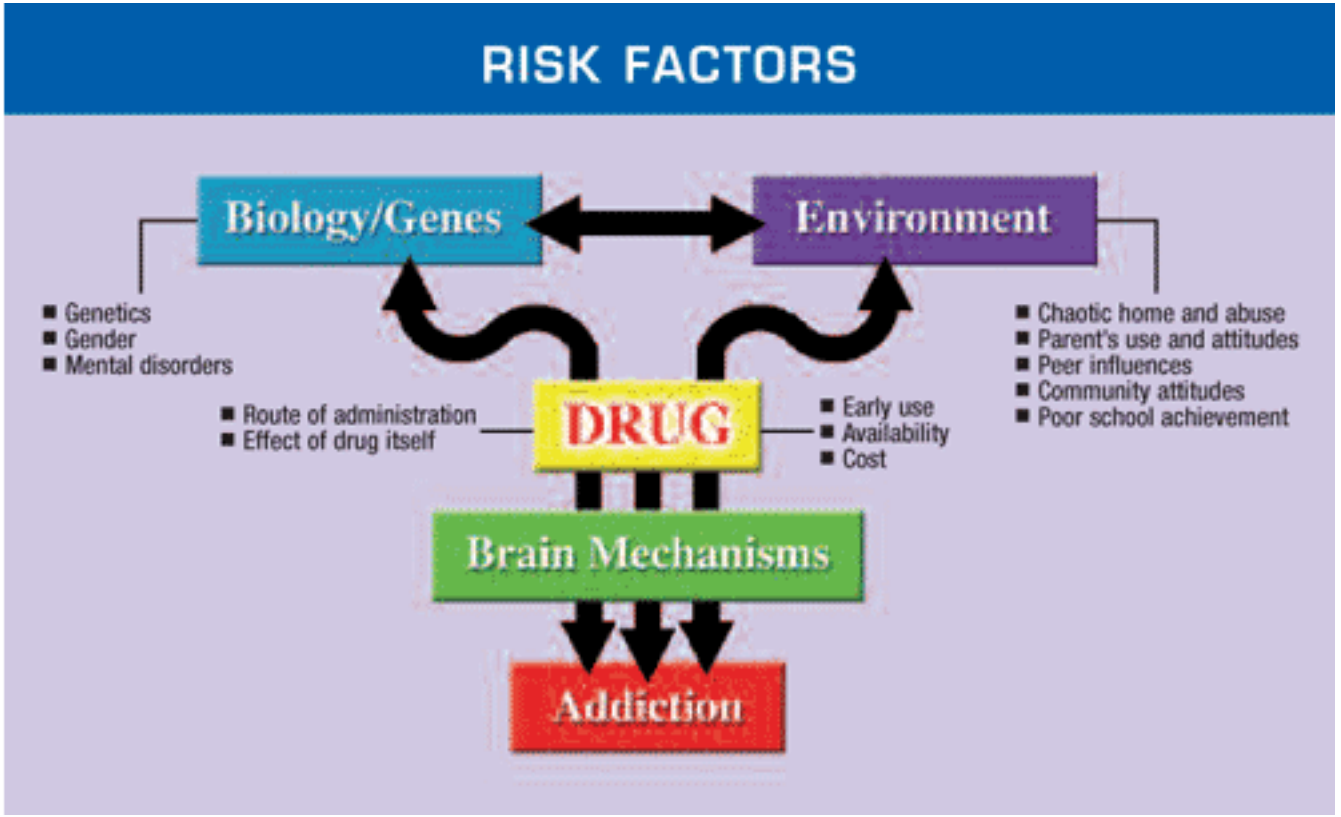
- Start
  - Social learning (modeling)
  - Peer pressure
- Continue
  - Dependence
  - Reduce social anxiety
  - Tension relief
  - Reinforcement

Addictive Behavior

- Psychological theories
  - Social learning perspective
    - (1) classical conditioning; (2) operant conditioning; (3) observational learning; (4) cognitive processes
- Biological theories
  - Disease perspective
    - Addiction
- Social theories
  - Social reinforcement
  - Social identity

Addictive Behavior

- Results of the interaction of person factors and the environment

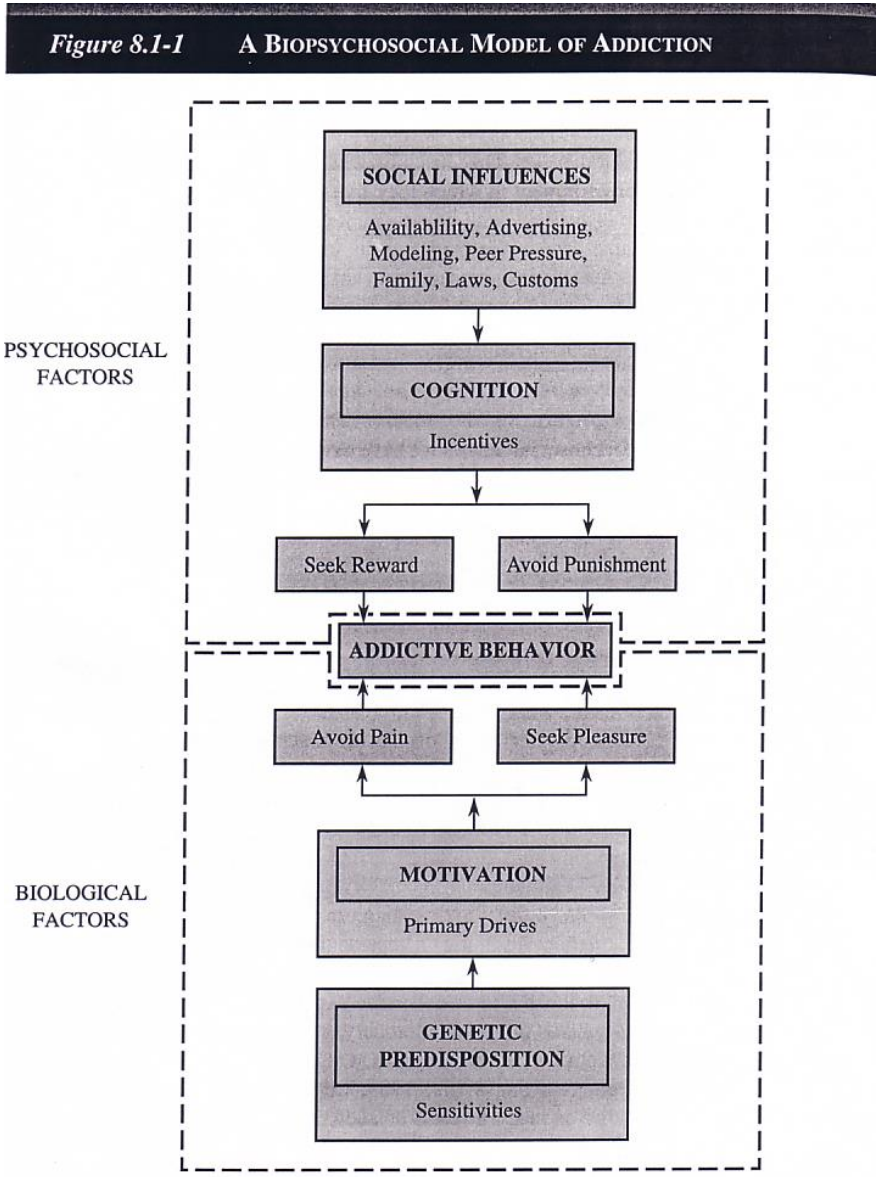


https://www.drugabuse.gov/publications/drugs-brains-behavior-science-addiction/drug-abuse-addiction

Addictive Behavior

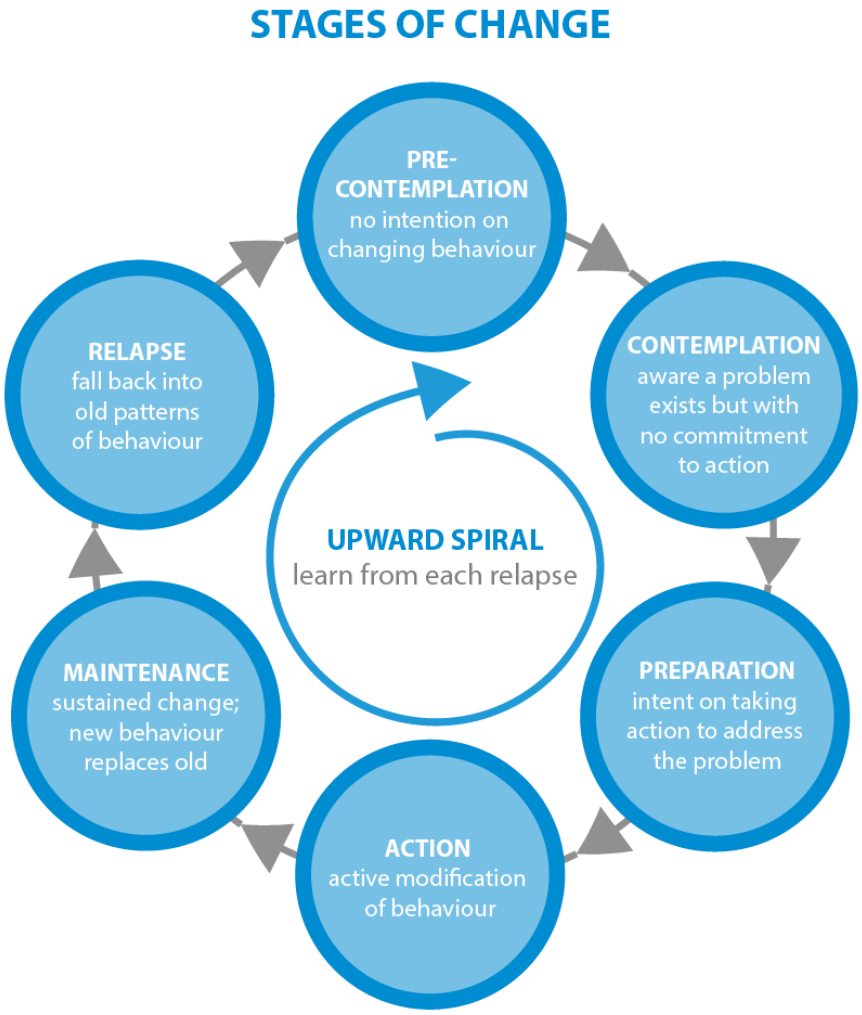
Treatments for Alcohol Abuse

- Detoxification
- Alcoholics Anonymous
- Psychotherapy
- Aversion therapies



Addictive Behavior

- Stage-based models used widely in addiction treatment programs
- Relapse prevention and coping strategies key parts of addiction treatment programs



MOST

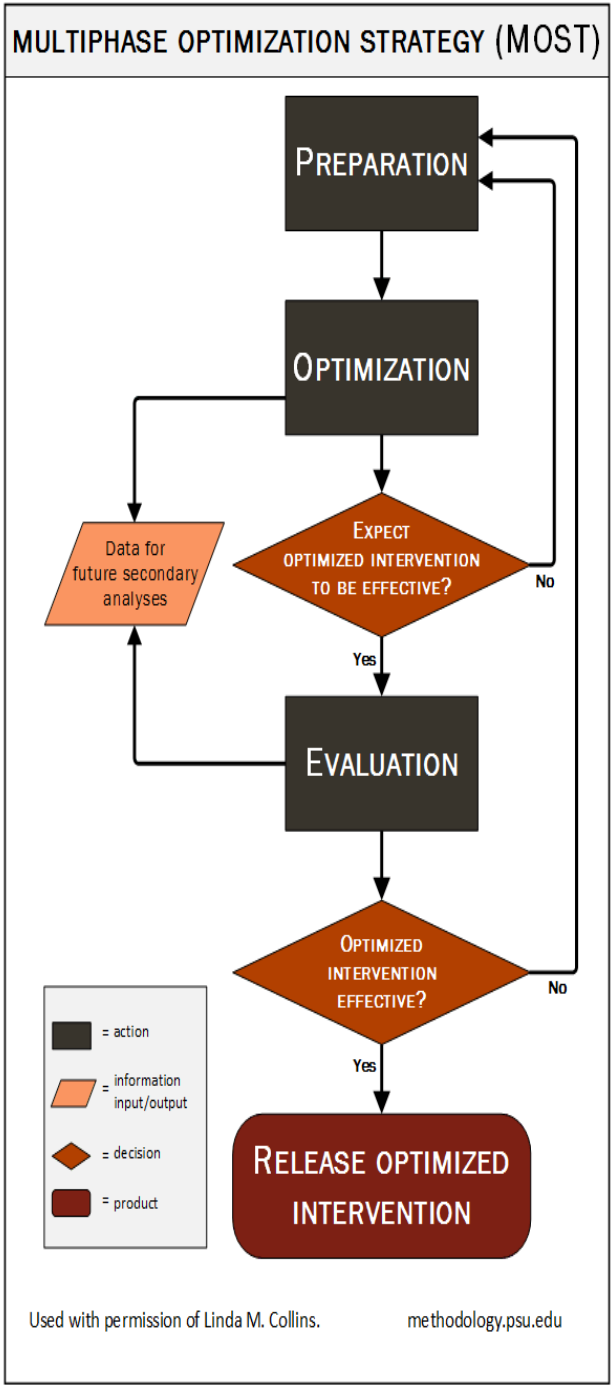
- **M**ultiphase **O**ptimization **ST**rategy
- Inspired by engineering principles
- Framework for development, optimization, and evaluation of behavioral/biobehavioral interventions (BBIs)
- Desiging BBIs that meet cirteria for
  - ***Effectiveness*** (does it do more good than harm?)
  - ***Efficiency*** (does it avoid waisting time, money, and other valuable resrouces?)
  - ***Economy/Scalability*** (does it offer a good value and can it be implemented widely with fidelity?)
  - ….that is *optimization criteria*

Collins LM, Murphy SA, Nair VN, Strecher VJ. Ann Behav Med. 2005 Aug;30(1):65-73.
www.methodology.psu.edu

MOST

- Which combination of intervention components is the most effective?
  - Content
  - Adherence
  - Fidelity
- Factorial or fractional factorial experiments
  - Main effects
  - Interaction/synergistic effects

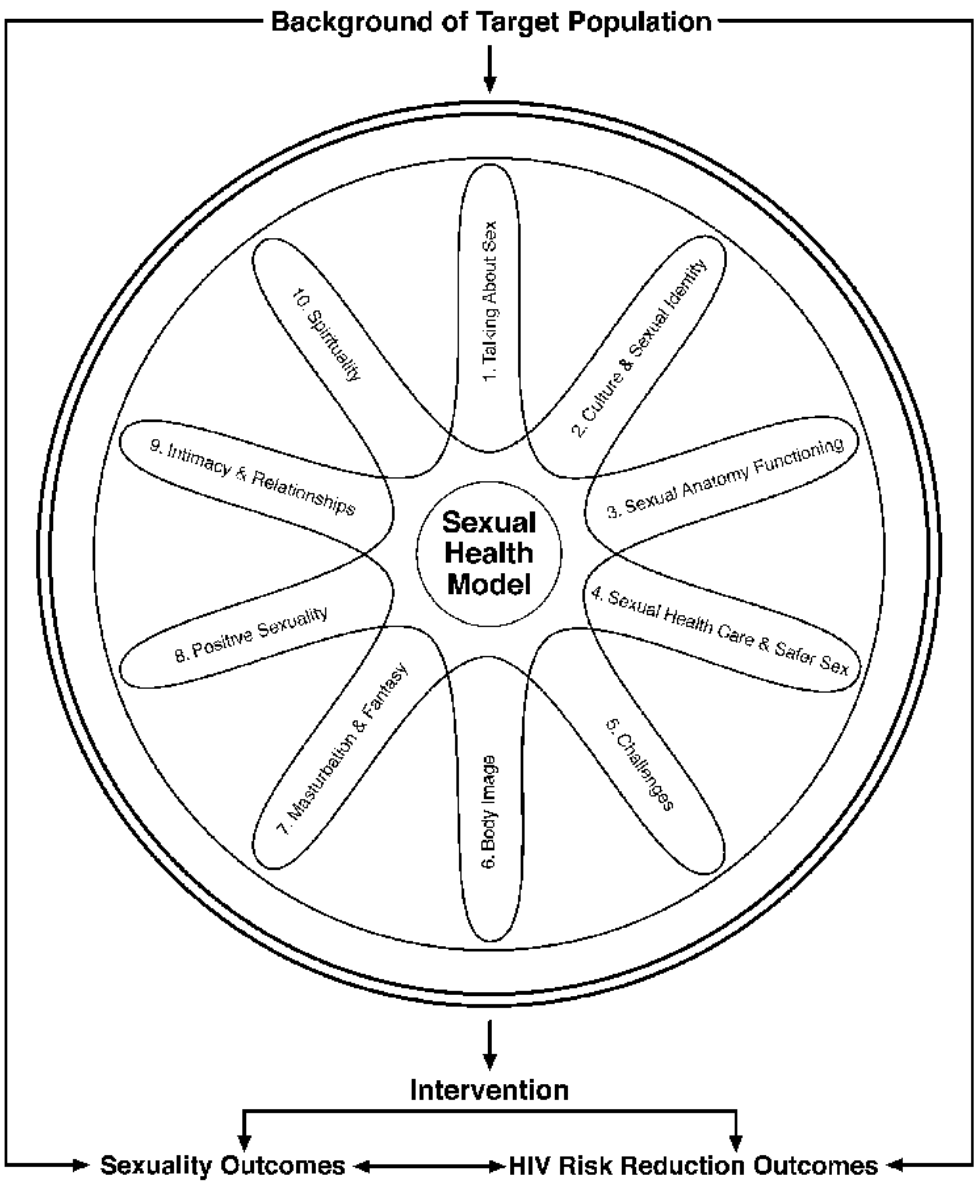
Figure 1.



Collins LM, Murphy SA, Nair VN, Strecher VJ. Ann Behav Med. 2005 Aug;30(1):65-73.
www.methodology.psu.edu

Sexual Behavior

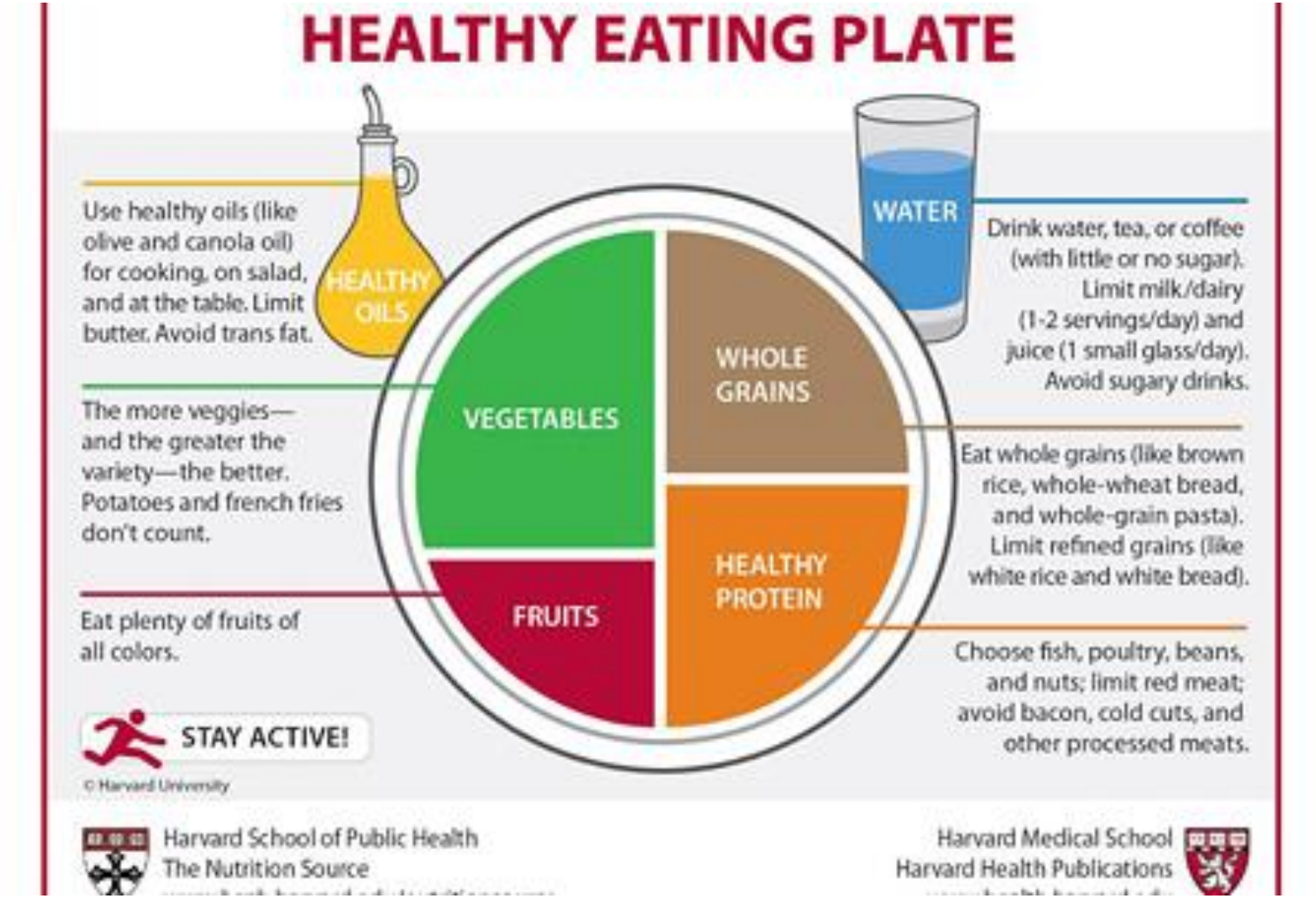
- Discussion about sexual behavior has evolved from focus on its biological functions, to focus on pleasure, to focus on sex as risk behavior for STDs and unplanned pregnancy
- Challenging behavior to study because it involves
  - Intrapersonal factors
  - Interpersonal factors
    - Sex as interaction; role negotiation
  - Situational factors



Robinson et al. (2002)

Physical Activity and Diet

Diet

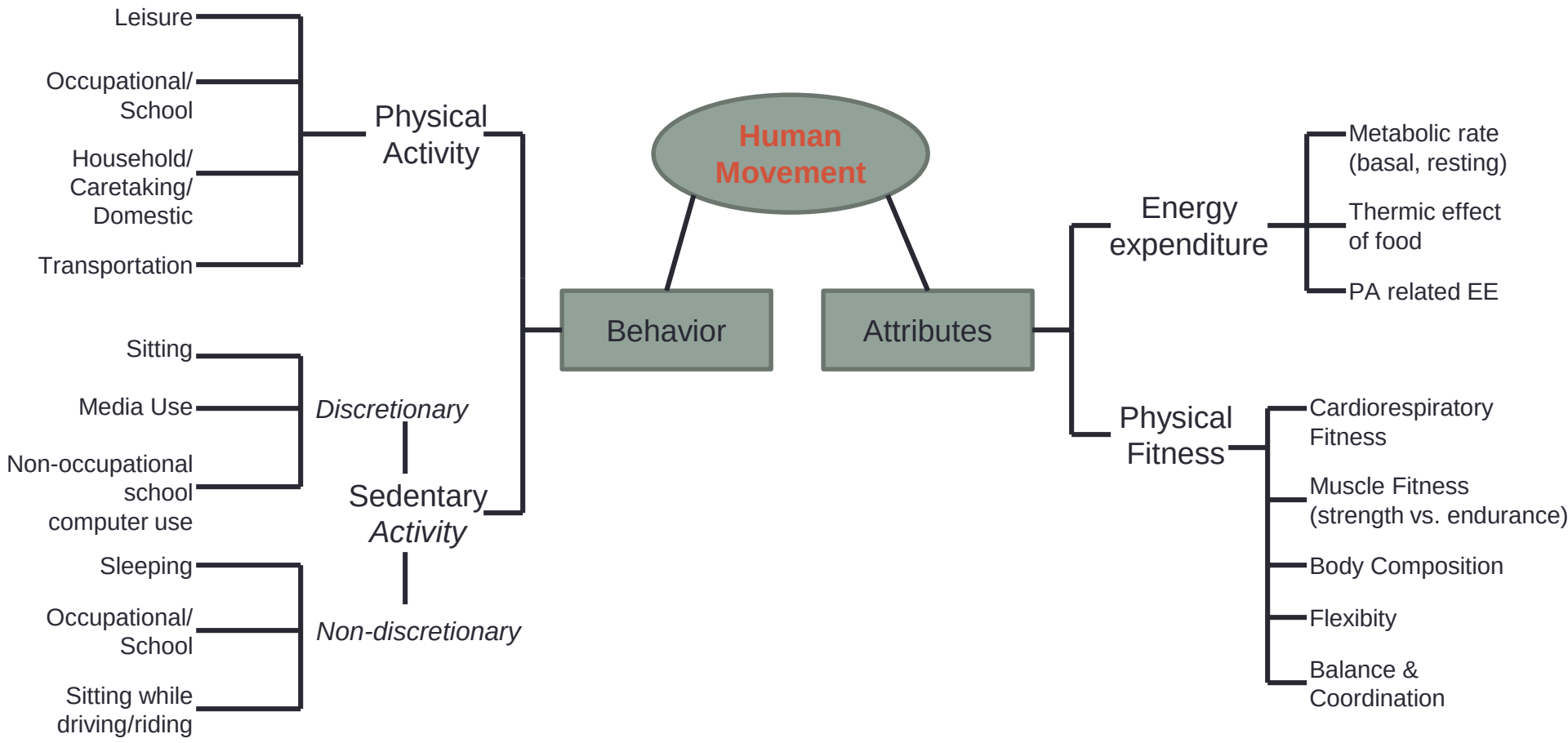

HEALTHY EATING PLATE
Use healthy oils (like olive and canola oil) for cooking, on salad, and at the table. Limit butter. Avoid trans fat.
HEALTHY OILS
WATER
Drink water, tea, or coffee (with little or no sugar). Limit milk/dairy (1-2 servings/day) and juice (1 small glass/day). Avoid sugary drinks.
The more veggies—and the greater the variety—the better. Potatoes and french fries don't count.
VEGETABLES
WHOLE GRAINS
Eat whole grains (like brown rice, whole-wheat bread, and whole-grain pasta). Limit refined grains (like white rice and white bread).
Eat plenty of fruits of all colors.
FRUITS
HEALTHY PROTEIN
Choose fish, poultry, beans, and nuts; limit red meat; avoid bacon, cold cuts, and other processed meats.
STAY ACTIVE!
© Harvard University
Harvard School of Public Health
The Nutrition Source
Harvard Medical School
Harvard Health Publications

Diet

- Factors impacting eating behavior
  - Exposure
  - Social learning (peers, parents, media)
  - Associative learning (rewarding eating behavior, food as reward)
  - Parental control
- Theories of eating behavior (TPB, SCT)
- Weight preoccupation, body dissatisfaction and body image
- Dieting vs. Overeating
- Intense debate over the most appropriate diet

Physical Activity

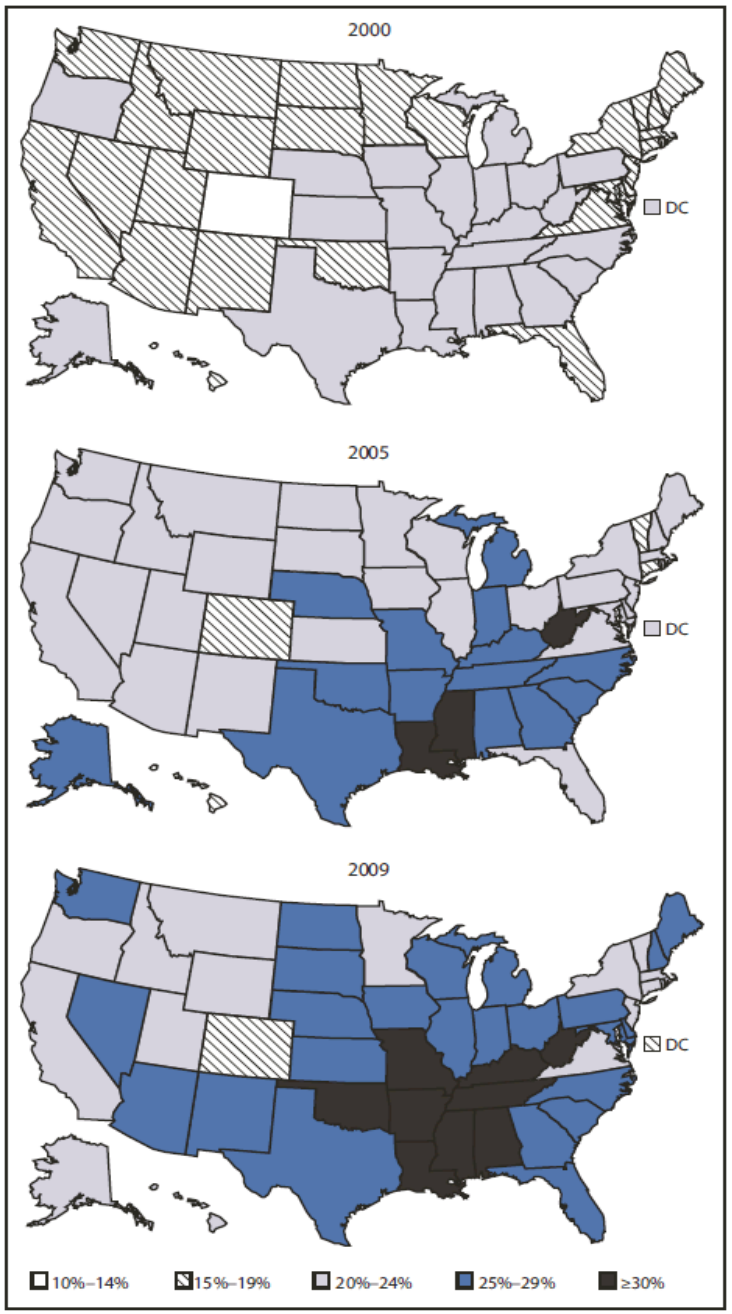
Conceptual Human Movement Framework

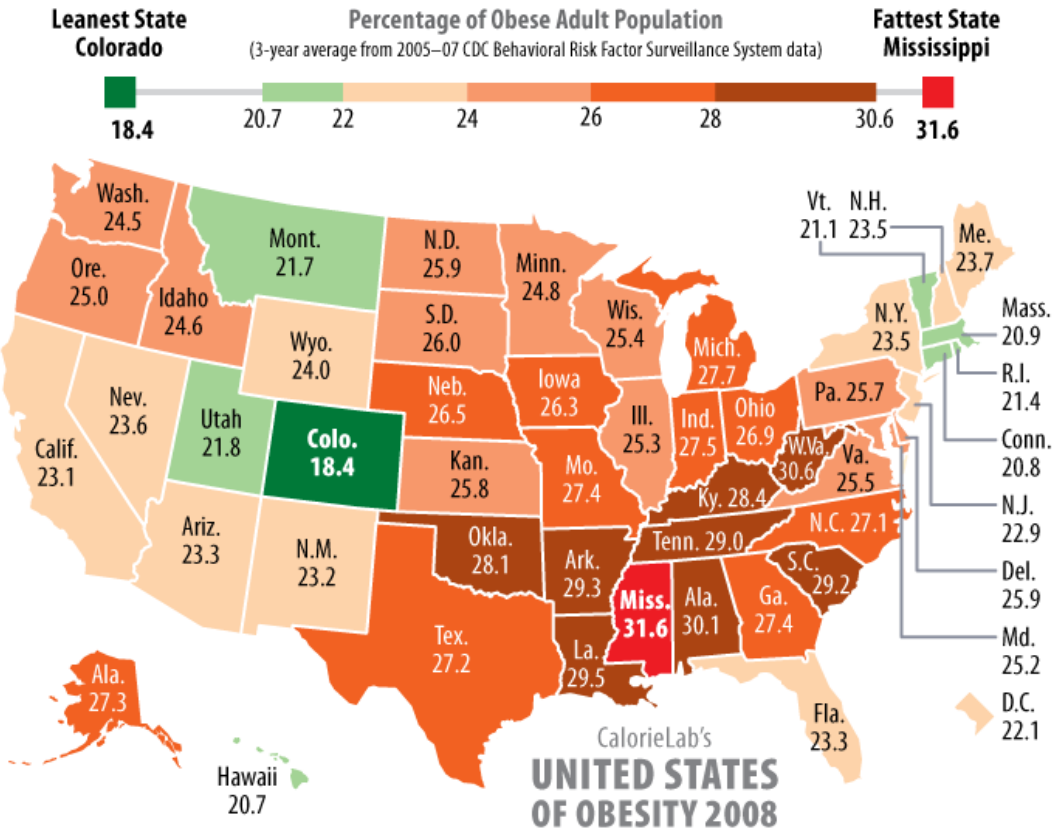


Pettee & Morrow (2010). Measurement of Active and Sedentary Behaviors: Closing the Gaps in Self-report Methods. NIH, Bethesda MD (July 21, 2010).

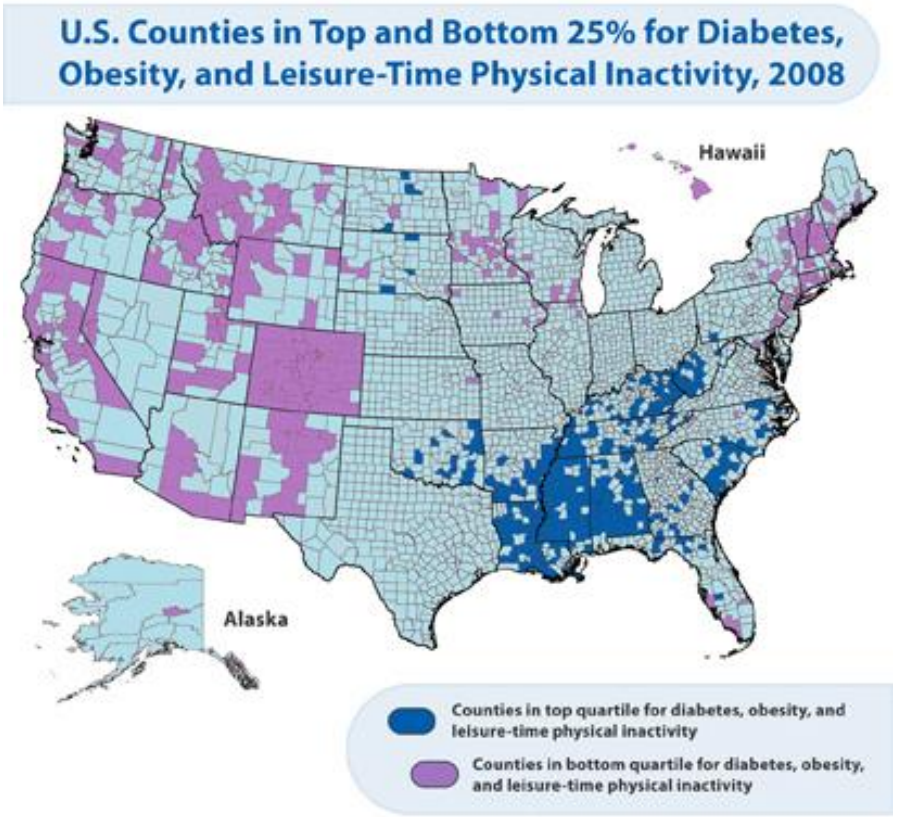
Obesity Prevalence Among U.S. Adults

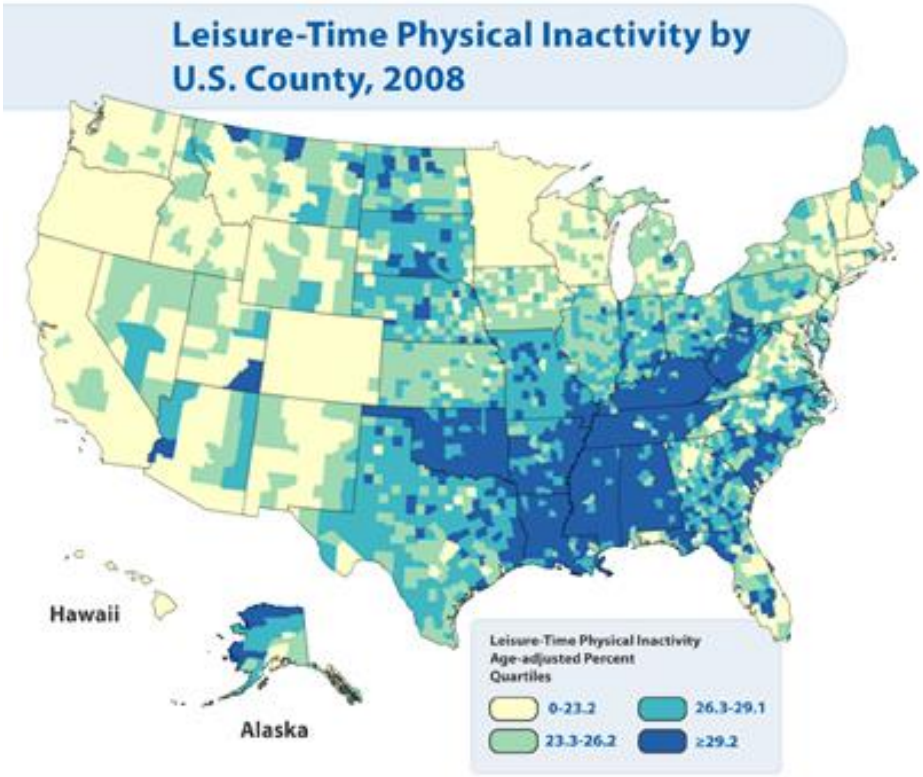
BRFSS, 2000, 2005, 2009





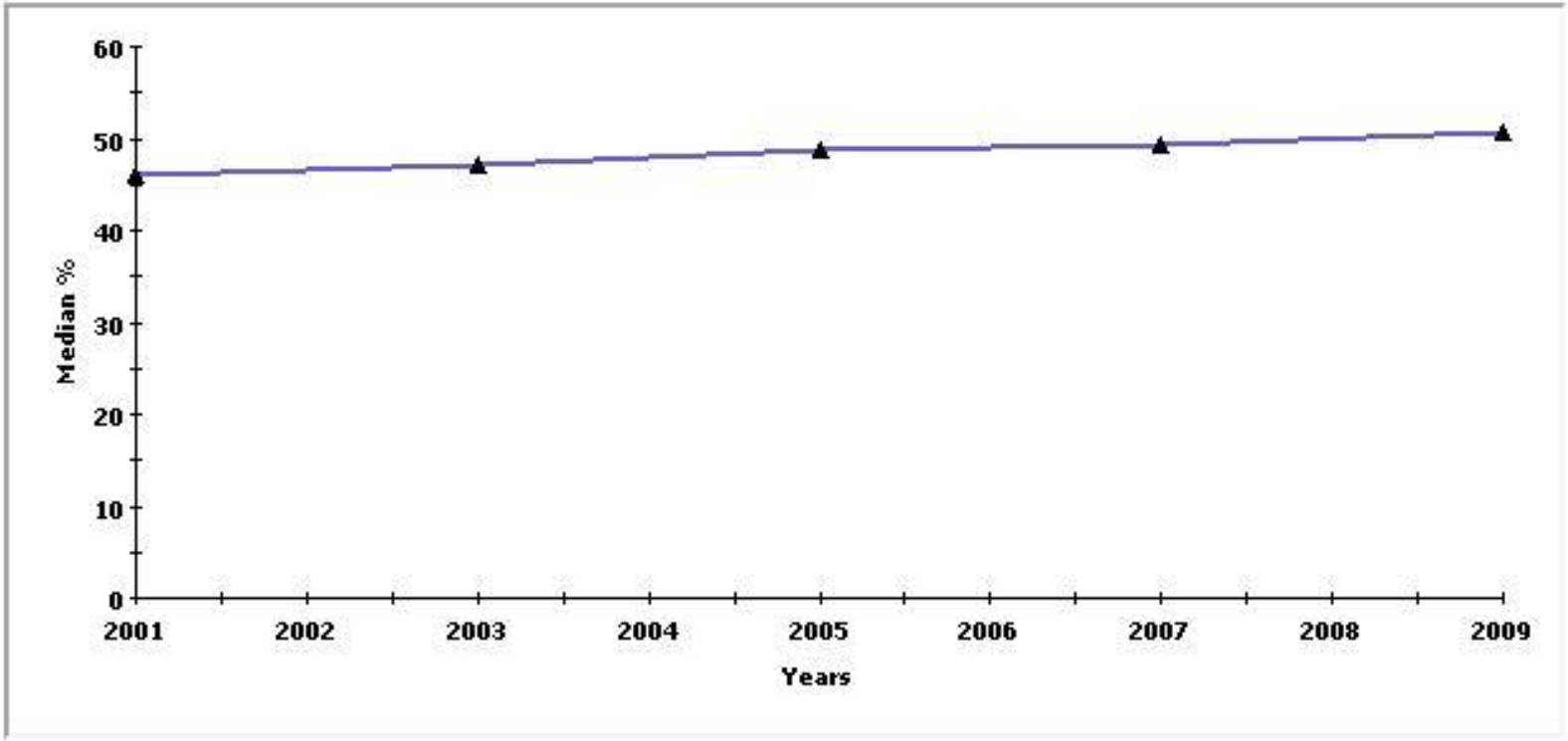
Can physical activity save us from the obesity epidemic?





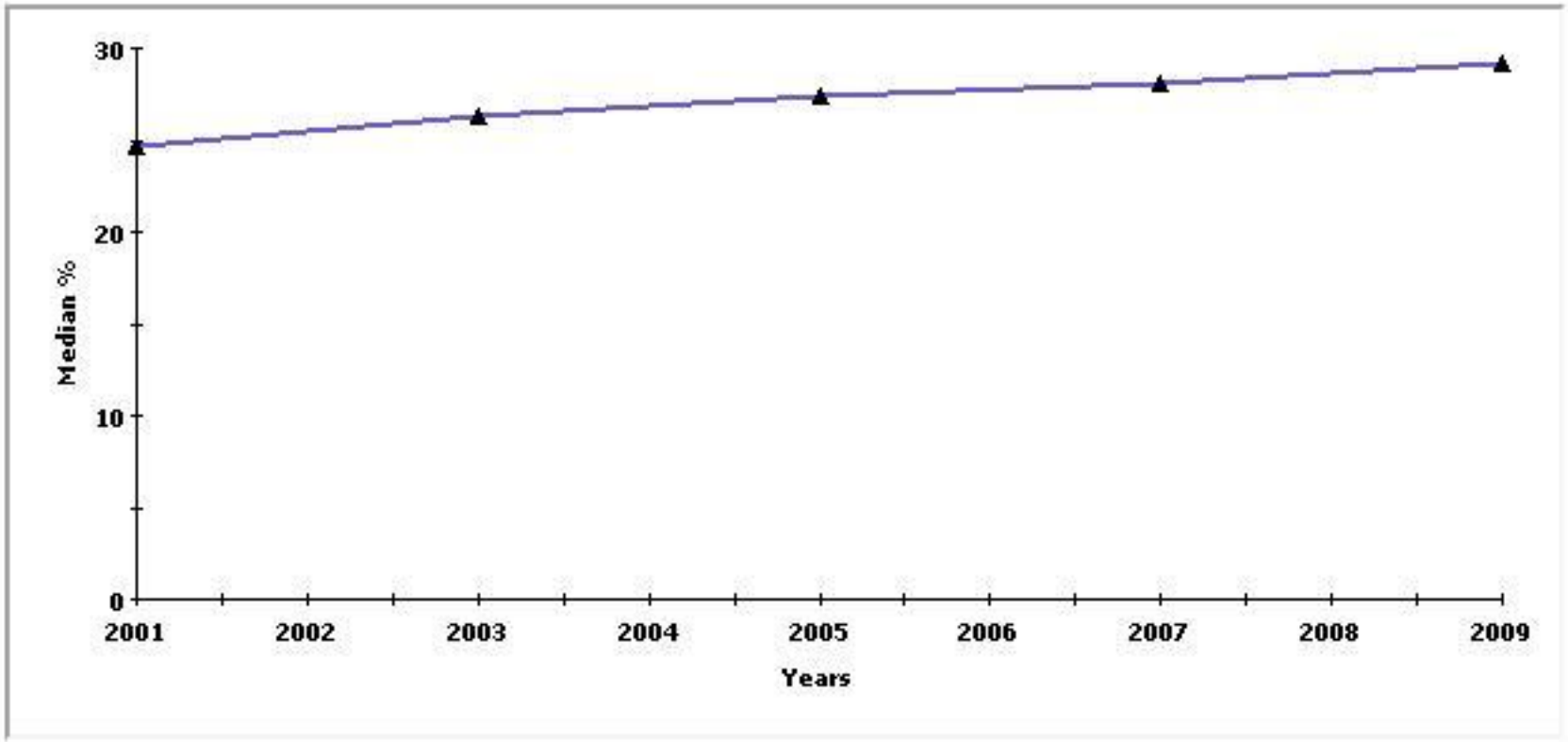
Content source: [National Center for Chronic Disease Prevention and Health Promotion, Division of Diabetes Translation]

Moderate physical activity
Nationwide (States, DC, and Territories) - All Available Years
Response = Yes



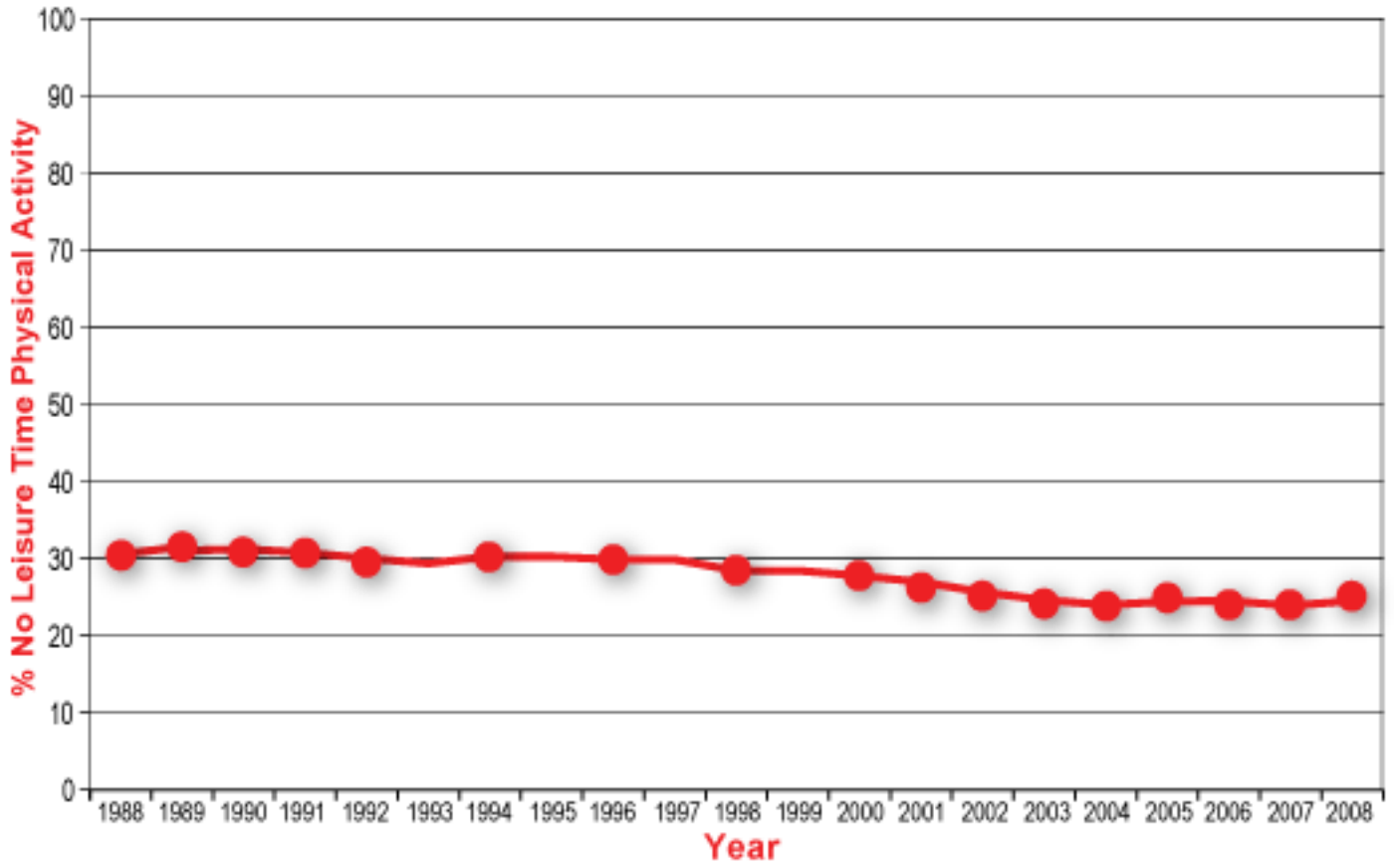
National Center for Chronic Disease Prevention & Health Promotion
Behavioral Risk Factor Surveillance System

Vigorous physical activity
Nationwide (States, DC, and Territories) - All Available Years
Response = Yes



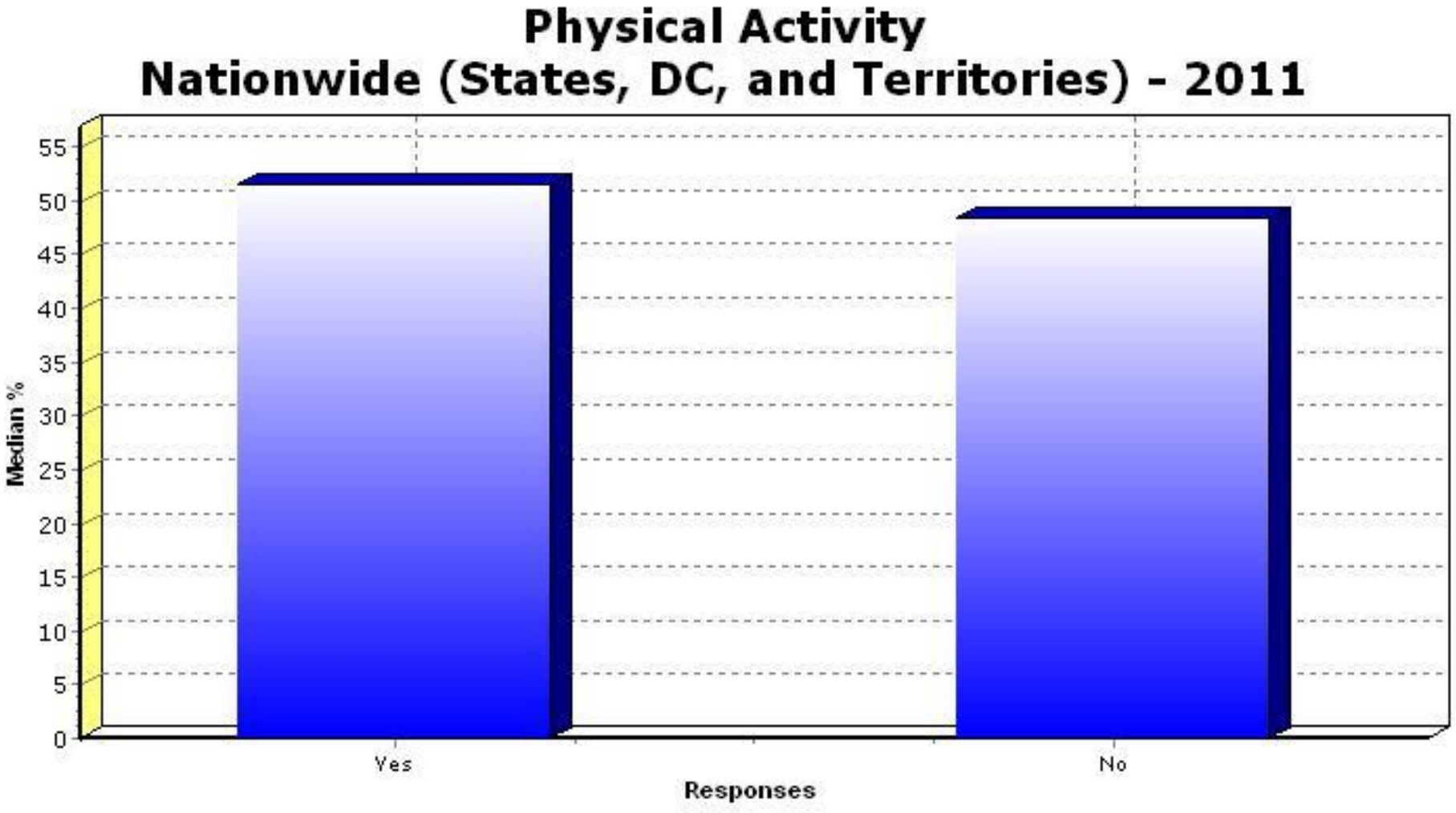
National Center for Chronic Disease Prevention & Health Promotion
Behavioral Risk Factor Surveillance System

1988–2008 No Leisure-Time Physical Activity Trend Chart



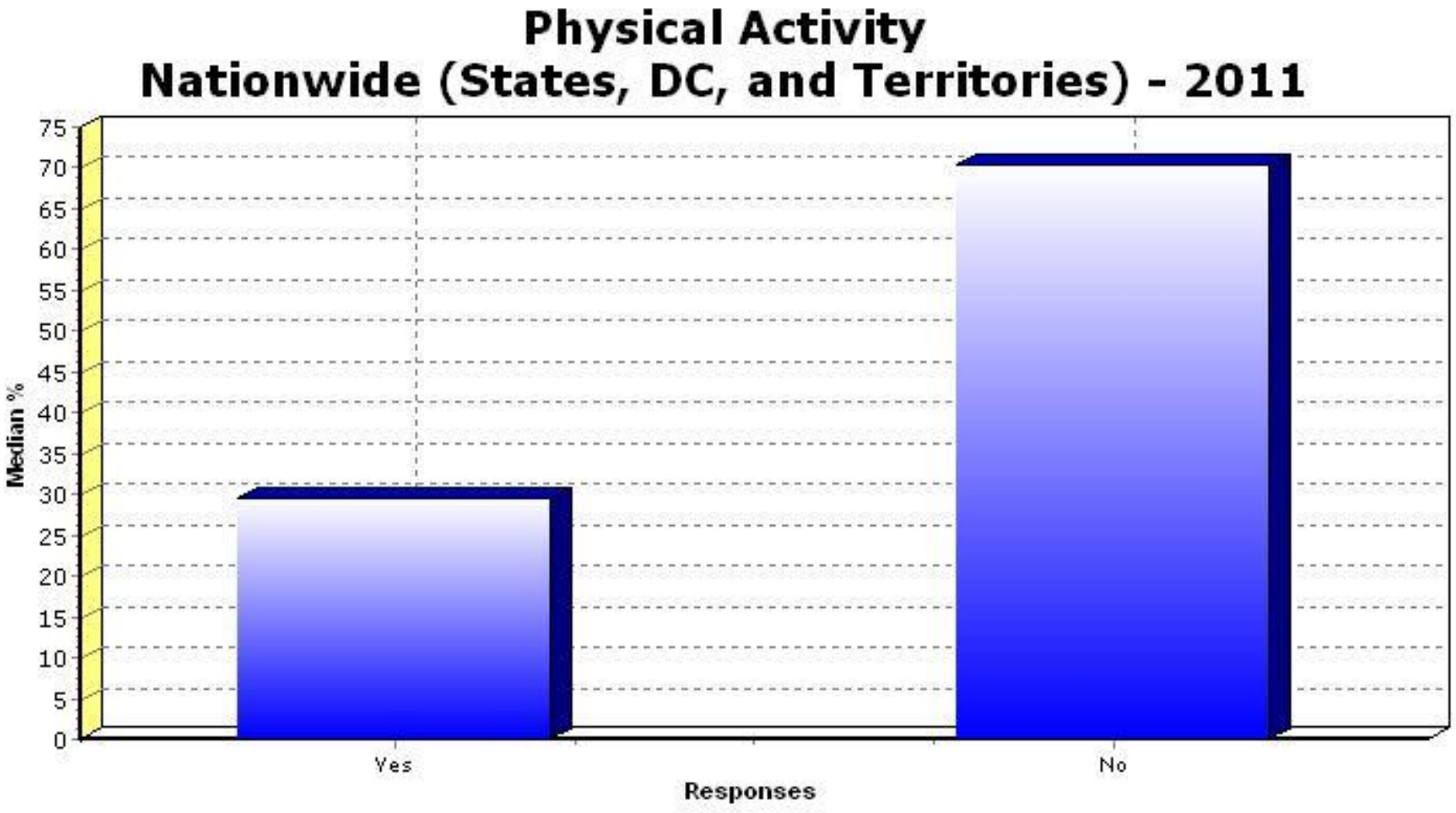
National Center for Chronic Disease Prevention & Health Promotion
Behavioral Risk Factor Surveillance System

Participated in 150 minutes or more of Aerobic Physical Activity per week



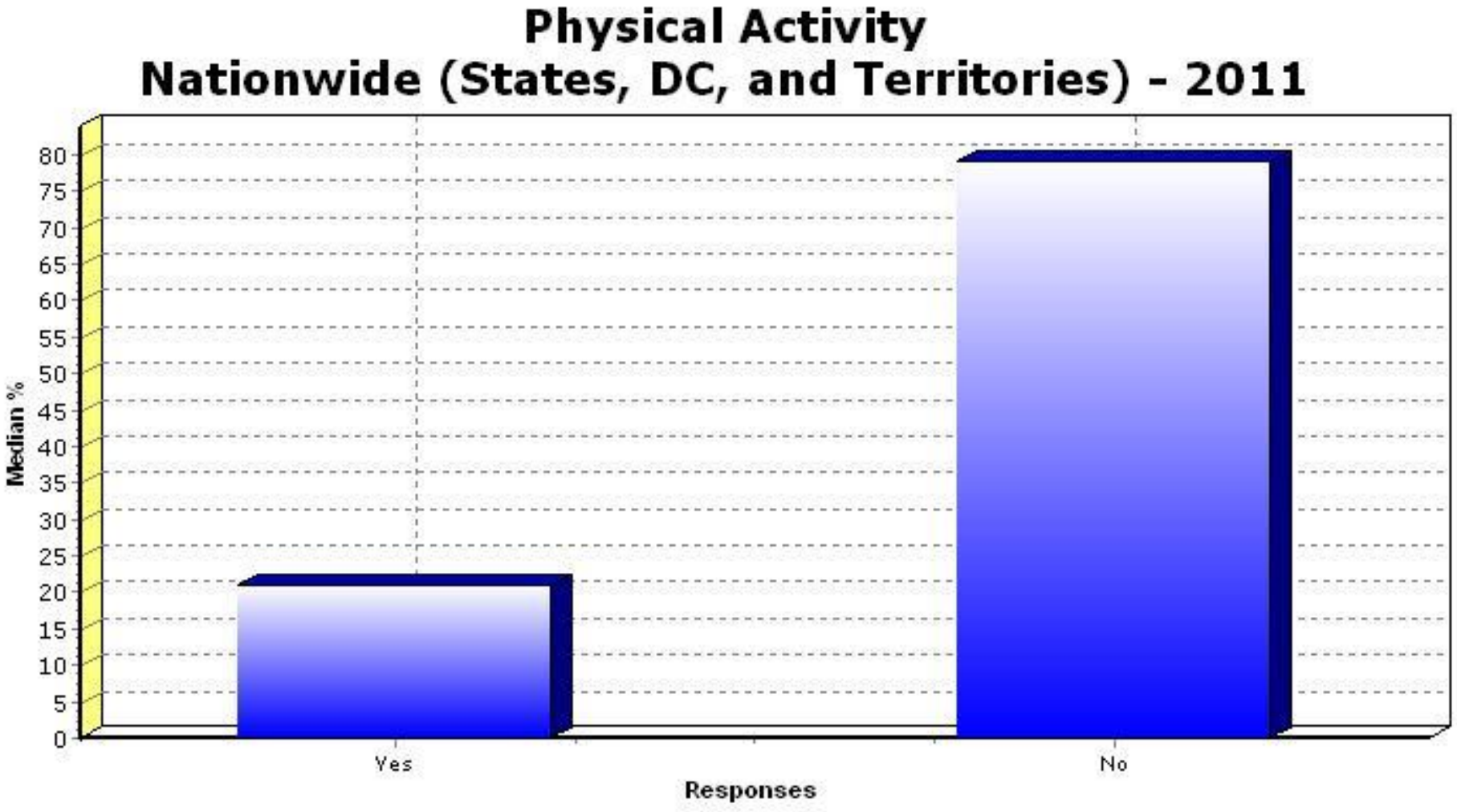
National Center for Chronic Disease Prevention & Health Promotion
Behavioral Risk Factor Surveillance System

Participated Muscle Strengthening exercises more than twice per



National Center for Chronic Disease Prevention & Health Promotion
Behavioral Risk Factor Surveillance System

Participated in enough Aerobic and Muscle Strengthening exercises to meet guidelines



National Center for Chronic Disease Prevention & Health Promotion
Behavioral Risk Factor Surveillance System

Objective Physical Activity Surveillance (Accelerometry)

Troiano et al. (2008)

- 42% of children ages 6-11 yr obtain the recommended 60 min x d(-1) of physical activity
- only 8% of adolescents achieve this goal
- Among adults, adherence to the recommendation to obtain 30 min x d(-1) of physical activity is less than 5%.

CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

BRFSS™

nhanes

Legend for Task Force Findings: Recommended | Insufficient Evidence | Recommended Against (See reverse for detaile

INTERVENTION	TASK FORCE FINDING
Campaigns and informational approaches	
Community-wide campaigns	●
Stand-alone mass media campaigns	◆
Classroom-based health education focused on providing information	◆
Behavioral and social approaches	
Individually adapted health behavior change programs	●
Social support interventions in community settings	●
Family-based social support	◆
Enhanced school-based physical education	●
College-based physical education and health education	◆
Classroom-based health education to reduce TV viewing and video game playing	◆
Environmental and policy approaches	
Community-scale urban design and land use policies	●
Creation of or enhanced access to places for physical activity combined with informational outreach activities	●
Street-scale urban design and land use policies	●
Transportation and travel policies and practices	◆
Point-of-decision prompts to encourage use of stairs	●

Individually-adapted PA interventions

- Key elements
  - Goal setting & self-monitoring progress towards goals
  - Social support
  - Positive reinforcement (self-rewards, positive self-talk)
  - Self-regulation skills (problem solving, developing skills to prevent relapse)
- Kahn et al. (2002)
- Foster et al. (2005) – Cochrane review
  - Stricter criteria for selection of intervention studies (RCTs)
  - Smaller but positive effects
  - Highlighted usefulness of telephone and printed educational materials

Multiple Behavior Change Research

- Efforts to promote two or more health behaviors
- The interrelationships among health behaviors and interventions designed to promote change in more than one health behavior at a time
- Presents a unique set of challenges
  - theoretical, methodologic, intervention, statistical, and funding issues

Rationale for MHBC Research

Approximately half of all causes of mortality in the United States are linked to social and behavioral factors such as smoking, diet, alcohol use, sedentary life-style, and accidents. Yet less than 5% of the approximately $1 trillion spent annually on health care in the United States is devoted to reducing risks posed by these preventable conditions. Behavioral and social interventions therefore offer great promise to reduce disease morbidity and mortality, but as yet their potential to improve the public's health has been relatively poorly tapped.

— *Institute of Medicine*

Rationale for MHBC Research

- The major causes of morbidity and premature mortality in the US (heart disease, cancer, and stroke) influenced by multiple health risk behaviors (including smoking, alcohol abuse, physical inactivity, and poor diet)
- In the US, only 3% of adults meet all four health behavior goals of being a nonsmoker, having a healthy weight, being physically active, and eating 5 or more fruits and vegetables a day (Reeves & Rafferty, 2005)

Rationale for MHBC Research – cont.

- Clustering of unhealthy behaviors
  - In the US, the majority of adults meet criteria for two or more risk behaviors (Fine et al., 2004; Pronk et al., 2004)
- 92% of smokers exhibit at least one additional risk behavior (Fine et al., 2004; Klesges et al., 1990; Pronk et al., 2004)
- 9 out of 10 overweight women at least two eating or activity risk behaviors (Sanchez et al., 2008)

Rationale for MHBC Research – cont.

- Success in changing one or more lifestyle behaviors may increase self-efficacy to improve risk behaviors individuals have low motivation to change
  - Gateway behavior to overall healthy lifestyle?
- Limited contact opportunities for health promotion – should aim for interventions that could simultaneously improve multiple risk behaviors
- Interventions targeted at single risk behaviors, even if effective, will be limited in their impact

Methodological Issues in MHBC

- Design issues
  - How many behaviors to target at once?
  - Specific combinations of specific behaviors? Are some more compatible than others?
  - Differential motivation to change different behaviors
  - Implications for timing? Introduce behaviors at the same time or sequentially?

Hyman et al. (2007)

- Is sequential presentation of stage of change–based counseling to stop smoking, reduce dietary sodium level, and increase physical activity by at least 10 000 pedometer steps per week more effective than simultaneous counseling?
- African Americans (N=289) with hypertension, aged 45 to 64 years, initially non-adherent to the 3 behavioral goals, were randomized:
  (1) 1 in-clinic counseling session on all 3 behaviors every 6 months, supplemented by motivational interviewing by telephone for 18 months;
  (2) a similar protocol that addressed a new behavior every 6 months;
  (3) 1-time referral to existing group classes ("usual care").

The primary end point was the proportion in each arm that met at least 2 behavioral criteria after 18 months.

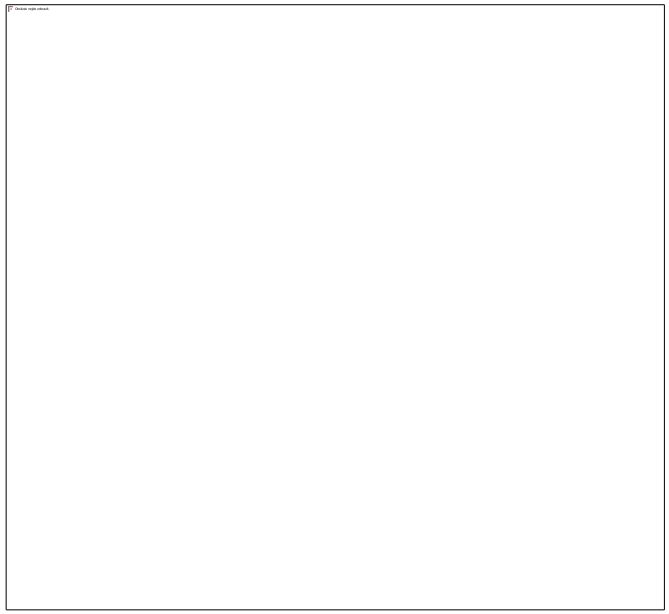
Hyman et al. (2007) - results

- At 18 months, only 6.5% in the simultaneous arm, 5.2% in the sequential arm, and 6.5% in the usual-care arm met the primary end point
- Results for single behavioral goals consistently favored the simultaneous group
  - At 6 months, 29.6% in the simultaneous, 16.5% in the sequential, and 13.4% in the usual-care arms had reached the urine sodium goal
  - At 18 months, 20.3% in the simultaneous,16.9% in the sequential, and 10.1% in the usual care arms were urine cotinine negative

King et al. 2013

- Four intervention groups: a sequential exercise-first group, a sequential diet-first group, a simultaneous group, and a control group
- 12 months interventions; 4 months in between sequential behaviors
- Telephone-based counseling (SCT, TTM); control received stress management advice

Fruit & Vegetable Intake



Calorie Intake from Sat. Fat

MVPA

- The behaviors presented first, showed greater improvement in sequential interventions (suppression effect of “diet first” on physical activity)
- In simultaneous group, changes in both behaviors comparable, the size of the effect similar to that of “first behavior” in the sequential group

Methodological Issues in MHBC

- Measurement issues
  - Separate or composite measures?
- Data analysis
- Theory testing across behaviors
- Participant burden

Behavior Change from the Perspective of Motivational Interviewing

Motivational interviewing is a directive, client-centered counseling style for eliciting behavior change by helping clients to explore and resolve ambivalence.

Source: http://www.motivationalinterview.org/

Miller WR, et al. Motivational Interviewing, 2nd ed. Guilford Press; 2002.

Berger B. Motivational interviewing helps patients confront change. Available at:http://www.uspharmacist.com/oldformat.asp?url=newlook/files/Phar/nov99relationships.cfm&pub_id=8&article_id=450.

The Spirit of Motivational Interviewing

- Collaborate with the patient
- Evoke their readiness to take action (elicit “change talk”)
- Develop patient’s autonomy to take responsibility for their own health

Behavior change can be facilitated but not coerced.

Strategies for Successful Interaction with Patients

Elicit-Provide-Elicit

- Menu of Strategies

The Five Principles

- READS

Helpful Tools

- Readiness Rulers
- The Envelope

Rollnick S, et al. *Health Behavior Change: A Guide For Practitioners*. Churchill Livingstone; 2003.
Berger B. Motivational interviewing helps patients confront change. Available at: http://www.uspharmacist.com/oldformat.asp?url=newlook/files/Phar/nov99relationships.cfm&pub_id=8&article_id=450

Strategies for Successful Interaction with Patients

ELICIT-PROVIDE-ELICIT

- The good things and bad things
- What do they like and dislike about the proposed changes?
- What is their representation of the illness and its treatment?
- Do they agree with the NP/MD?
- Do they believe they can do what is asked? What will help?
- What are the barriers?
- IS THE PATIENT READY FOR THE CHANGE?

Five Principles of MI

- Express empathy
- Develop discrepancy
- Avoid argumentation
- Roll with resistance
- Support self-efficacy

Building Motivation

- Explore ambivalence and build motivation

(1) Open-ended questions

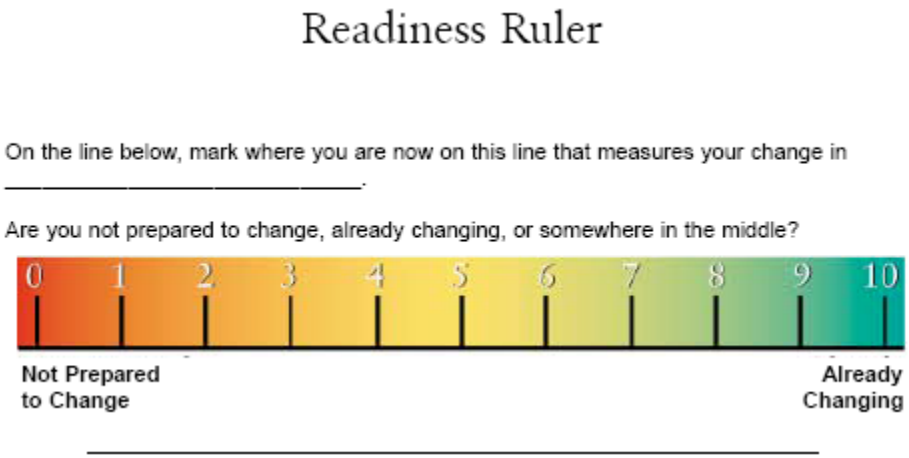
(2) Reflective listening

(3) Affirmations

(4) Summaries

(5) Elicit self-motivational statements (change talk)

Readiness to Change: Eliciting Change Talk



"If I handed you an envelope, what would the message inside have to say to get you to _____?"

Building Motivation

- Goal is to get patient/client to articulate:

  - The steps I plan to take are:
  - Challenges that may interfere:
  - How I will handle these challenge
  - I’ll know my plan is working if:

MHBC Challenges

- Timing of treatment
- Measuring changes in multiple behaviors
- Theory testing across behaviors
- Participant burden