

Public Health Approaches to Tobacco Control: Lessons learned in Massachusetts



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Presented to the Institute of Medicine, Committee on Reducing Tobacco Use, Irvine, Dec. 16,
2004



Topics

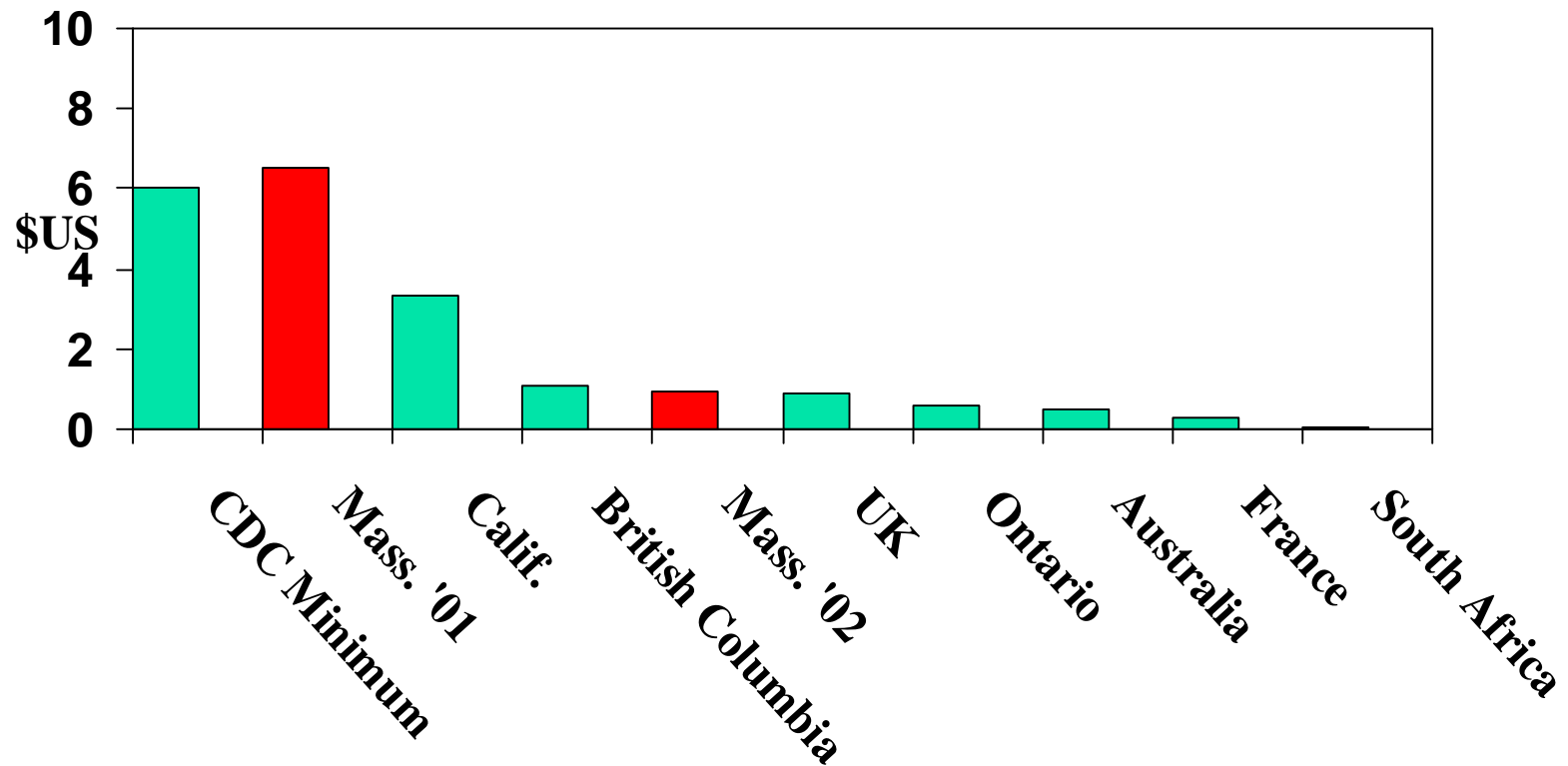
- n Massachusetts tobacco control program
- n Indicators of overall effectiveness
- n Evaluation of mass media campaign
- n Multilevel analysis of relative effectiveness of policy and media



MTCP History and Funding

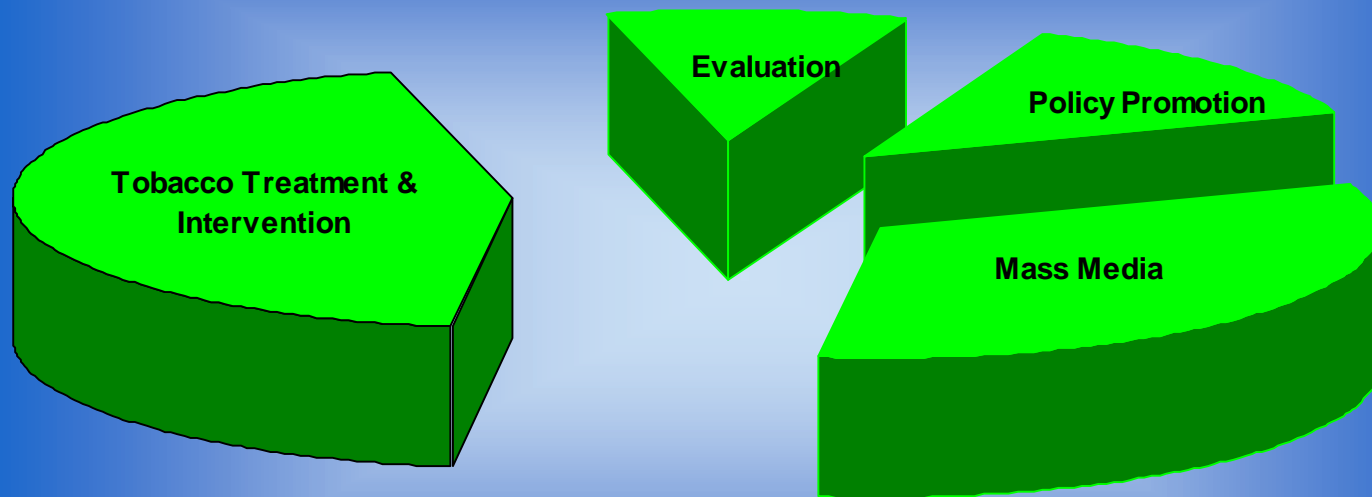
- n 1992 - Ballot initiative (Q1) passed
- n 1993 - 25 cent per pack tax
- n 1994 - Program fully under way
- n 1998 - Master Settlement Agreement
- n 2002 - Program funding slashed

Per Capita Expenditures for Tobacco Control ('97 - '02)

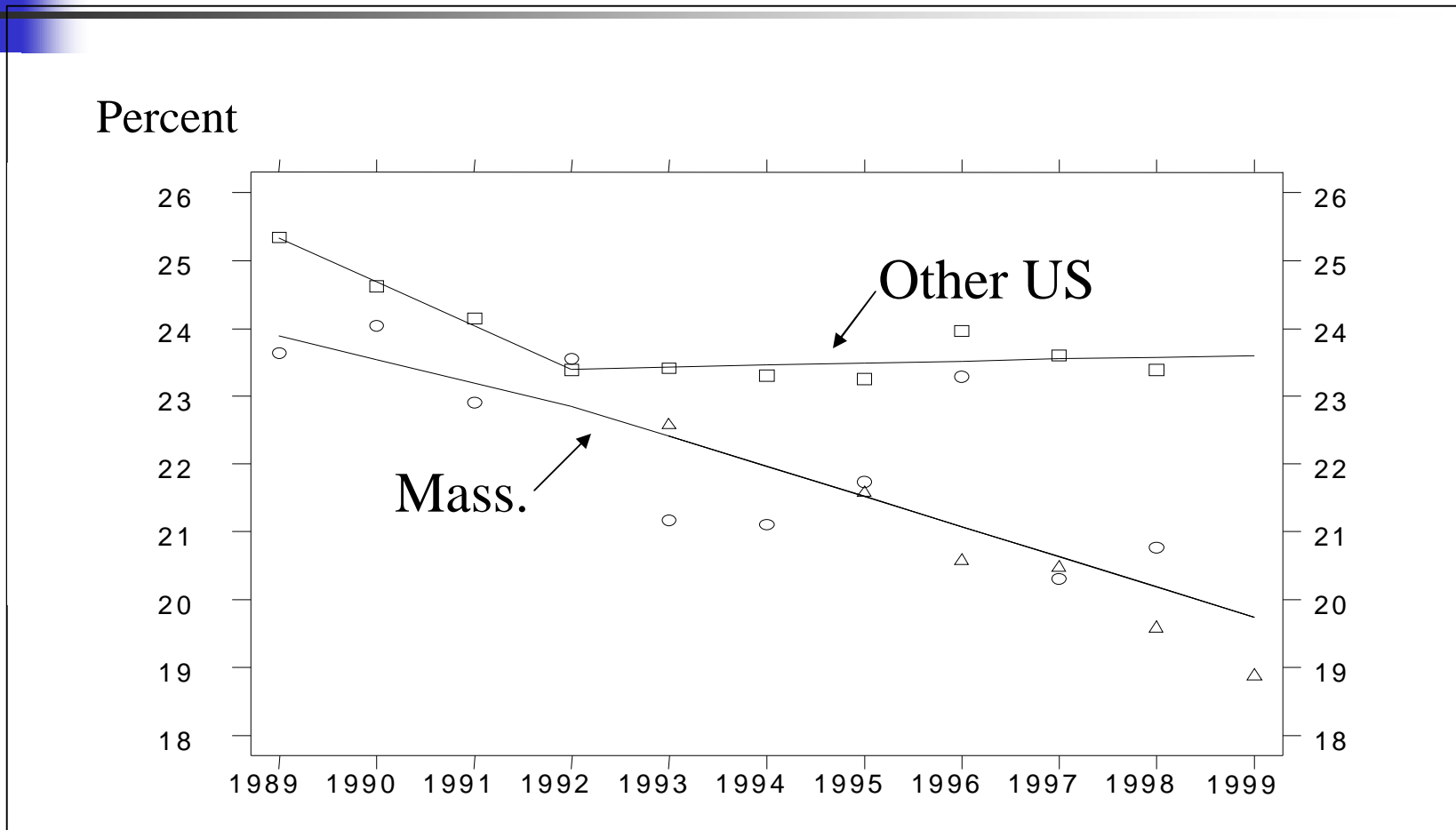


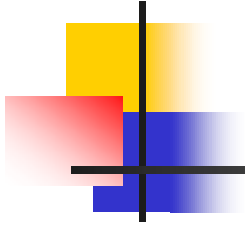
Source: Biener, Harris, Hamilton,
BMJ, 2000

Comprehensive Program Elements



Adult Smoking Prevalence Massachusetts vs 40 US States





Impact of Mass Media Campaign



Massachusetts Media Campaign

- n Launched in 1994
- n Average annual expenditure \$13 million through 2001
- n Multiple targets
 - n Youth (Used Legacy as of 2000)
 - n Adult smokers
 - n Public Opinion



Multiple Strategies

- n The truth about the industry
 - n Rebel against industry manipulation
- n Real people, real stories
- n Not smoking is cool, smoking is not.
- n Addiction
 - n Preserve independence by avoiding addiction
- n Smoking harms the family



Emotional tone

- n Sadness, pain
- n Anger
- n Humor
- n Aspiration/hope



Research Goals

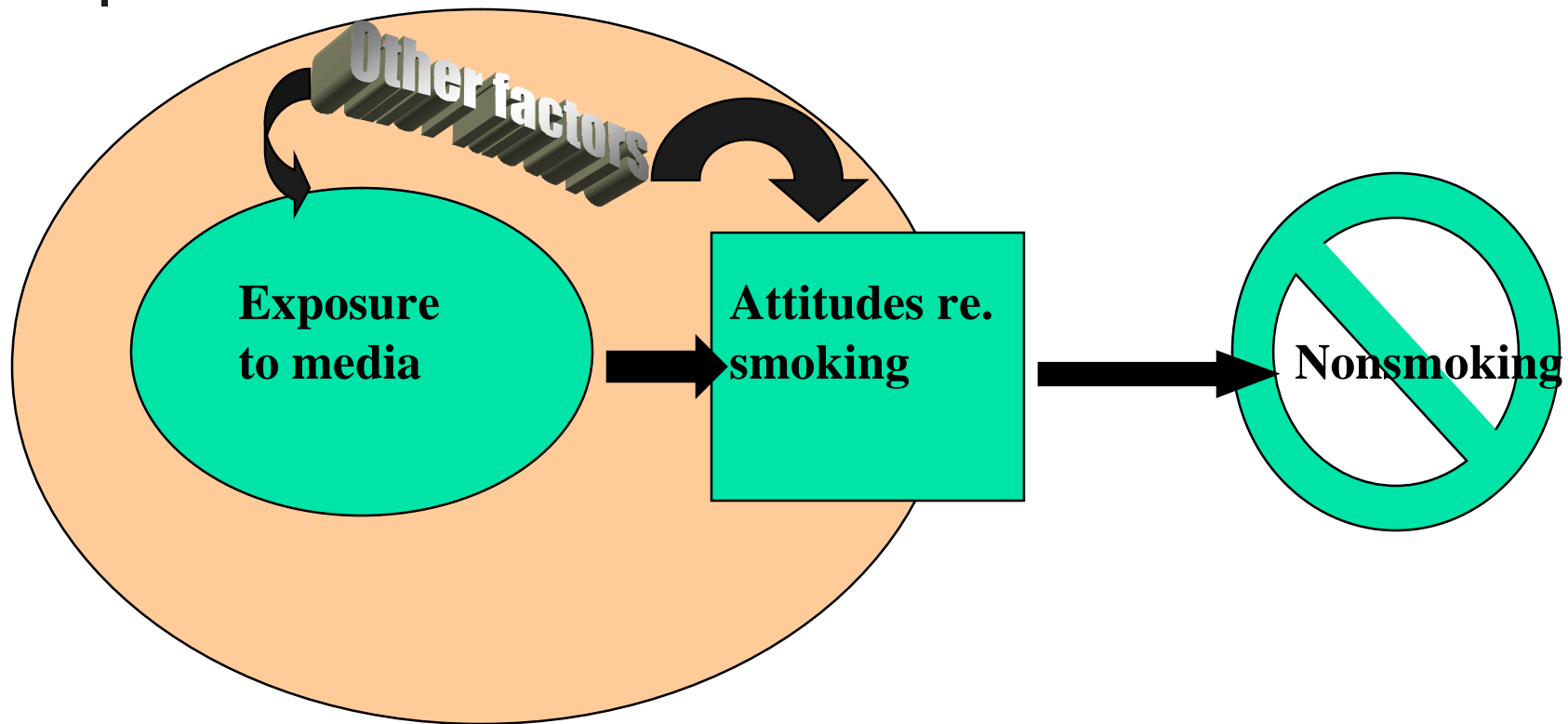
- n Investigate impact on behavior
- n Investigate relative effectiveness of various strategies.



Media Studies

- n Impact on youth smoking
 - n Longitudinal study '93 – '97
- n Relative effectiveness of TV advertising approaches
 - n Adult '93 to '96
 - n Youth '93 to '97
 - n Youth '99
 - n Adult and Youth 2001/2

Impact on behavior: Analytic Model



Methods: Sample

1993

Baseline:

1,069 youths

Ages 12-15



1997

Follow-up:

618 youths

57.8% overall
response rate

Cohort: 592 youths who hadn't yet smoked 100 cigarettes
baseline



Methods: Measures of Exposure

- n In past month, seen any anti-tobacco messages...
 - n On television ?
 - n On radio?
 - n On billboards?



Methods: Measures of Attitudes

- n Poison in cigarettes
- n Smoking causes wrinkles
- n Lite cigarettes are hazardous
- n Nonsmokers prefer to date nonsmokers
- n Smoking hurts sports ability
- n Tobacco companies lure kids
- n ETS causes lung cancer
- n Most kids don't smoke



Outcome Measure (1997)

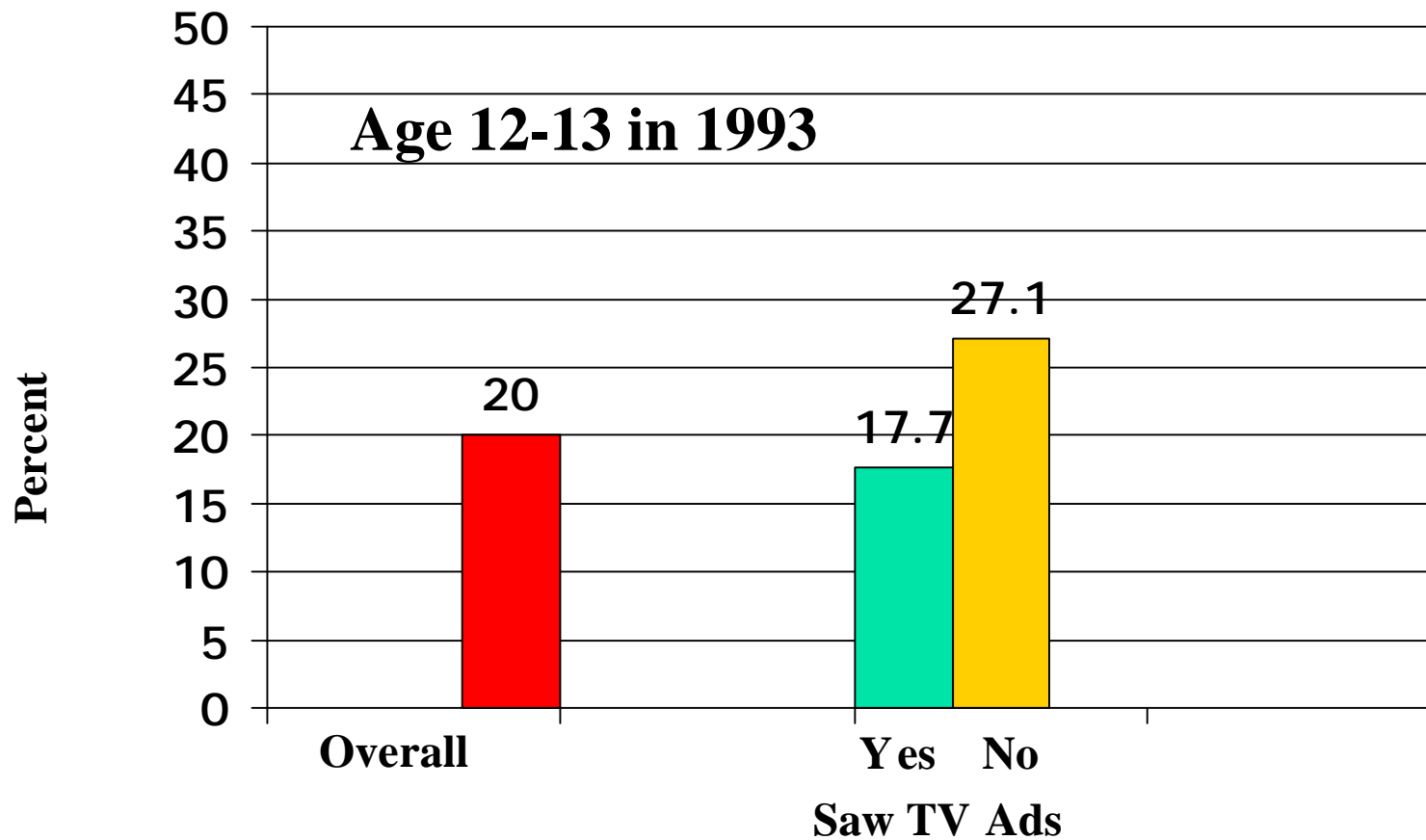
- n Smoked at least 100 cigarettes in lifetime ?
 - n (Yes/No)



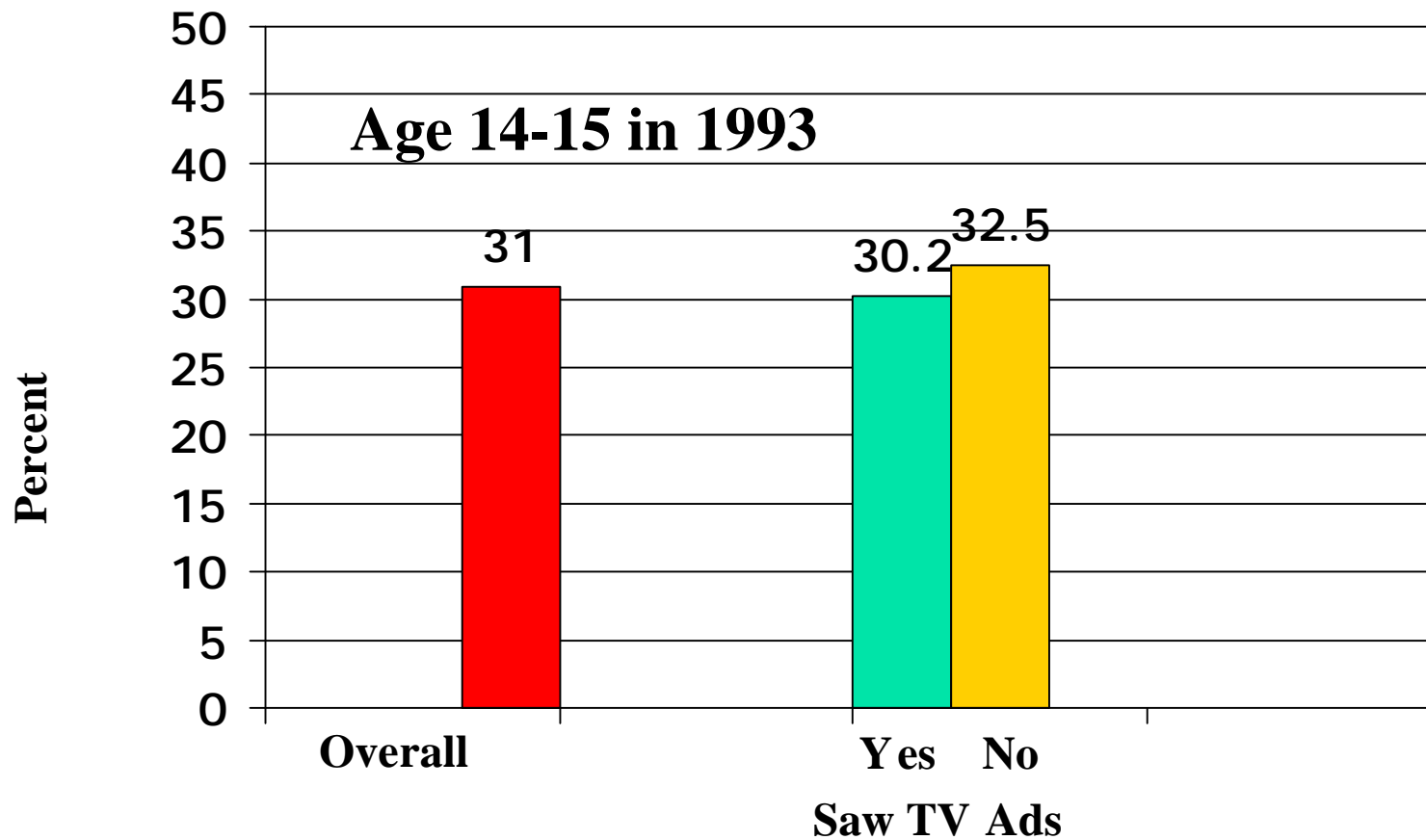
Covariates (1993)

- n Age, race, gender
- n Baseline susceptibility to smoking
- n Smoking by parents and friends
- n Hours of TV viewing
- n Exposure to other anti-smoking messages
 - n (posters, newspapers, school, sporting events)
- n Interactions

Results: Established Smokers in 1997



Results: Established Smokers in 1997





Results:

Multivariate Analysis

- n Effect of exposure to anti-smoking messages on television:

- n Youths ages 12-13 at baseline

- OR = 0.49

- 95% CI = 0.26, 0.93

- n Youths ages 14-15 at baseline

- OR = 0.94

- 95% CI = 0.48, 1.83



Results: Mediators

- n Youths exposed to television messages at baseline were more than twice as likely to have (at follow up) an accurate perception of the proportion of kids who smoke

OR = 2.34

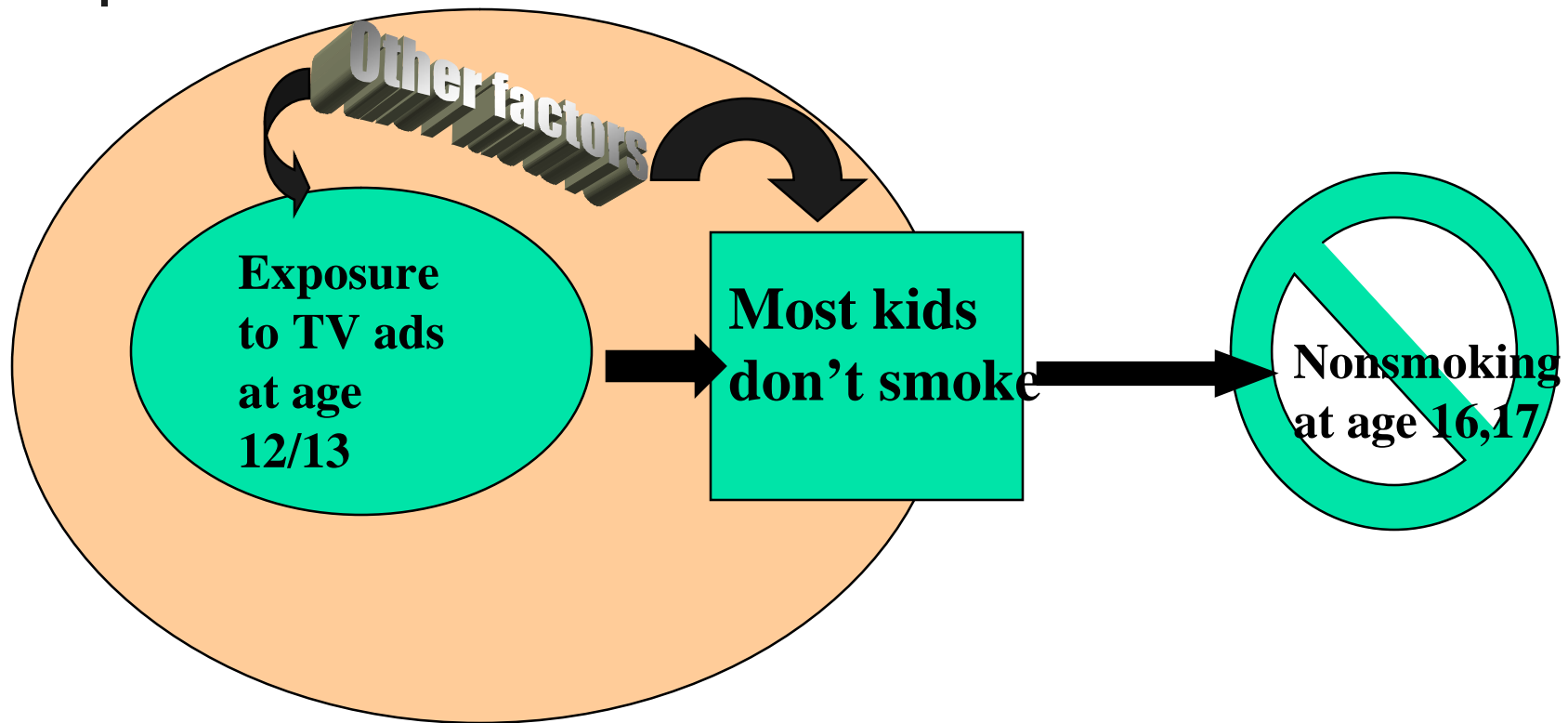
95% CI = 1.40, 3.91



Results

- n No effect of baseline exposure to television messages on 7 of 8 mediating variables
- n No effect on smoking of radio or billboard exposure

Findings





Relative effectiveness of advertising approaches

- n Independent judges (youth and adults)
 - n To establish characteristics of advertisements
- n Broadcast parameters
 - n GRPs, remoteness
- n Population-based telephone surveys
 - n To assess how adults and youth in Massachusetts have reacted to specific ads



Independent Judges

- n View TV spots and rate characteristics
 - n “How well do each of following describe the advertisement?”
 - n 1 = Not at all
 - n 7 = Very much



Judges' Rating Scales

(1 to 7)

- n Sad
- n Frightening
- n Funny
- n Emotionally moving
- n Believable
- n Interesting
- n Phony
- n Annoying
- n Entertaining
- n Reassuring
- n Helpful
- n Offensive
- n Important
- n Silly



Advertising parameters

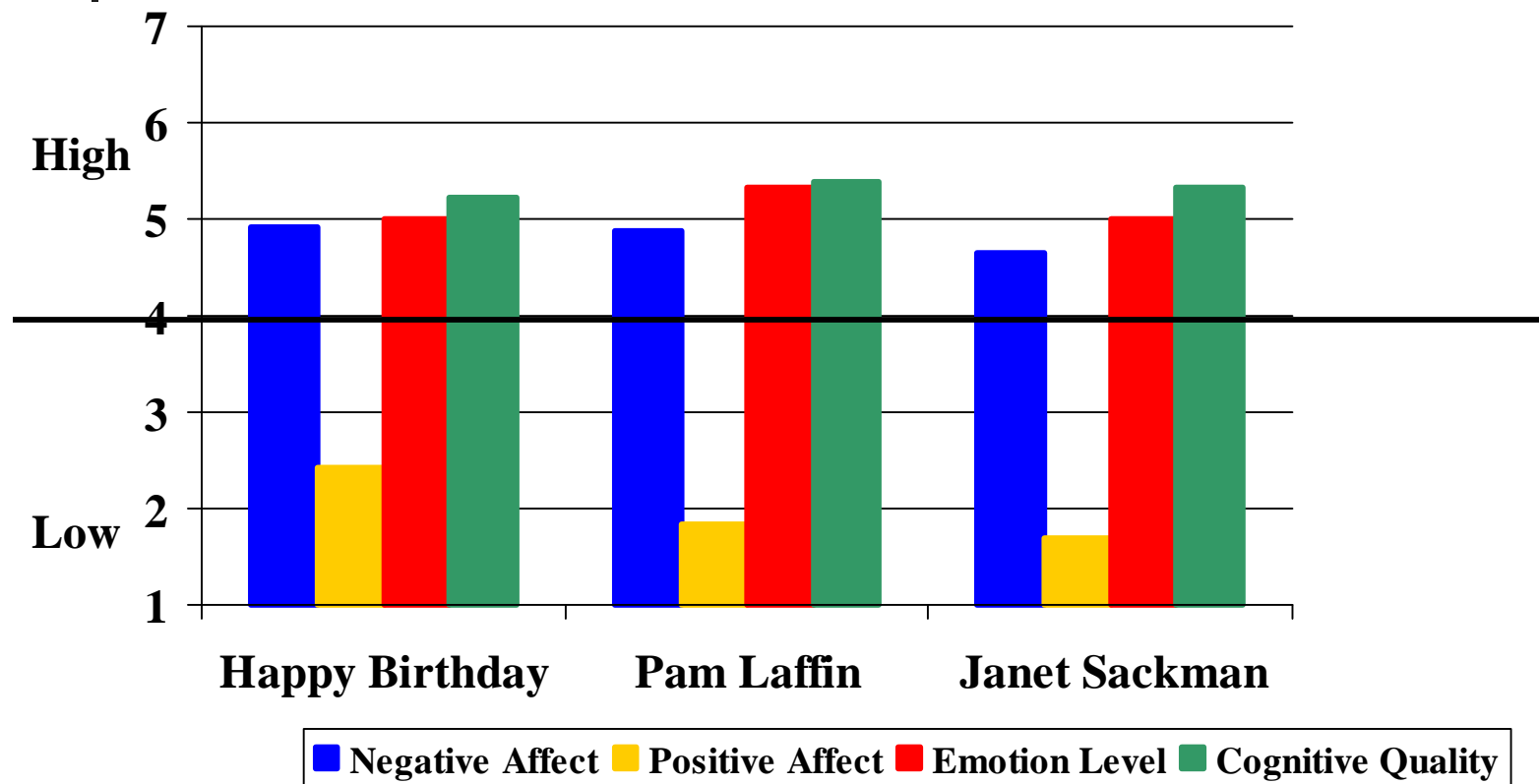
- n **Negative Emotion:** Sad, frightening, disturbing
- n **Positive Emotion:** Happy, funny, entertaining
- n **Level of Emotion:** Powerful, emotionally moving
- n **Cognitive quality:** Makes you think, interesting



Message Identification

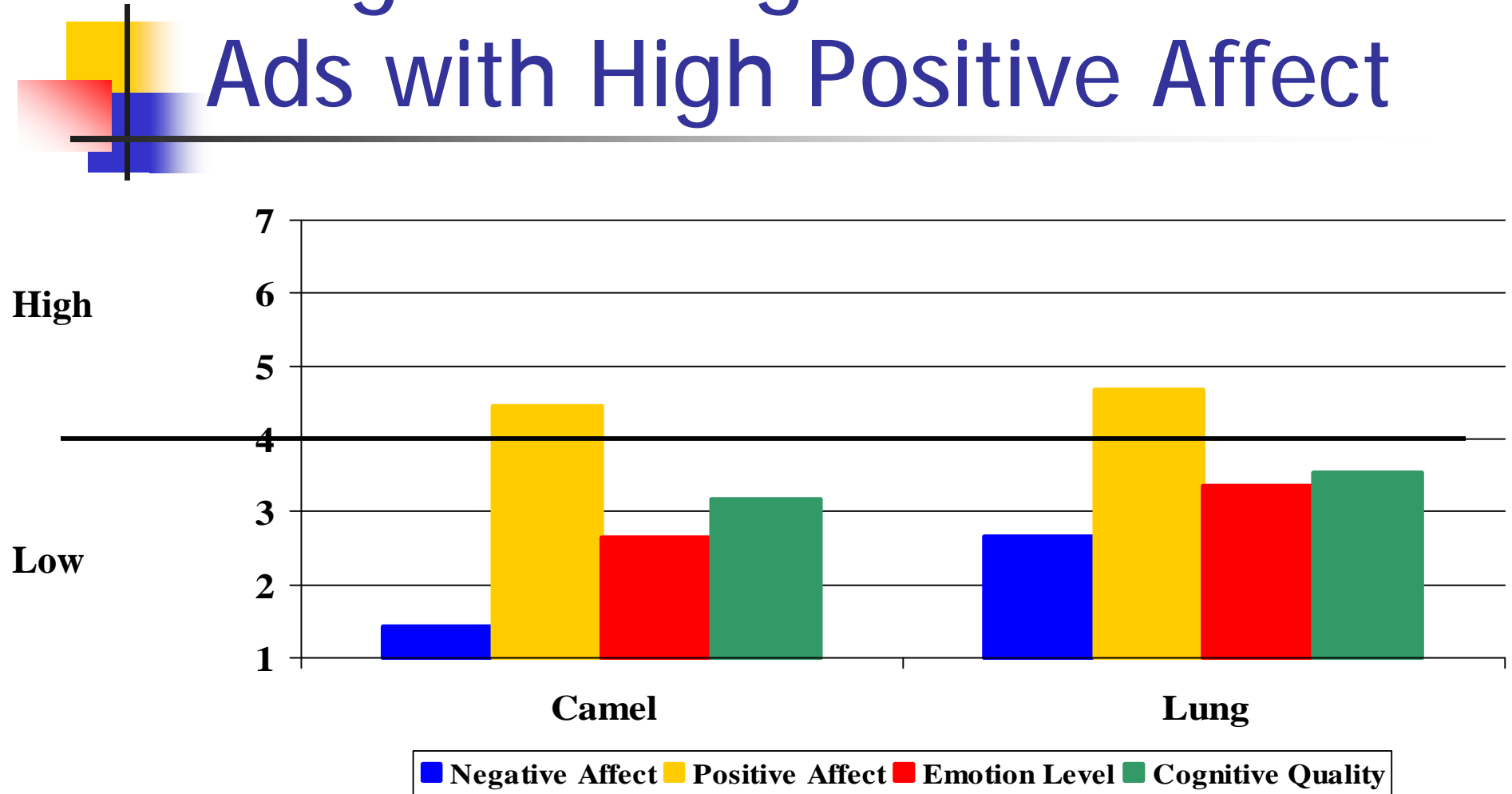
- n What was the **main** message of the ad? (Check one only).
 - “ Cigarettes and cigarette smoke are bad for people’s health (Illness)
 - “ Tobacco companies are bad (Anti-industry)
 - “ Teenagers shouldn’t smoke cigarettes (Norms)

Judges' Ratings: Ads with High Emotion



Source: Youth Judges (N = 104)

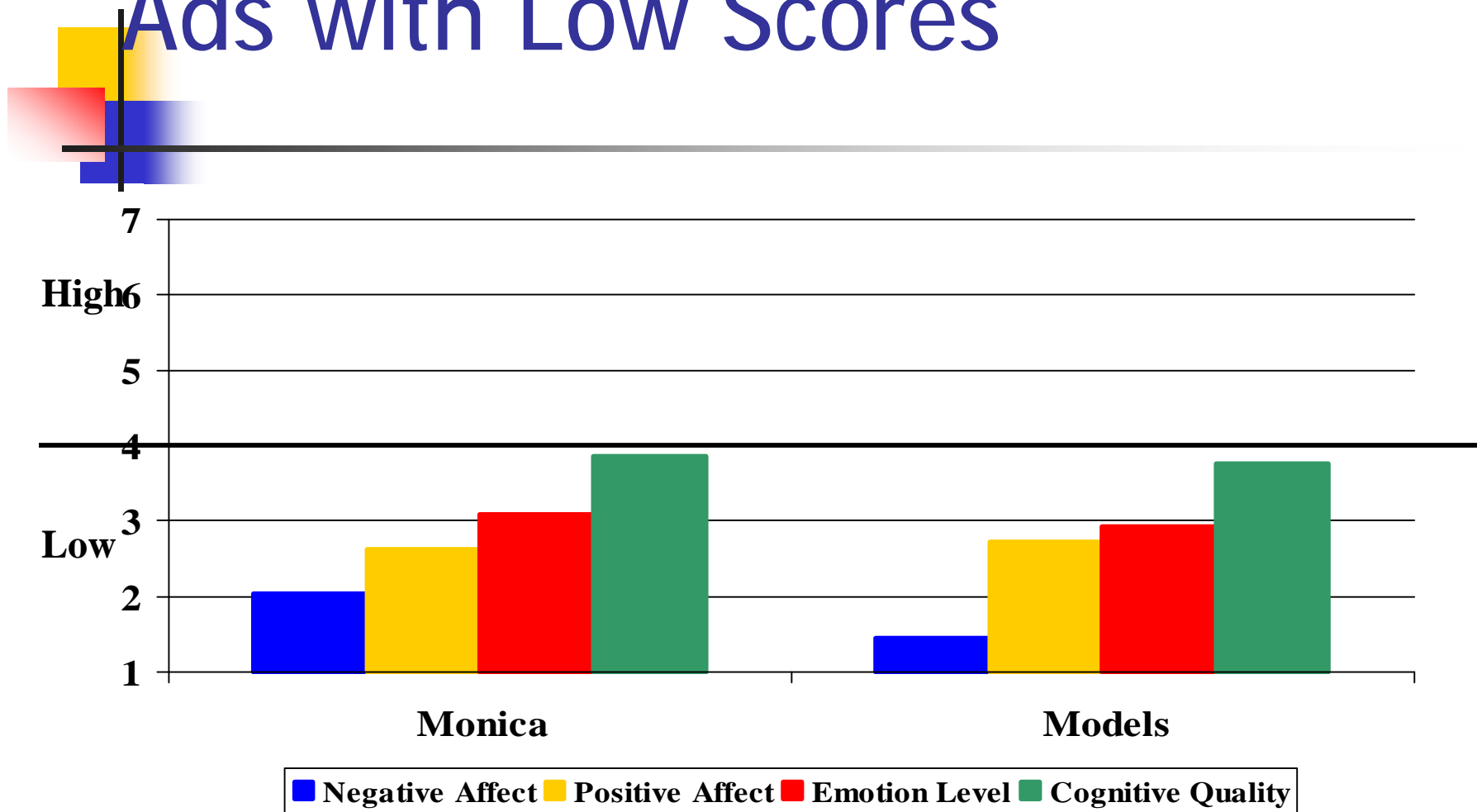
Judges' Ratings: Ads with High Positive Affect



Source: Youth Judges (N=104)

Judges' Ratings

Ads with Low Scores



Source: Youth Judges (N=104)



Relationships between message and affect

- n Illness message: High negative affect, high emotion
- n Norms message: Varies – usually high positive affect, low emotion
- n Anti-industry message: Varies with execution



Population surveys

- n Cross-sectional

- n Adults 1993, 1995 - 2002

- n Youth 1993, 1999, 2002

- n Longitudinal

- n Adults 1993 to 1996; 2002 to 2004

- n Youth 1993 to 1997; 2002 to 2004



Evaluation approach

- n Select subset of ads for theoretical/conceptual purpose
- n Assess recall
- n Assess perceived effectiveness



Population Surveys: Recall

- n Unaided recall
 - n *Could you please describe an anti-smoking television ad that you have seen recently?*
- n Aided, confirmed recall
 - n *One series of ads features a man talking about his wife who died. Have you seen any of those ads? (if yes) Would you please tell me more about the ad, for example who appeared...what was said?*



Population Surveys: Perceived effectiveness

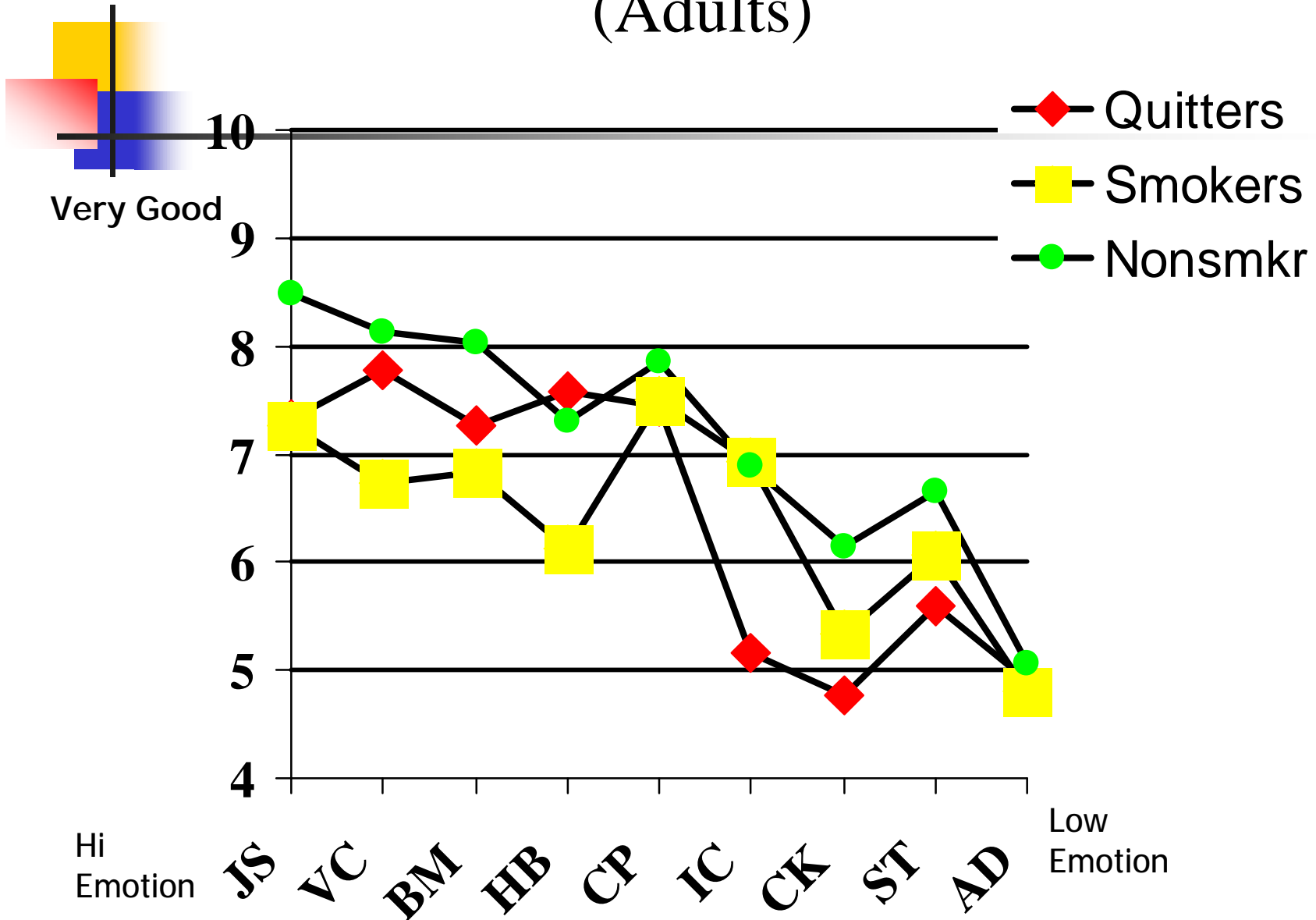
- n How would you rate it on a scale from 0 to 10, where 0 means it is not a good anti-smoking ad at all and 10 means it is a very good ad?*



Results: Population Surveys

- n Adult longitudinal study (1993 - 1996)
 - n Assessed perceived effectiveness of 9 tv advertisements in 1996
 - n Results for 3 groups:
 - n Quitters (n=135)
 - n Continuing smokers (n=650)
 - n Nonsmokers (n=759)

How Good an Ad by Emotion Level (Adults)





Results

- n Ads perceived as most effective by all subgroups were those high in negative emotion. These depicted illness due to tobacco use.
- n Humorous ads were seen as least effective.
- n Continuing smokers rated emotional “tips” ad as highly effective.



Youth Longitudinal Survey

Representative sample of 618 Massachusetts teens interviewed by telephone before spots were aired ('93) and four years later ('97).

Aided recall of 8 spots is measured.

Spots are rated on a 0 to 10 scale of "effectiveness"

Correlates of perceived effectiveness are examined:

- n Viewer characteristics
- n Ad characteristics



Analysis Plan

- n Generalized estimating equation (GEE)
- n Dependent variables
 - n Likelihood of being recalled (0,1)
 - n Perceived effectiveness (0 - 10)

Analysis Plan (Cont'd)

Explanatory Variables



- n Viewer characteristics
 - n Demographics: Age, sex, SES, parental smoking
 - n Smoking orientation: Smoking initiation or continuation, ownership of promotional item, peer smoking
 - n Amount of TV viewing

Analysis Plan (Cont'd)

Explanatory Variables



- n Advertisement characteristics
 - n Ad type (sad/frightening vs. funny vs. teen norms/low emotion)
 - n Advertising intensity (GRPs)
 - n Remoteness of broadcast



Results: Ad characteristics and recall

- n Ads evoking strong emotions are recalled better than those evoking weak emotions.
- n Higher GRPs (more broadcast time) is associated with better recall.



Results: Ad characteristics and effectiveness

- n TV ads evoking strong negative emotions are seen as most effective.
- n Humorous ads are seen as less effective.
- n Ads portraying serious consequences of smoking are likely to be emotionally intense.
- n Highest GRPs associated with lower effectiveness ratings (controlling for other characteristics)



Results

- n Highly rated ads are those which
 - n Depict serious illness and suffering due to smoking
 - n Report on harm done by tobacco and the tobacco industry in a dramatic way
 - n Arouse strong emotion in viewer



Results

- n Ads emphasizing nonsmoking as a teen norm were perceived as less effective whether made by a tobacco company or a health department.
- n Younger teens responded more favorably to the normative ads.



Controlled Exposure Studies

- n Teenage Research Unlimited (1999)
- n Terry-McElrath, et al. (in press)
- n Pechmann et al (2003)



Naturalistic Exposure

- n Farrelly et al. (2002)
- n Biener et al. (2000)
- n Biener et al. (2002)
- n Biener et al. (2004)
- n Donovan et al. (2003)
- n Carol and Rock (2003)



Summary of findings

- n In all studies except 1 (Pechman) ads that performed best were the most highly arousing.
- n Normative messages were judged less effective
- n Humorous messages were judged less effective.



Survey of recent quitters (n=700)

- n Did any television commercials about cigarettes contributed to your quitting smoking?
- n (If yes) Could you describe one such commercial?

Categorization of Open Ended Descriptions of TV Ads

Illness:

**Australia Series
Baby Monitor
Careful
Cowboy
Debbie
ETS
Generic Sick Person
Pam
Rick
Ronaldo**

**Inspirational Quit Tip:
Girlfriends
Picture on Pack**

Body Bags:

**Body Bags / NYC
Body Bags / Generic
Body Bags / Other**

Other Truth:

**Daily Dose / Illness
Generic Truth**

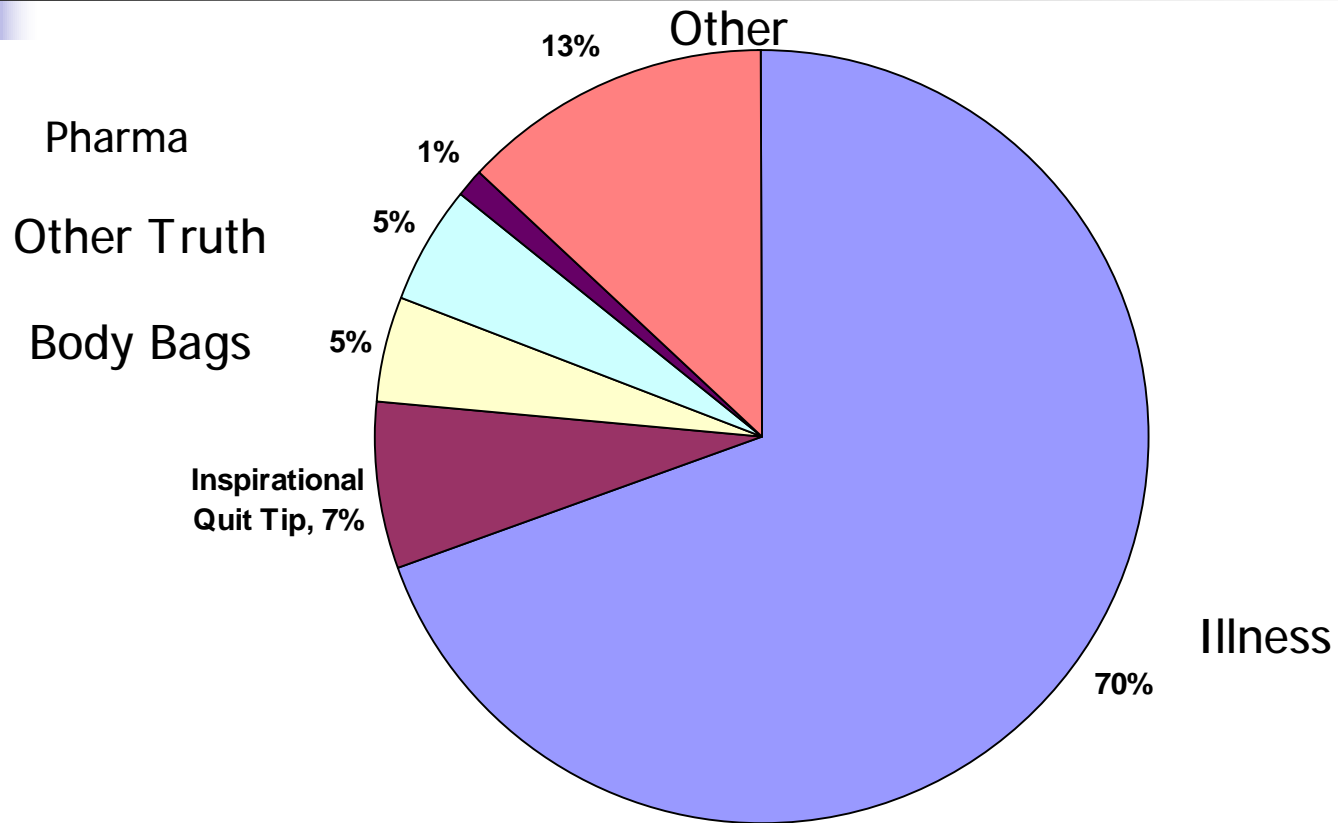
Pharmaceuticals

Other:

**Celebrities Saying Don't Smoke
Generic Teen Norms
DPH Tagline
Can't classify**

Types of TV Ads That Contributed to Quitting

N = 220



Information Processing Mechanisms (Lang et al.)

- n Negative messages → Higher arousal
- n Higher arousal → Better memory
- n Higher arousal → Higher allocation of cognitive resources



Information processing (cont'd)

- n If equated for arousal, positive messages recalled better than negative ones.



UMass Tobacco Study

Investigating the relative impact of the following interventions on adult and youth smoking:

- ∅ Local clean indoor air policies
- ∅ Local youth access ordinances
- ∅ Exposure to anti-tobacco mass media campaign

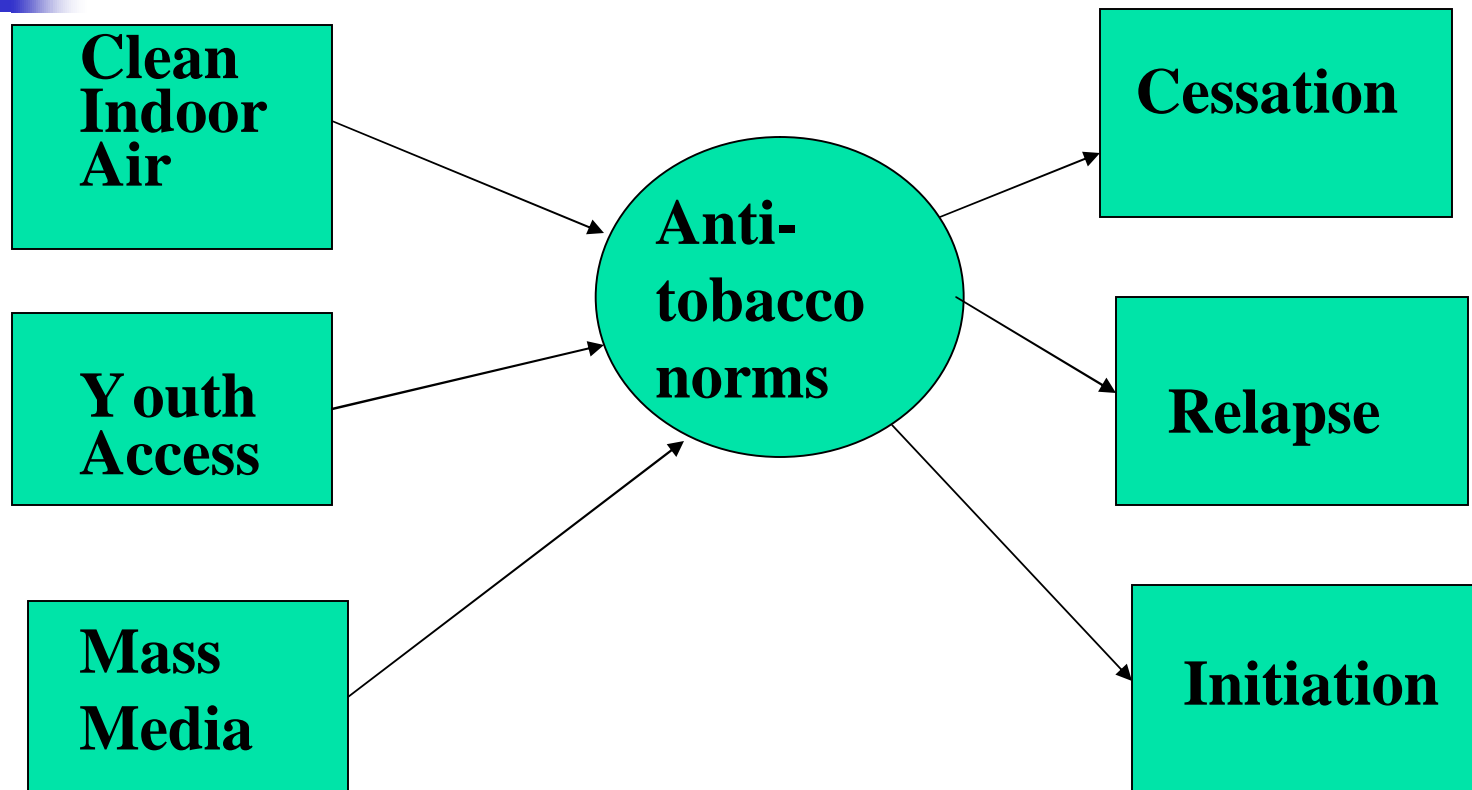


Investigators

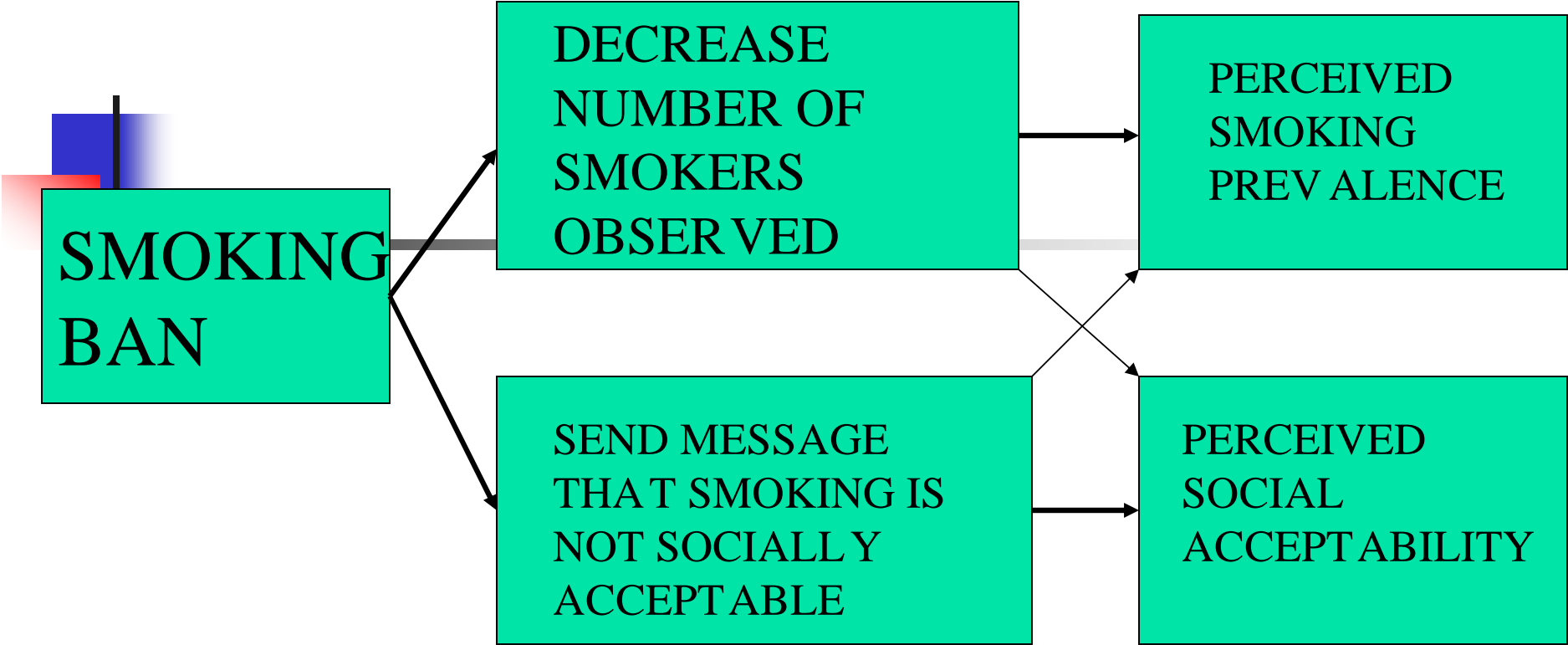
- n Lois Biener , PhD (PI)
- n Michael Siegel, MD, MPH
- n Nancy Rigotti, MD
- n William Hamilton, PhD
- n Gregory Connolly, DDM

Funded by NCI, TRISCI

Mechanisms of Effectiveness



CONCEPTUAL FRAMEWORK: Effect on social norms





Methods

- n Longitudinal telephone surveys of Mass. adults and youth at two year intervals starting in 2001.
- n Linked town-level data on smoking regulations, interventions, sociodemographic factors, and baseline levels of anti-smoking sentiment (vote on Q1 in 1993).
- n Multilevel analytic approach that accounts for clustering within towns and explicitly models a random town effect on each outcome



Results to date:

- n Town-level vote on Question 1 (the 1993 tobacco tax referendum) was a function of town education level, smoking prevalence and support for tobacco control policies. Hence is a good control for pre-existing anti-tobacco sentiment.



Restaurant/bar smoking regs:

- n At baseline

- n Stronger regs are associated with lower exposure to second-hand smoke among adults and youth.
 - n Strong regs affect youth's perceptions of adult smoking prevalence and social acceptability of adult smoking in their towns.



Restaurant/bar smoking regs:

- n At baseline stronger regs are associated with:
 - n lower exposure to second-hand smoke among adults and youth.
 - n youth's perceptions of lower adult smoking prevalence and lower acceptability of adult smoking in their towns.
 - n adult's perceptions of support for bans.



Preliminary longitudinal analyses

- n Strong restaurant/bar regulations at baseline are associated with a significant reduction in progression to established smoking among youth over two years.

O.R. = 0.59,

95% CI: 0.38,0.92



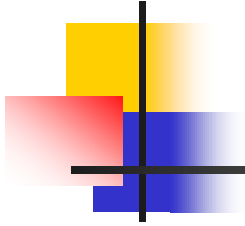
Stay tuned:

- n Impact of youth access regulations on perceived norms and on smoking behavior .
- n Impact of reported media exposure on norms and on smoking.
- n Relative impact of clean indoor air , youth access and mass media.



Published articles on media

- n Siegel, M. and L. Biener . 2000. The impact of an antismoking media campaign on progression to established smoking: Results of a longitudinal youth study. American Journal of Public Health 90:380-386.
- n Biener , L., McCallum-Keeler , G., & Nyman, A. L. 2000. Adults' response to Massachusetts Antitobacco Television Advertisements: Impact of viewer and ad characteristics. Tobacco Control 9:401-407 .
- n Biener , L. 2002. Adult and youth response to the Massachusetts anti-tobacco television campaign. J Public Health Management & Practice 3:40-44.

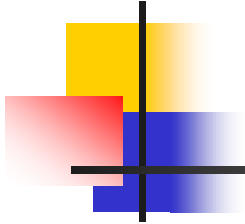


- n Biener , L. 2002. Anti-tobacco advertisements by Massachusetts and Philip Morris: What teenagers think. Tobacco Control 11:ii43-ii46.
- n Biener , L., and Taylor , T.M. 2002. The continuing importance of emotion in tobacco control media campaigns: a response to Hastings and MacFadyen. Tobacco Control 11:76-77.
- n Biener , L. Ji, M., Gilpin, E and Albers, A.B. (2004). The impact of emotional tone, message and broadcast parameters in youth anti-smoking advertisements. Journal of Health Communication, 9: 259-274.



Published articles on clean indoor air

- n Skeer M, Siegel M. The descriptive epidemiology of local restaurant smoking regulations in Massachusetts: an analysis of the protection of restaurant customers and workers. *Tob Control*. 2003 Jun;12(2):221-6.
- n Skeer M, George S, Hamilton W, Cheng D, Siegel M. Town-Level Characteristics and Smoking Policy Adoption in Massachusetts: Are Local Restaurant Smoking Regulations Fostering Disparities in Health Protection? *AJPH*, 2004; 94: 286 - 292.
- n Siegel M, Albers AB, Cheng D, Biener L, Rigotti NA. Effect of Local Restaurant Smoking Regulations on Environmental Tobacco Smoke Exposure Among Youths. *AJPH*, 2004; 94: 321 - 325.



- n Albers AB, Siegel M, Cheng D, Rigotti NA, Biener L. Effect of Restaurant and Bar Smoking Regulations on Exposure to Environmental Tobacco Smoke Among Massachusetts Adults. *Am J Public Health*, Nov 2004; 94: 1959 - 1964.

- n Albers AB, Siegel M, Cheng D, Biener L, Rigotti NA. Relation between local restaurant smoking regulations and attitudes towards the prevalence and social acceptability of smoking: a study of youths and adults who eat out predominantly at restaurants in their town. *Tob Control*. 2004 Dec;13(4):347-55.



Published articles on youth access

- n Thomson C, et al. Lack of association between community-level youth access ordinances and adolescents' perceived access to tobacco products, purchase attempts, and smoking behavior. *Journal of Public Health Management and Practice*, 2004.