

# Developing Policy Measures for Obesity, Diet, and Physical Activity

**Frank J. Chaloupka**

**University of Illinois at Chicago**

**Co-Director, RWJF Bridging the Gap Program**

***Special thanks to Jamie Chriqui, UIC***

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# Overview

- Brief introduction to the Bridging the Gap program
- Providing some context: Examples of policy measures and policy impact from tobacco
- Efforts to develop state and local policy measures for obesity, diet, and physical activity
  - NCI state policy systems
  - BTG state policy system
  - HER/BTG district wellness policy collection/coding
- Planned future policy measure development and analyses
- Recommendations

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**Bridging the Gap**  
Research Informing Practice and  
Policy for Healthy Youth  
Behavior

Guest Editors

Frank J. Chaloupka, Lloyd D. Johnston, Ross C. Brownson,  
and Antronette K. Yancey

# Bridging the Gap is ...

- An cross team initiative of the Robert Wood Johnson Foundation
  - began with Tobacco & Alcohol & Other Drugs teams
  - More recently supported by the Childhood Obesity Team
- A collaborative effort to assess the impacts of policies, programs, & other environmental factors on adolescent health behaviors including diet, physical activity, and weight outcomes
  - Multidisciplinary, multi-site team of investigators
  - Original and archival data on national, state, community, and school-level influences
- Linked to the ongoing *Monitoring the Future* study
- 2 major components: YES! And ImpacTeen projects

**Providing some context:**

**Examples from tobacco  
control policy  
measurement and  
impact studies**

# What lessons have we learned from tobacco control?

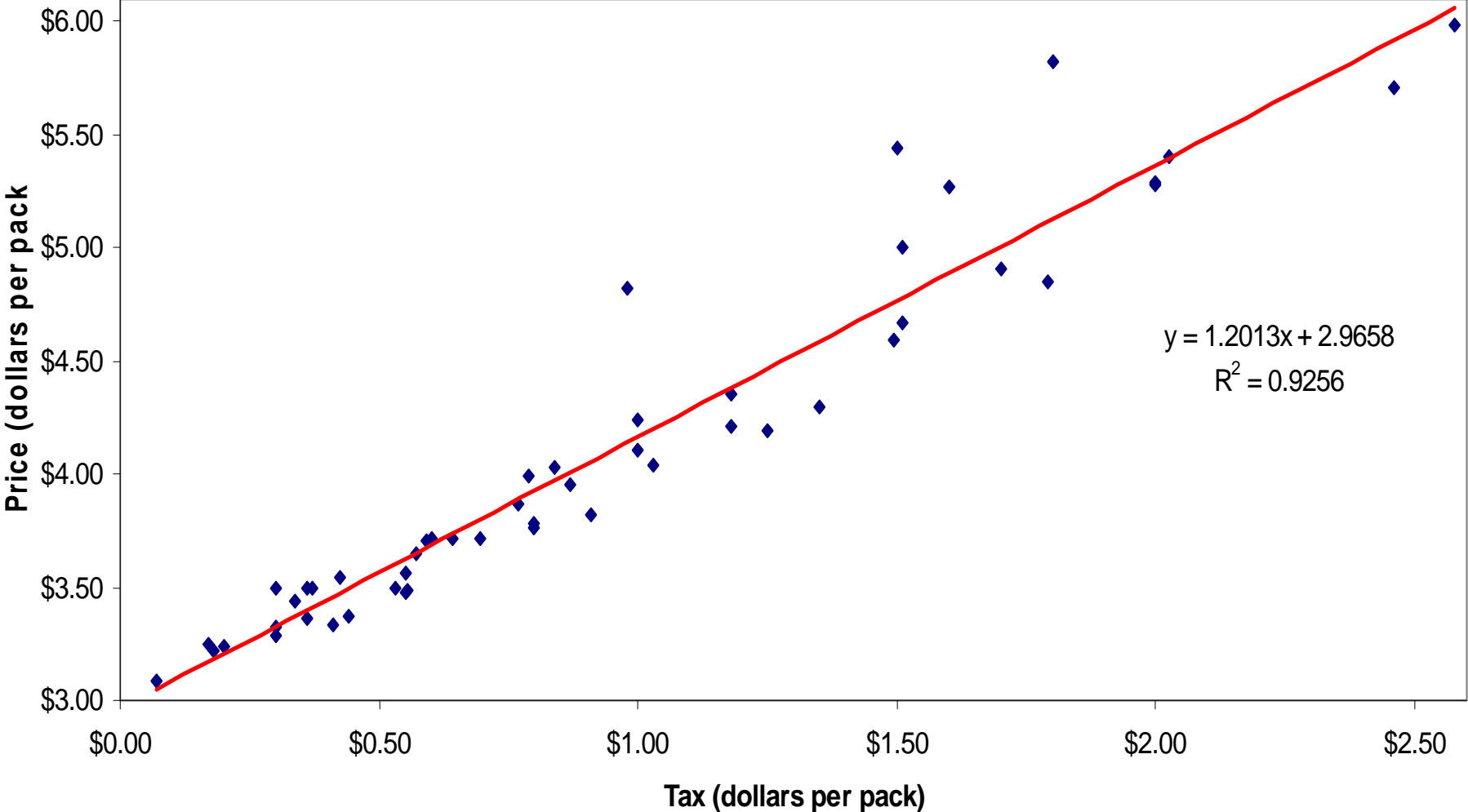
- Many years of experience collecting, assessing, and evaluating the impact of public policies on tobacco use and its consequences
  - NCI (SCLD), CDC (STATE), ALA (SLATI), CTFK, ANRF, MayaTech, BTG
- Tobacco control policies focus on both supply and demand issues
  - taxation and pricing
  - smoke-free air policies
  - youth purchase/use/possession
  - State tobacco control program funding
  - Direct sales policies
  - others

# “What gets measured, gets changed”

- Evidence from tobacco control indicates that once the field started to systematically and reliably analyze and document policies (variations across jurisdictions and changes over time), it became possible to evaluate the impact of the policies on aggregate and individual-level measures of tobacco use

***Findings from this research critical to policy makers, public health professionals, and tobacco control advocates in increasing strength and comprehensiveness of tobacco control policies over past 10-15 years***

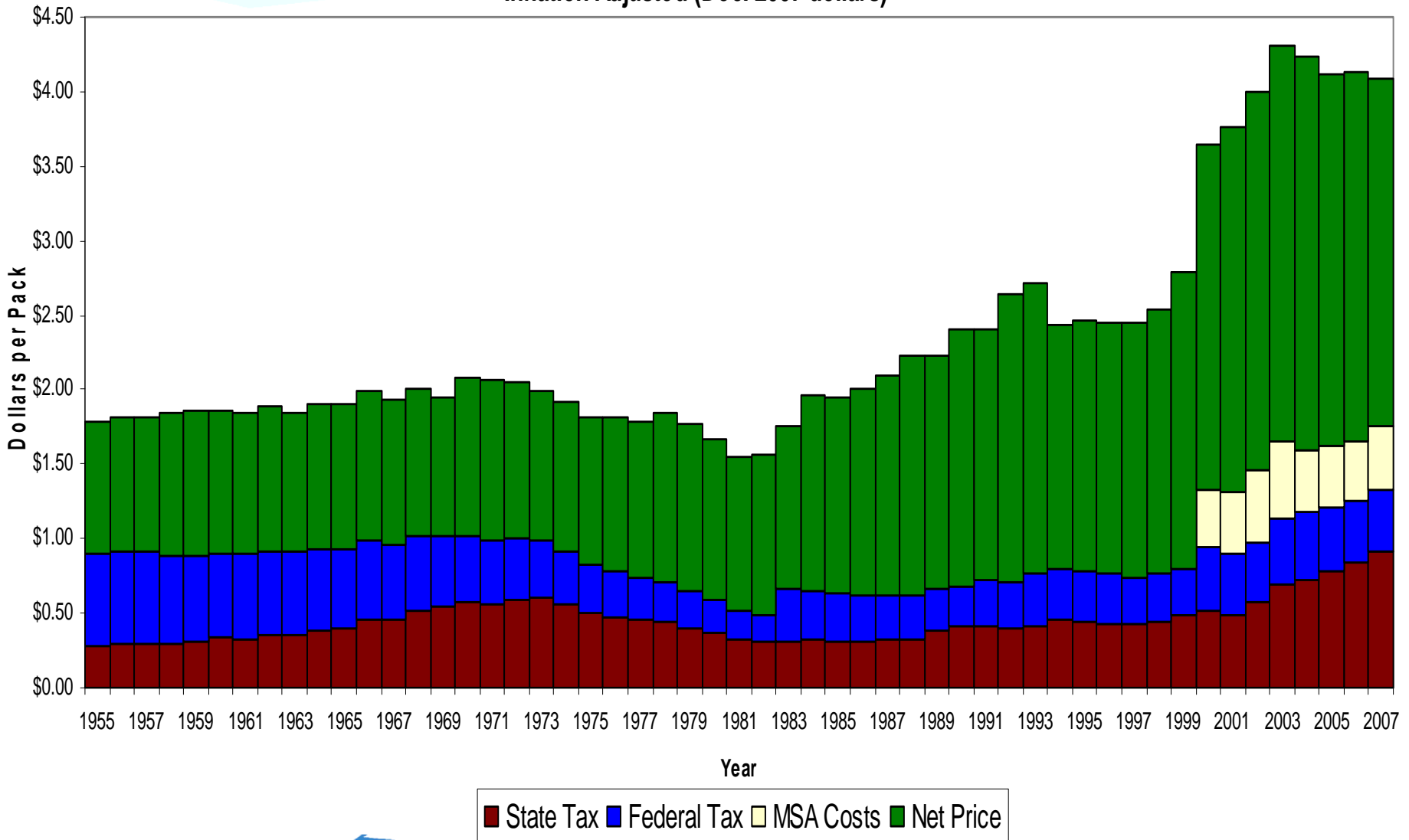
# State Cigarette Taxes and Prices, November 1, 2006



$y = 1.2013x + 2.9658$   
 $R^2 = 0.9256$

# Cigarette Taxes and Prices, 1976-2007

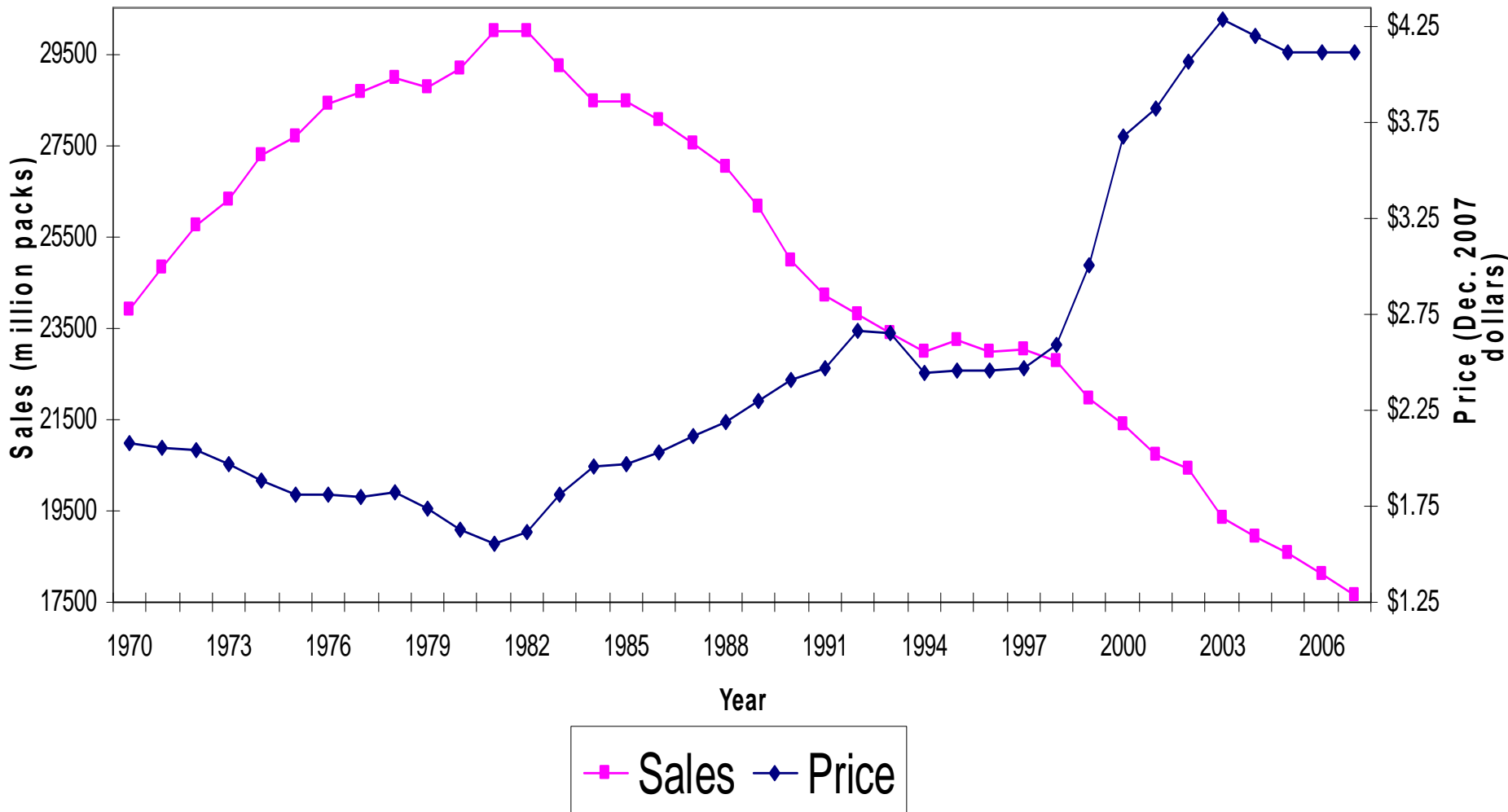
Inflation Adjusted (Dec. 2007 dollars)



Source: *Tax Burden on Tobacco, 2007*, and author's calculations

# Cigarette Prices and Cigarette Sales

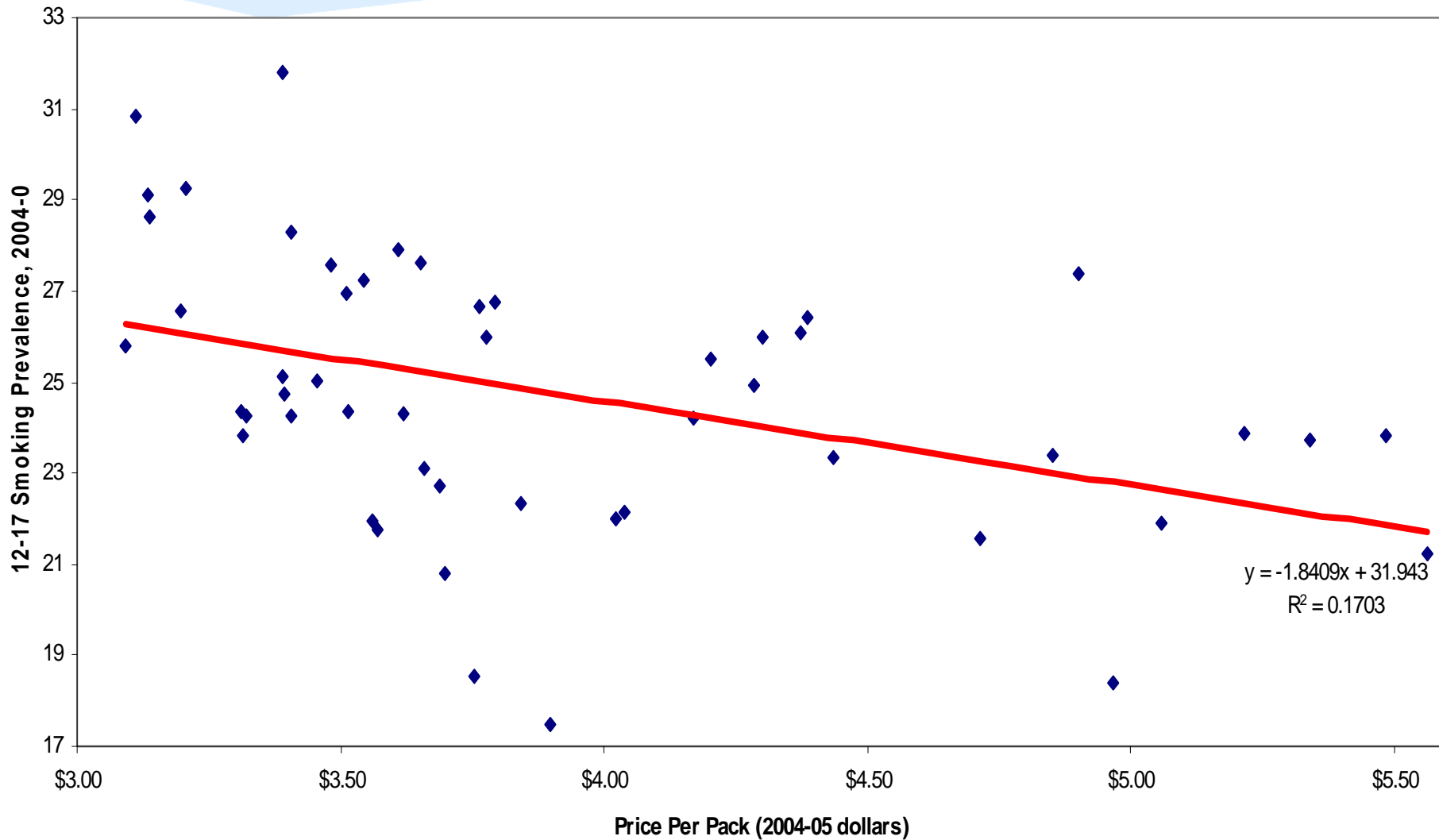
## United States, 1970-2007



Source: *Tax Burden on Tobacco, 2007*, and author's calculations

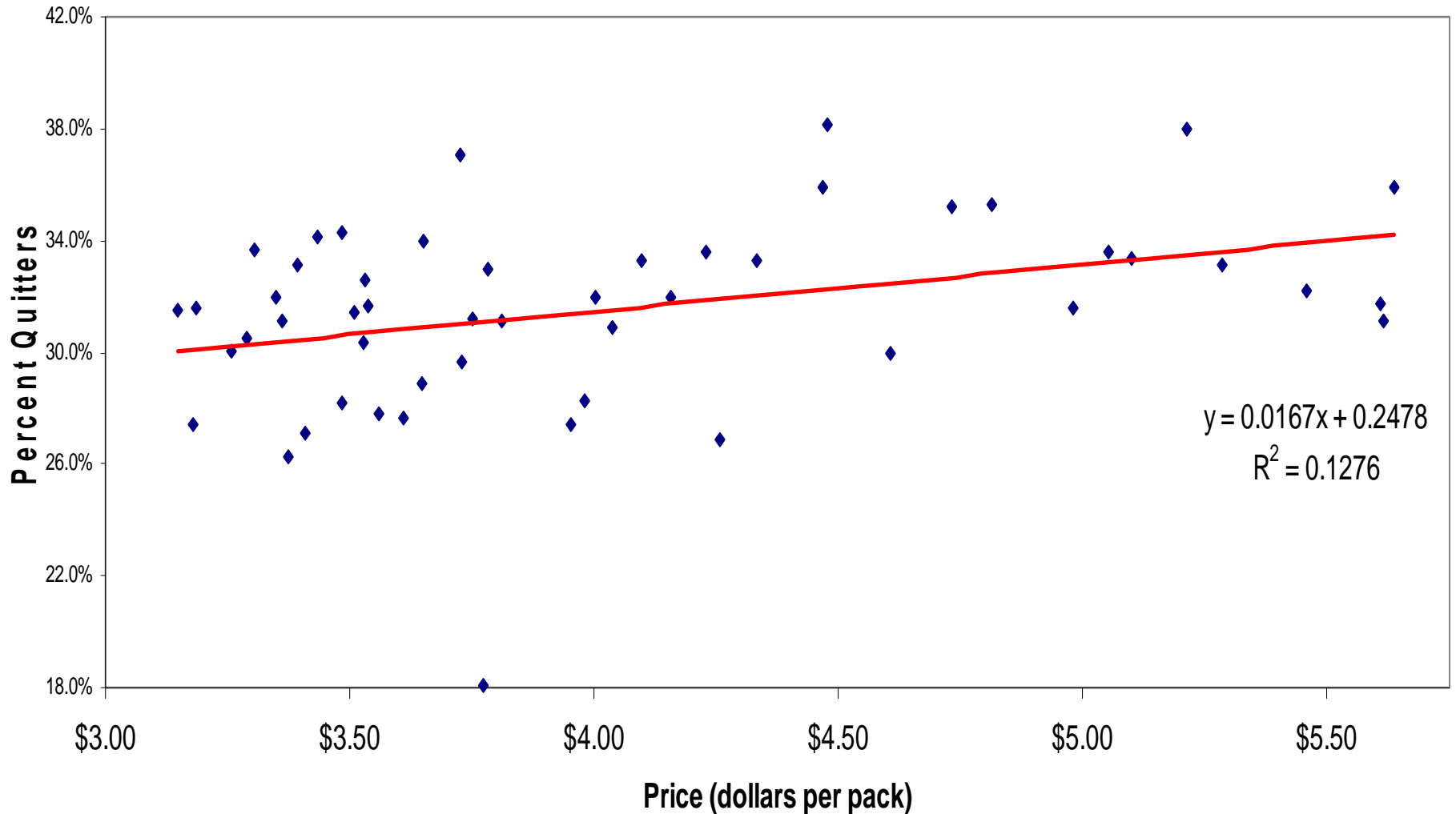
# Cigarette Prices and Adult (26+) Smoking Prevalence

## US State-Level Data, 2004-05



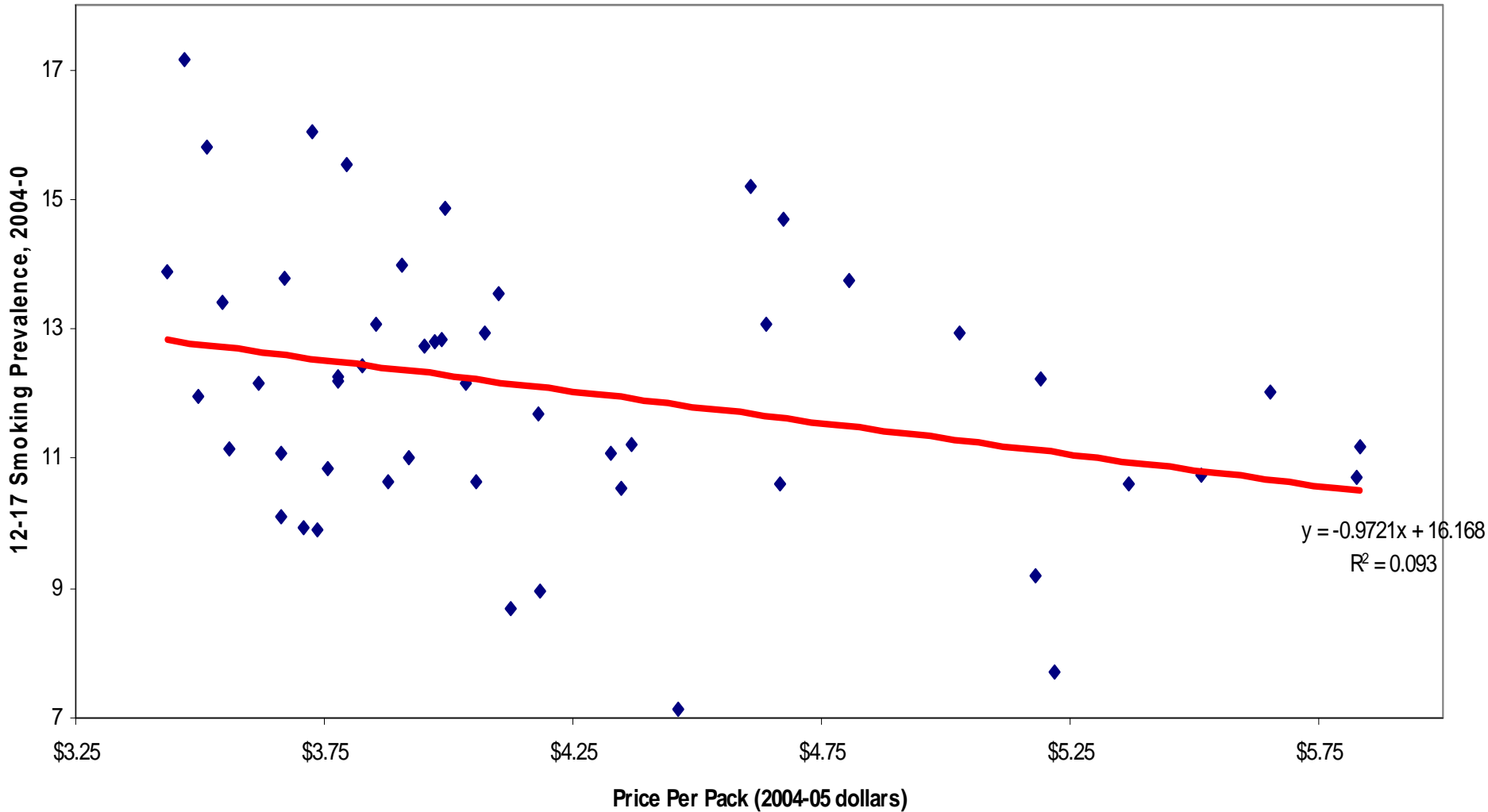
$y = -1.8409x + 31.943$   
 $R^2 = 0.1703$

# Cigarette Prices and Percentage of Ever Smokers Who Have Quit Smoking



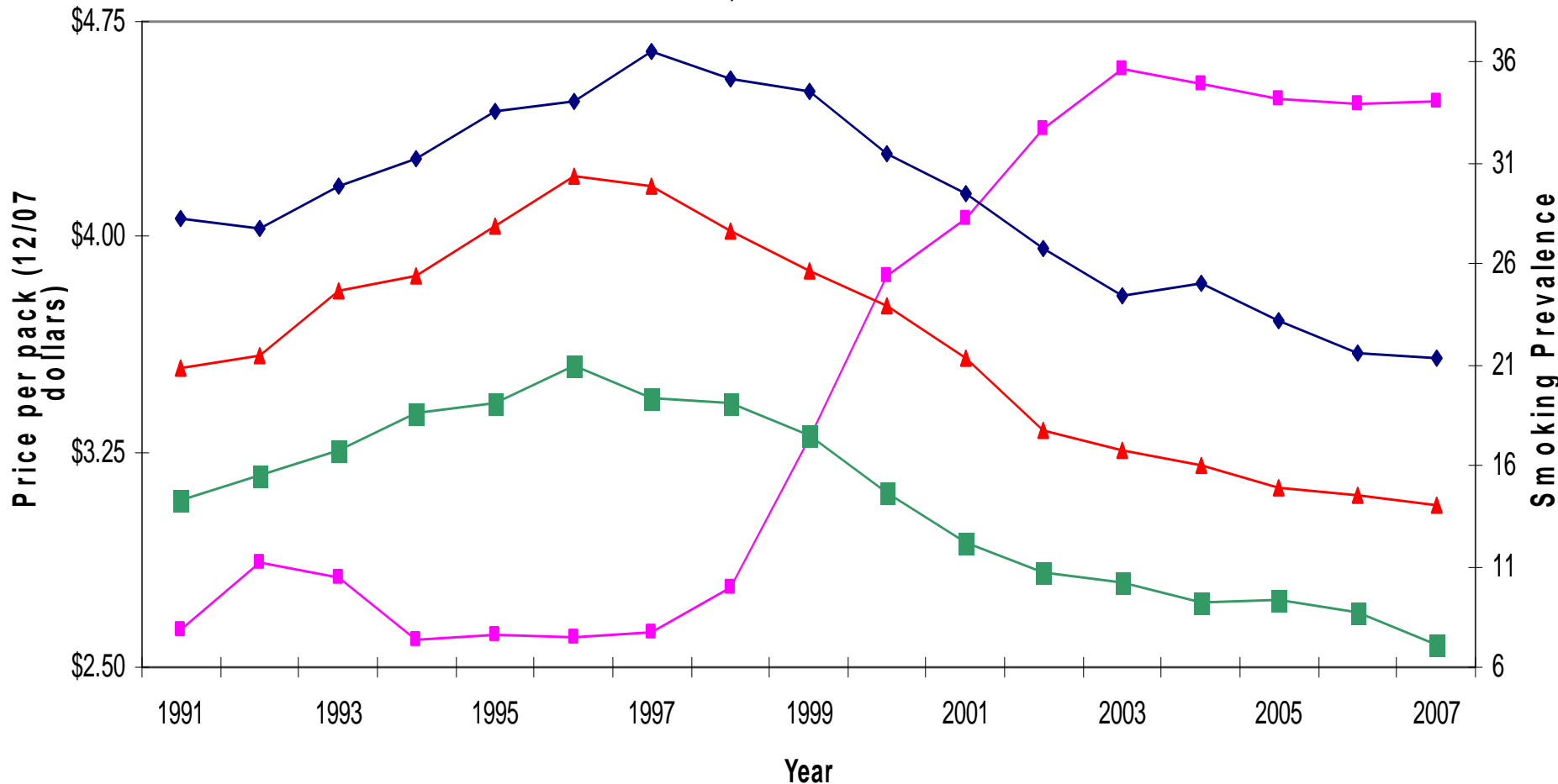
$y = 0.0167x + 0.2478$   
 $R^2 = 0.1276$

# Cigarette Prices and Smoking Prevalence Ages 12-17, State-Level Data, 2004-05



$y = -0.9721x + 16.168$   
 $R^2 = 0.093$

# Cigarette Price and Youth Smoking Prevalence, United States, 1991-2007

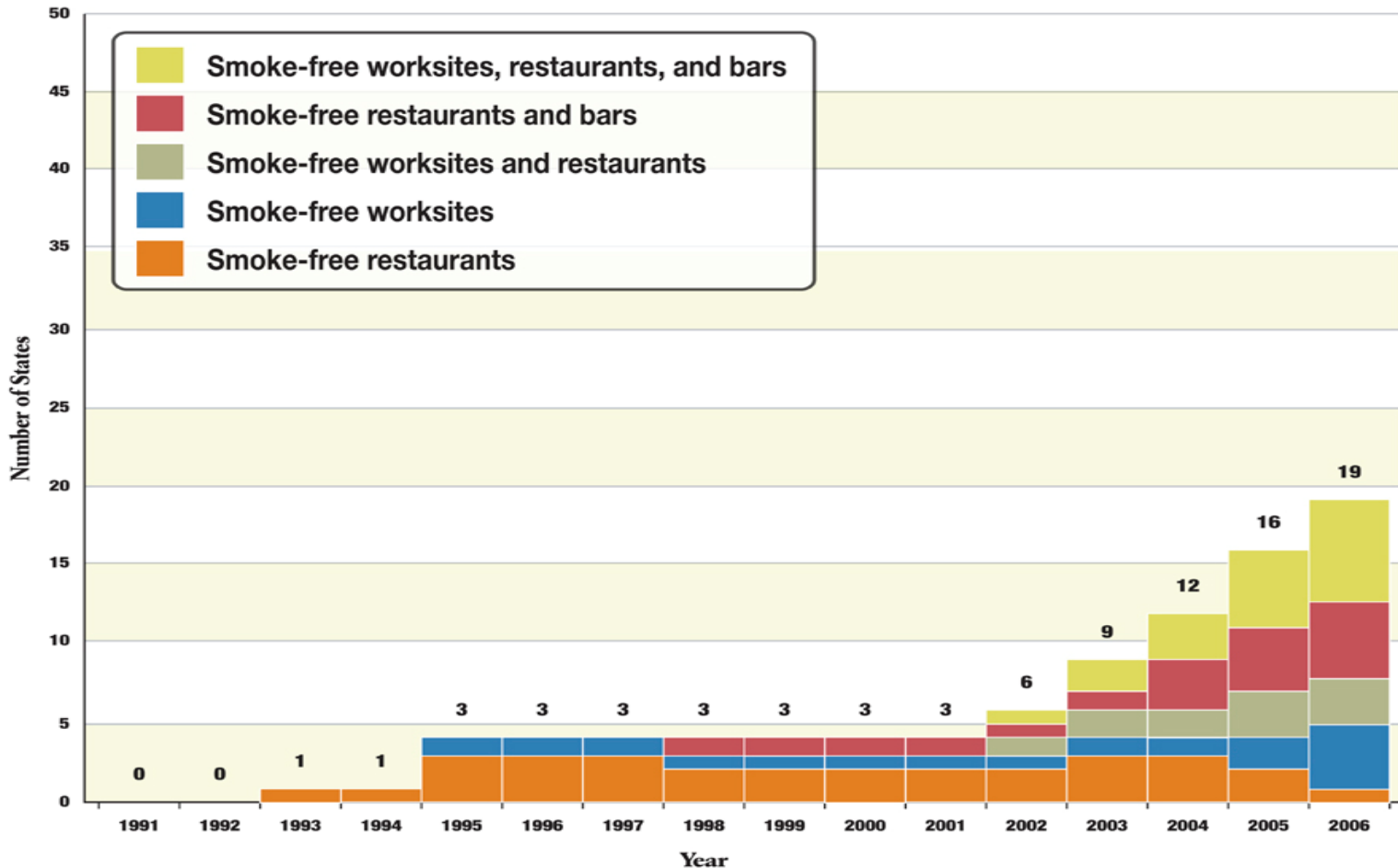


■ Cigarette Price 
 ◆ 12th grade prevalence 
 ▲ 10th grade prevalence 
 ■ 8th grade prevalence



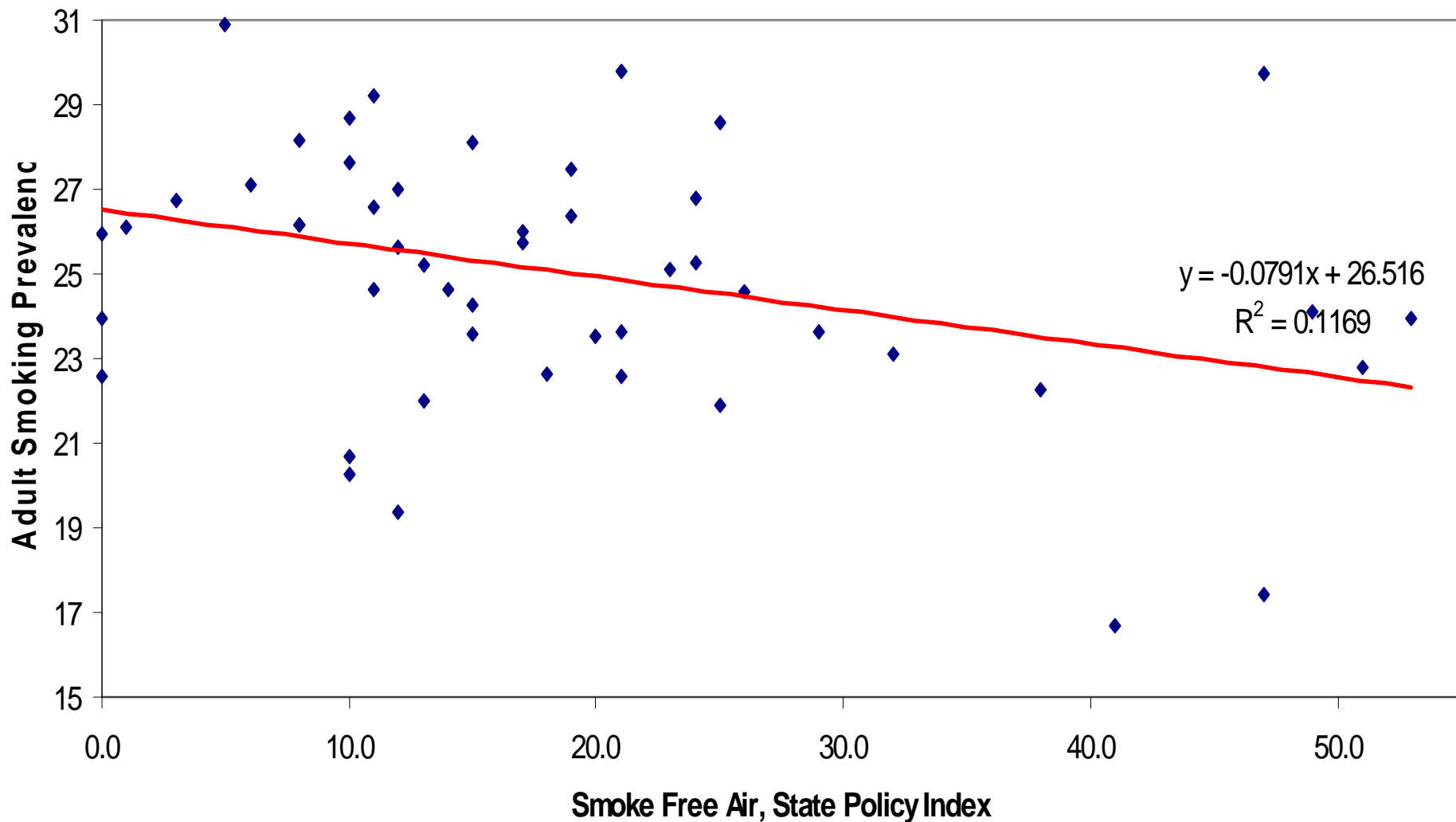
Source: MTF, *Tax Burden on Tobacco*, 2007, and author's calculations

# Major Smoke-Free Air Legislation in the 50 States and the District of Columbia - 1991-2006



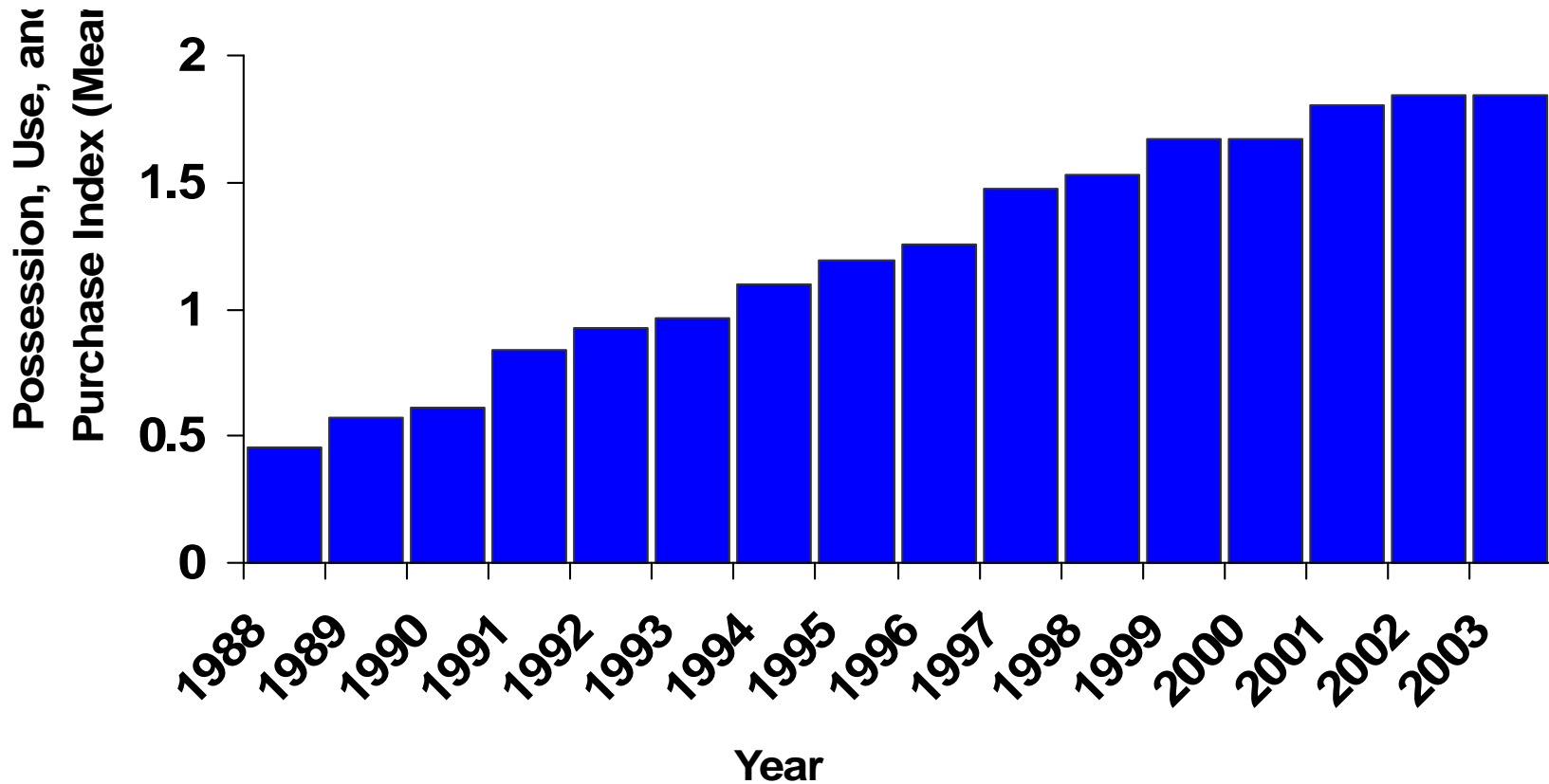
Source: The MayaTech Corporation and the Roswell Park Cancer Institute; includes laws effective July 1, 2006.

# Smoke Free Air Policies and Adult Smoking Prevalence, 2003-04



$y = -0.0791x + 26.516$   
 $R^2 = 0.1169$

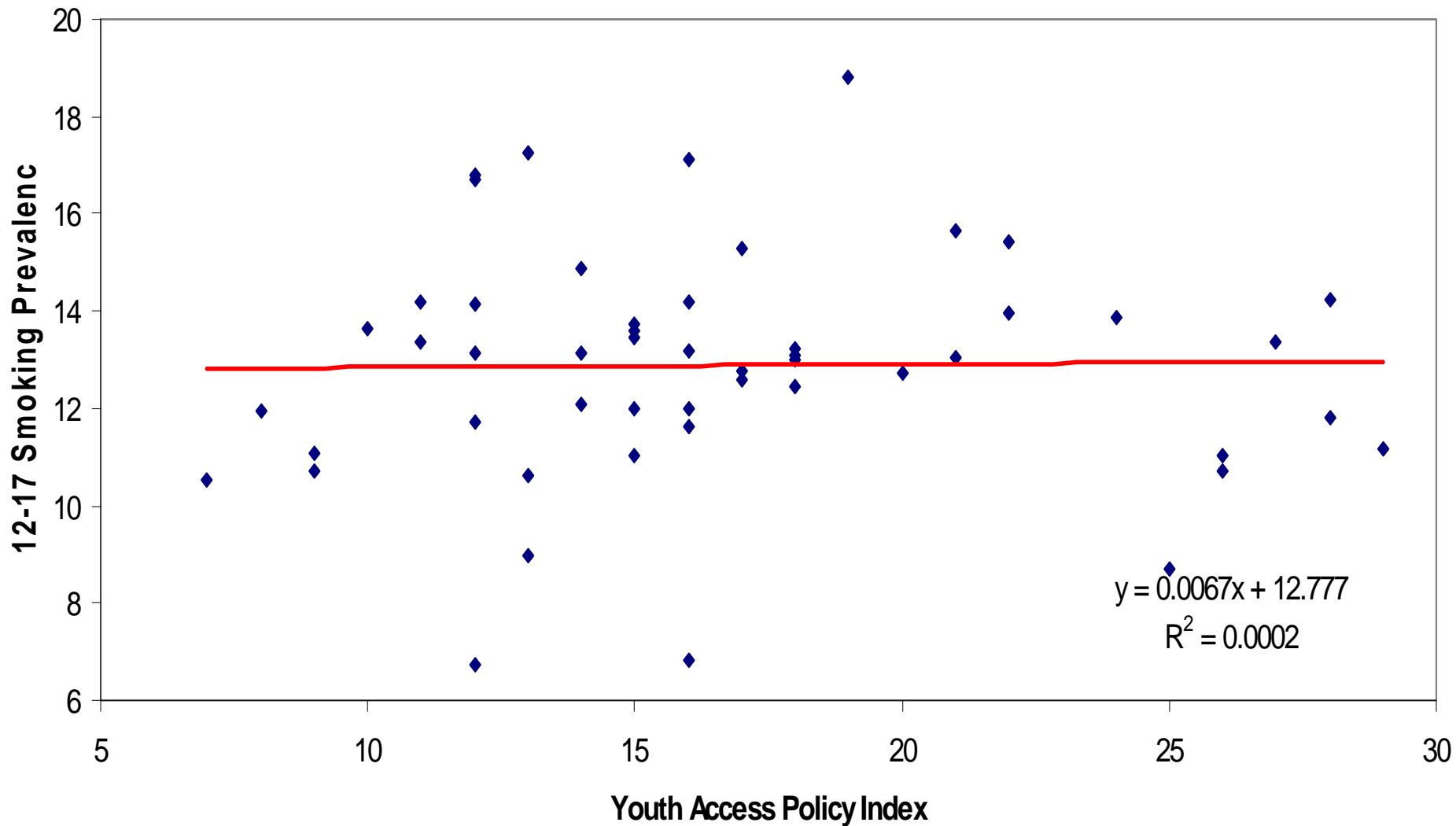
# Mean Number of Possession, Use, and Purchase Laws per State\* -- United States, 1988-2003\*\*



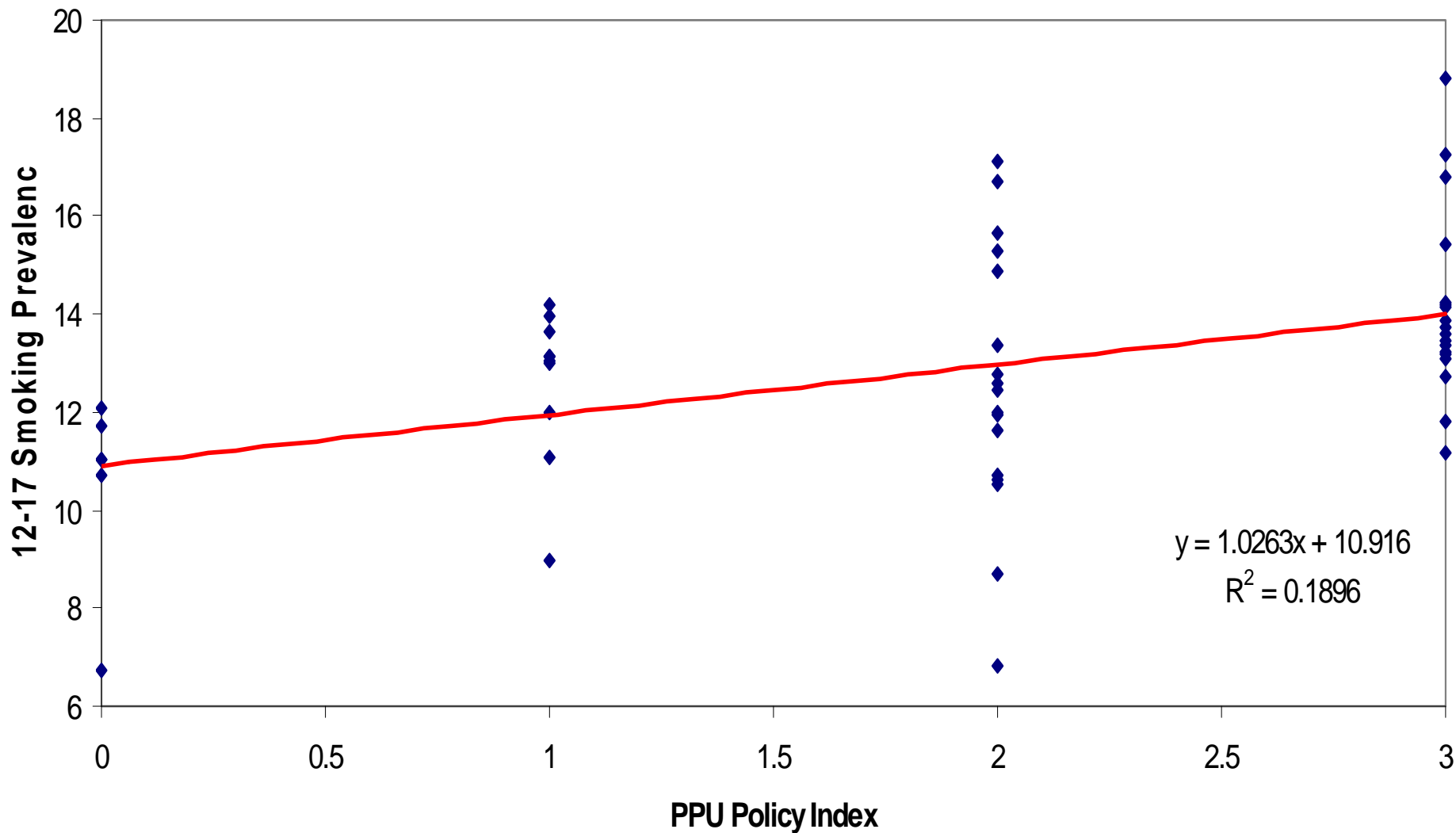
\*Includes the District of Columbia; Theoretical Range = 0-3; Includes 1<sup>st</sup> quarter of 2003 only.

\*\*Sources: ALA's SLATI, CDC's STATE system, and Roswell Park Cancer Institute

# Youth Access Policies and Youth Smoking Prevalence 2003-04



# Purchase, Possession and Use Policies and Youth Smoking Prevalence, 2003-04



Source: NSDUH, Mayatech & RPCI, and author's calculations

**Efforts to develop state  
and local policy  
measures for obesity,  
diet, and physical  
activity**

# State Policy Measurement

- **National Cancer Institute State Policy Classification Systems**
  - Focus on state-level policies affecting the school environment
    - Physical education policies
    - School-based nutrition policies
  - Developed by NCI and The MayaTech Corporation based on input from expert advisors and consultants
  - “Policies” defined to include state statutory and administrative laws
    - public policies that have the full force of law;
    - laws developed by state legislatures and regulations developed by executive agencies

# State Policy Measurement: NCI Systems continued

- **NCI Policy classification system development**
  - Recommendations from panel of scientific, topical, and policy/advocacy experts
  - Review of best available data and science
    - Federal Government guidelines (e.g., U.S. Dietary Guidelines)
    - Expert recommendations (e.g., IOM panels)
  - Review of most comprehensive state laws and emerging laws
  - Pilot tested systems using laws from 5-10 states with extensive policies

# State Policy Measurement: NCI Systems continued

## PE System Topics

1. Minimum time reqs.\*
2. PE staffing reqs.\*
3. Curriculum standards\*
4. Assessment of health-related fitness\*
5. Recess (ES only)

\*Grade-level coding (ES/MS/HS)

## Nutrition System Topics

1. A la carte F&B sales\*
2. Vending machine\*
3. Other venues\*
4. Reimbursable school meals\*
5. School meal environment
6. Food service director reqs.
7. Nutrition education\*
8. Advertising/promotion
9. Preferential pricing
10. Coordinating/advisory council
11. BMI screening/reporting

Note: additional dichotomous tracking variables to measure potential enhancement/inhibiting factors also captured in both systems.

# State Policy Measurement: NCI Systems continued

- **Current and planned efforts**

- Initial NCI metrics published as part of AJPM supplement
  - Physical education and School-based Nutrition
- Baseline data (as of 12/31/03) posted on NCI Web site along with codebook, policy classification tool, etc.

[http://dccps.nci.nih.gov/hprb/data\\_systems.html](http://dccps.nci.nih.gov/hprb/data_systems.html)

- NCI is currently funding MayaTech to update the data through 2008, using annual reference dates of December 31.
- NCI/MayaTech are working with Tracy Fox to update the school-based nutrition metric to build on the IOM (2007) recommendations on nutrition in schools

# http://dccps.nci.nih.gov/hprb/data\_systems.html

DCCPS: HPRB: State Physical Education and Recess and School Nutrition Environment Policy Classi - Windows Internet Explorer

http://dccps.nci.nih.gov/hprb/data\_systems.html

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DCCPS: HPRB: State Physical Education and Recess a...

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Cancer Control and Population Sciences

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### State Physical Education and Recess and School Nutrition Environment Policy Classification Systems and Data

Search:

The National Cancer Institute (NCI), working with expert consultants including staff at the Centers for Disease Control and Prevention and through contracts with The MayaTech Corporation, developed two systems for classifying state level physical education and recess and school nutrition environment-related policies. Policies are defined to include both statutory and administrative laws. An initial baseline coding of relevant state policies was conducted for laws in effect as of December 31, 2003. Efforts currently are underway to extend these data through 2007. This Web site provides access to the baseline 2003 data and the associated code books, copies of the policy classification systems, and citations for two manuscripts that describe the classification system development process in detail.

[Physical Education and Recess State Policy Classification System and Data](#)

[School Nutrition Environment State Policy Classification System and Data](#)

"[Bridging the Gap: Research Informing Practice and Policy for Healthy Youth Behavior](#)," a supplement to the *American Journal of Preventive Medicine*

For additional information about this site and the policy classification system, please contact Dr. Tanya Agurs-Collins at [collinsta@mail.nih.gov](mailto:collinsta@mail.nih.gov)

Last Updated September 17, 2007

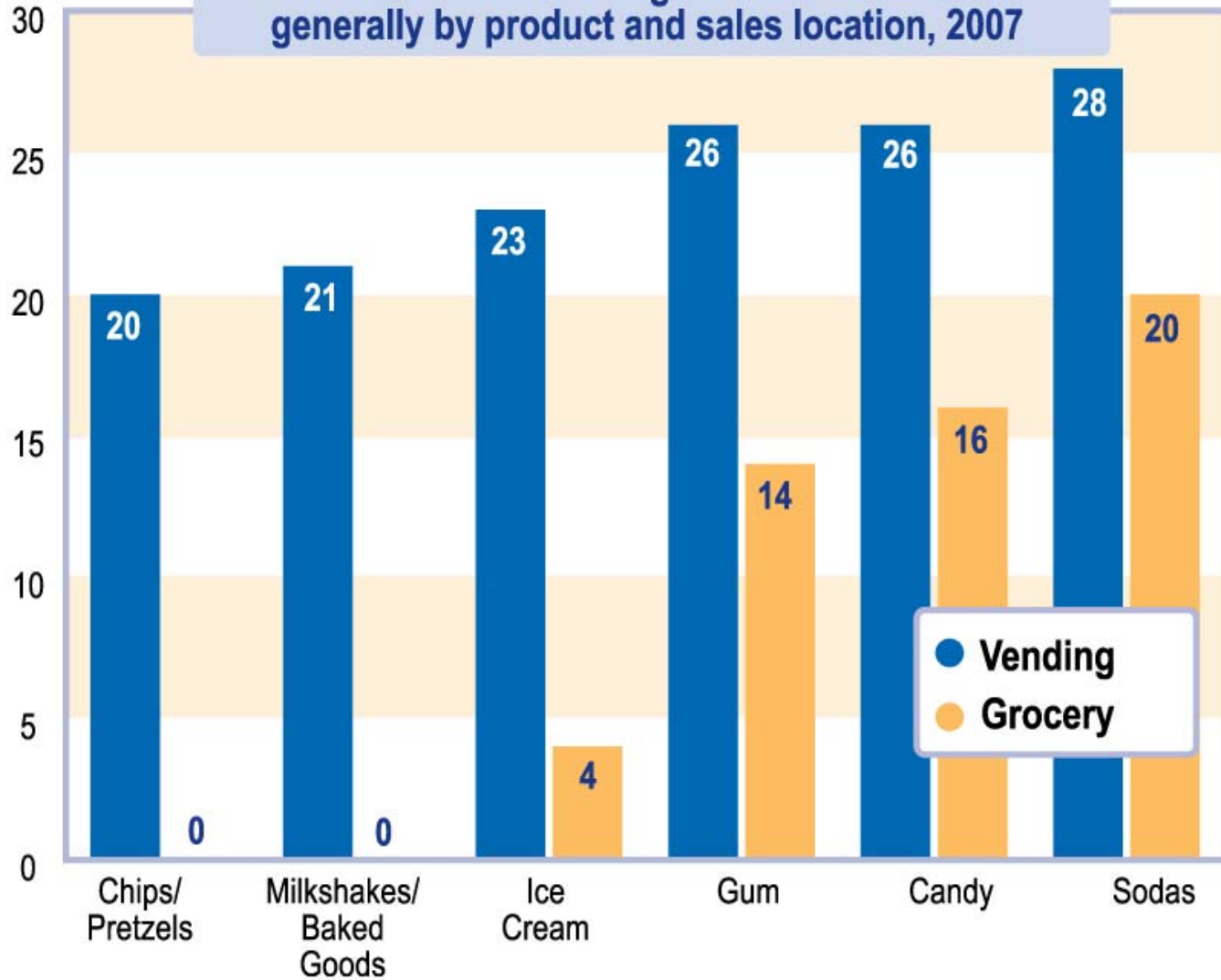
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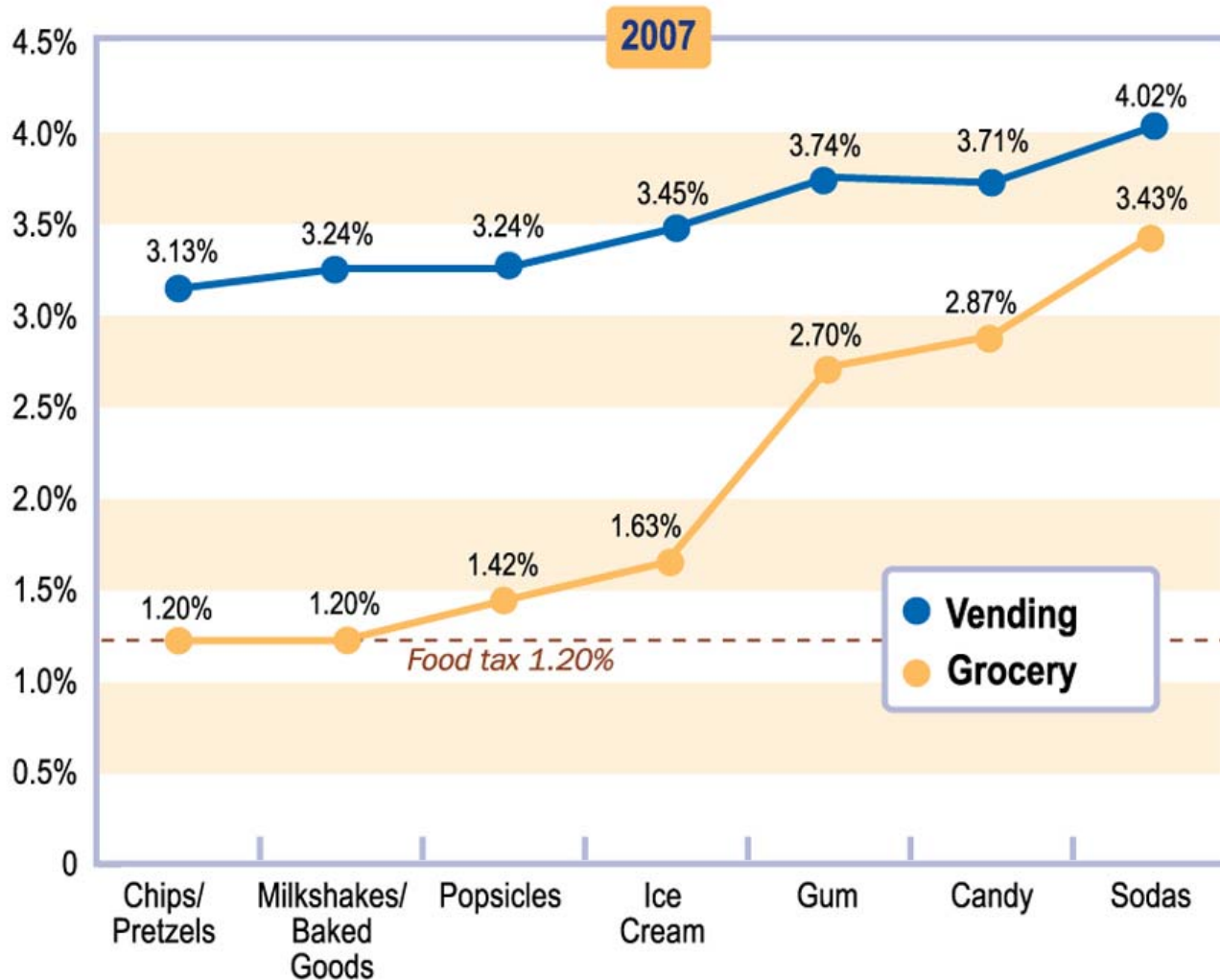
# Additional State Policy Measurement

- As part of BTG, new state-level policy data being compiled by UIC and MayaTech to complement NCI data
  - State sales tax rates for snacks and sodas sold through grocery stores and vending machines
    - Annual data compiled for 1/1/97 through 1/1/07
    - Descriptive manuscript regarding the 2007 data in press at *Journal of Public Health Policy*
- Work in progress (1/1/07 reference date)
  - State sales tax rates for restaurants, fast food/carryout
  - State level laws regarding safe routes to school
  - Statutory/administrative law mandates/frameworks for local wellness policies (different from model policies/guidelines)
    - Baselines likely to vary depending on policy domain

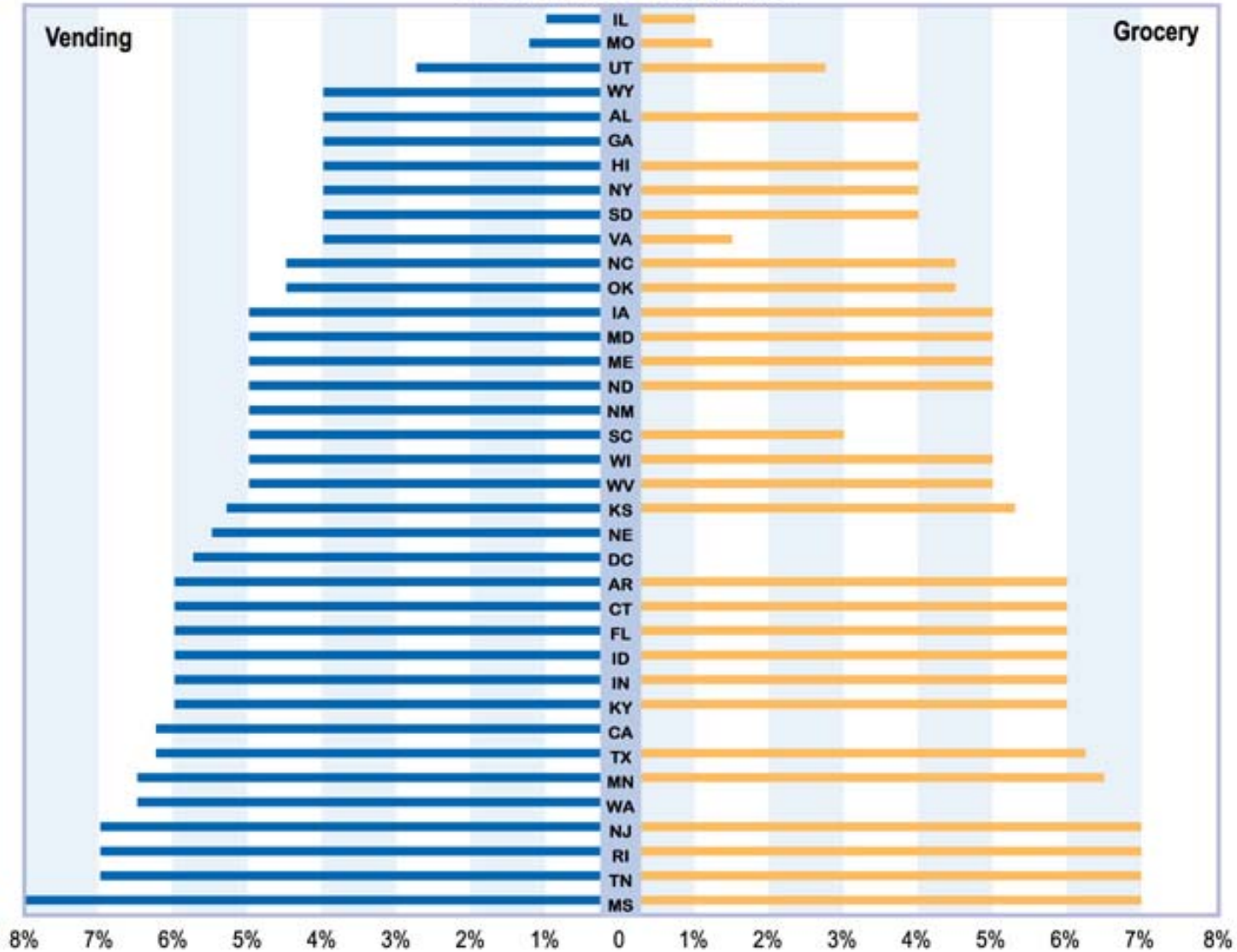
Number of states with higher sales tax than food generally by product and sales location, 2007



# State sales tax rates for selected snacks and sodas by sales location, 2007

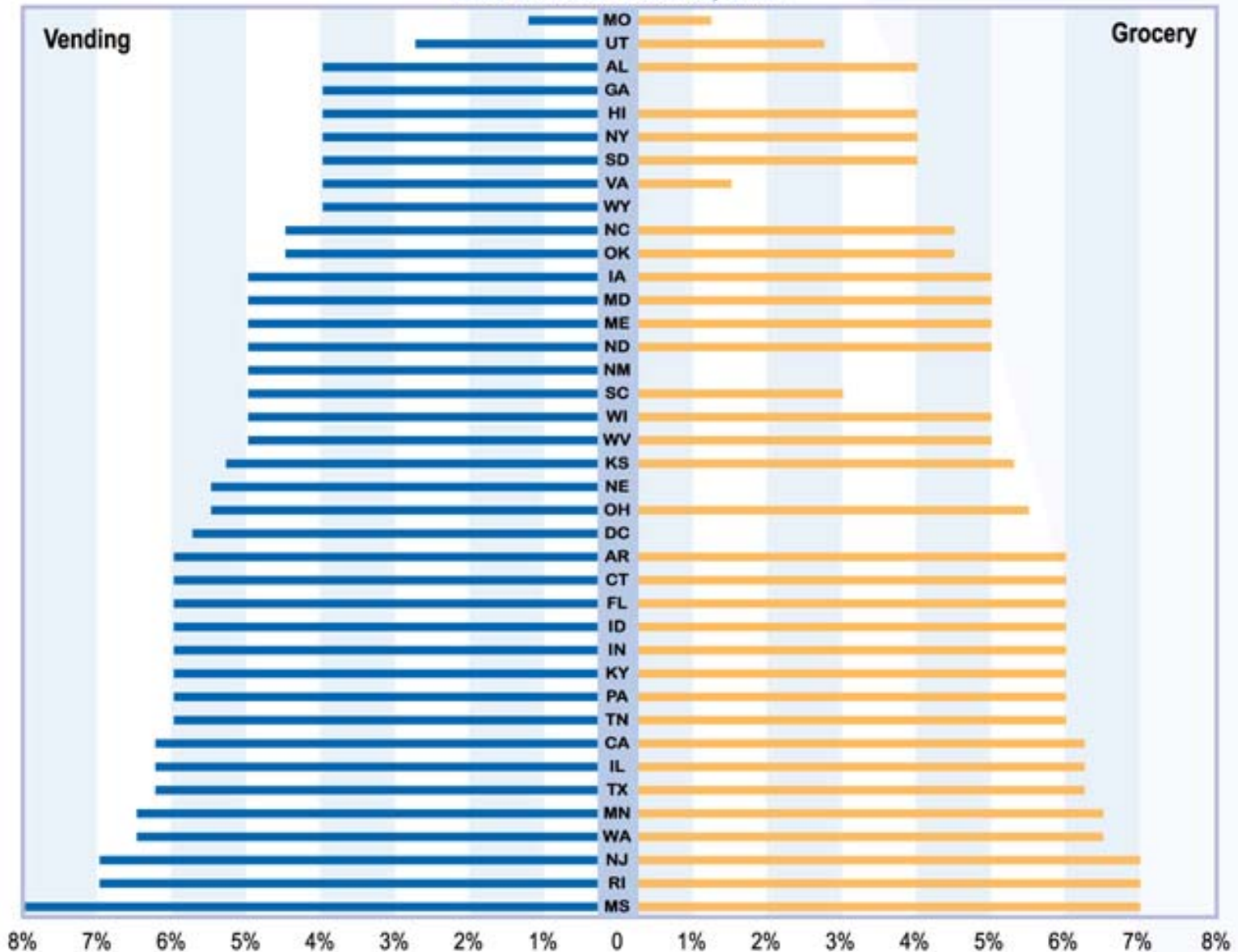


### Sales tax rates for candy, 1/1/07



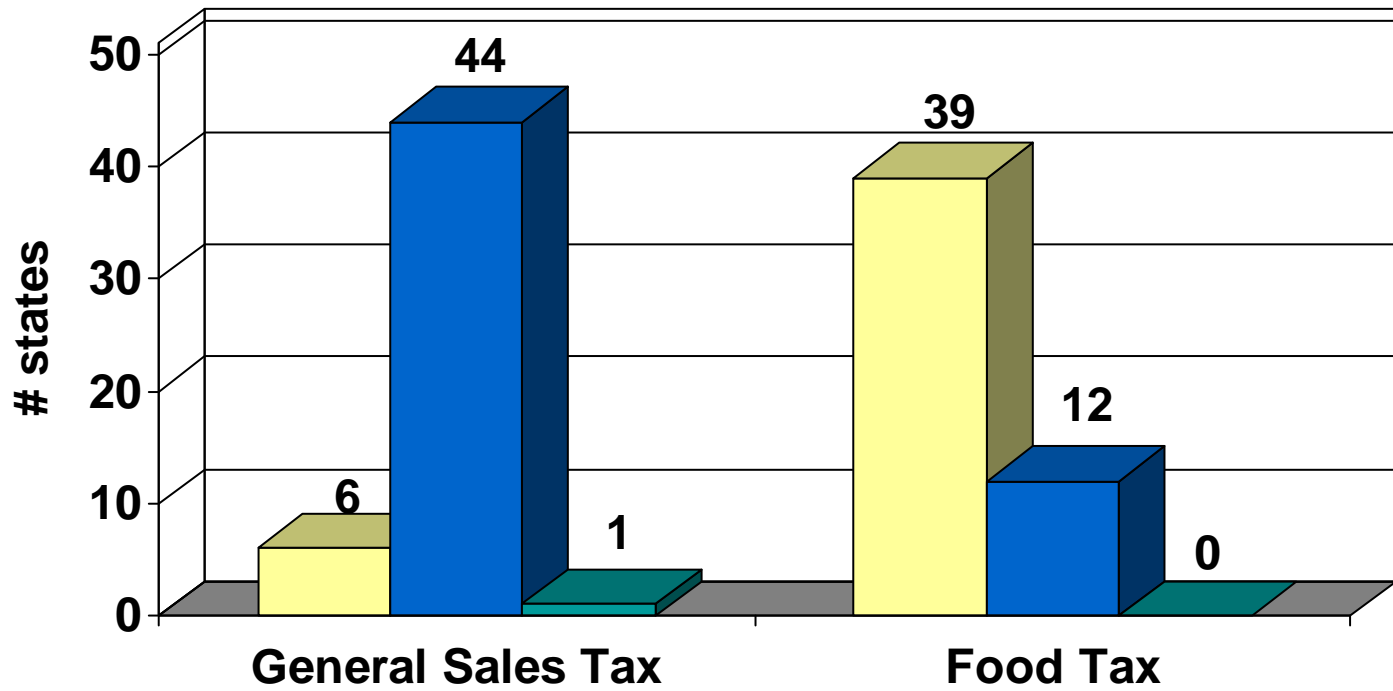
The following states do not impose a sales tax on candy for vending/grocery sales:  
 AK, AZ, CO, DE, LA, MA, MI, MT, NH, NV, OH, OR, and PA.

### Sales tax rates for sodas, 1/1/07



The following states do not impose a sales tax on sodas for vending/grocery sales:  
 AK, AZ, CO, DE, LA, MA, MI, MT, NH, NV, OR, and VT.

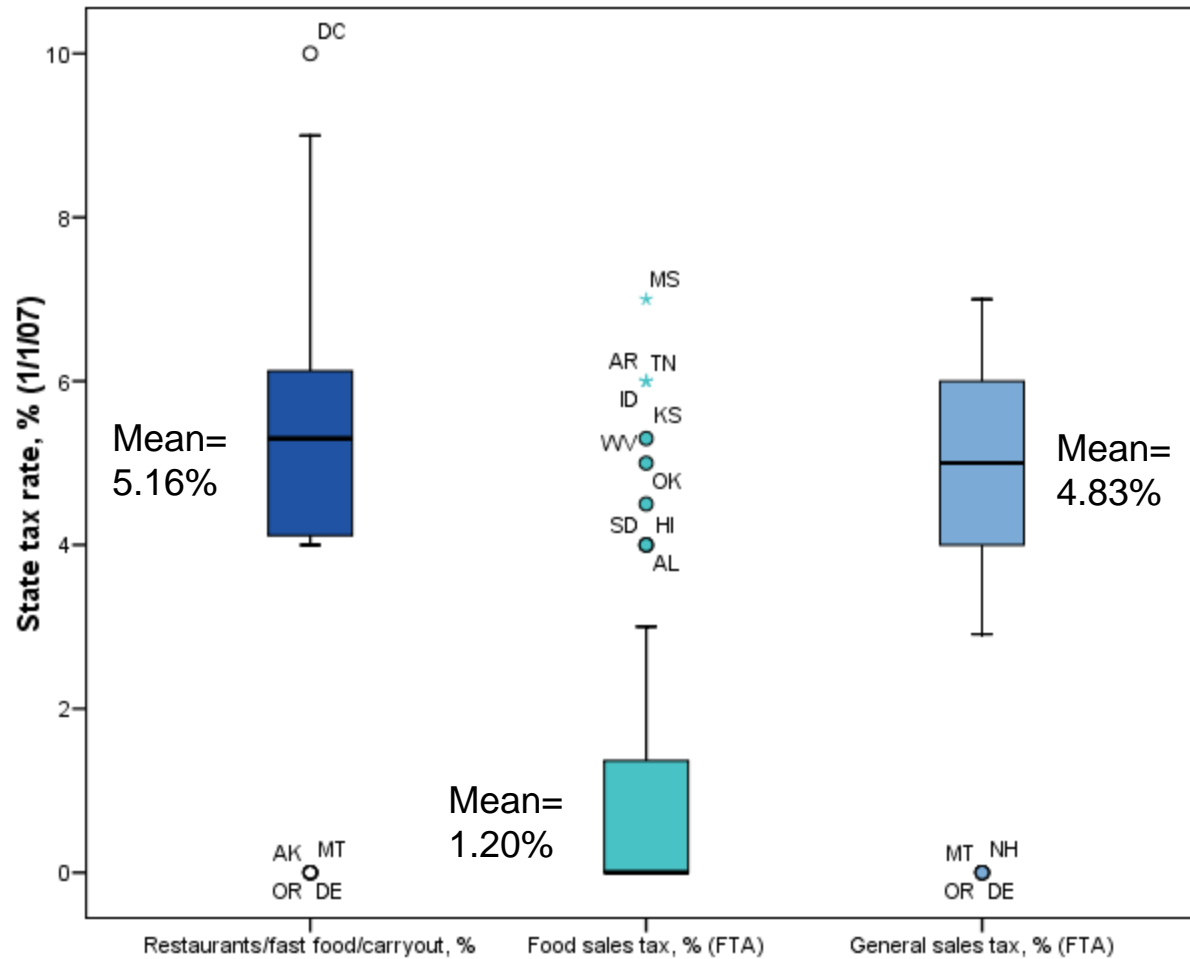
# Restaurant Tax Data (as of 1/1/07)



Restaurant tax vs. general sales/food tax

Rest tax > Rest tax = Rest tax <

# State tax rates as of 1/1/07: Restaurant, etc. tax vs. general food tax & general sales tax



# Policy Research Example: Food Pricing and Youth Behavior

- Find that:
  - youth in communities with lower fruit and vegetable prices have more frequent fruit & vegetable consumption and lower BMI
  - youth in communities with lower fast food prices have less frequent fruit & vegetable consumption, higher BMI, and are more likely to be overweight
    - *10 percent rise in fast food prices would increase probability of frequent F&V consumption by 3%, reduce BMI by 0.4% and lower probability of being overweight by 5.9%*

# Policy Research Example: Food Pricing and Youth Behavior

- Find that:

- *Impact of fast food and F&V prices greatest among most at risk youth (higher BMI)*

- Above 90<sup>th</sup> percentile, fast food price impact 4 times larger than average effect for full sample
- Above 95<sup>th</sup> percentile, fruit & vegetable price impact 5 times larger than average effect
- Little impact of prices at low/mid-ranges of BMI
- Supermarket availability inversely associated with BMI at all levels, with greater impact on upper end
- No associations between fast food and full service restaurant availability

# Safe Routes to School Policy Measurement

- Initial topics
  - SRTS Program Formality
  - SRTS Laws' Purpose, Administration, and Approval Process
  - Characteristics of Eligible Projects
  - Selection of Projects/Vetting Criteria
  - Other Relevant Laws Affecting Students' Ability to Walk or Bicycle to School
  - Federal funding for SRTS projects
- Development status
  - Engaging consultant from National Center for Safe Routes to School to review coding scheme
  - Baseline measurement of 1/1/07
  - Plan to compile annual data for 2005-2006 and prospectively starting with 2008

# Local Policy Measurement

- Local wellness policy measurement
  - Wellness policies mandated by Congress (P.L. 108-265) for all school districts participating in the National School Lunch Program
    - Policies needed to be in place by the 1<sup>st</sup> day of the school year following June 30, 2006
  - Tool for measuring variability in local wellness policies developed by Healthy Eating Research Grantees
    - Marlene Schwartz (Yale) has led this effort

# HER-developed Local Wellness Policy Coding Tool

- Parallels federally-mandated topics:
  - Nutrition education, reimbursable school meals, competitive food sales, physical activity/physical education, communications and marketing, and implementation and evaluation
- Incorporates many of the components of the NCI systems and systems developed by AFHK, NANA, and the Alliance for a Healthier Generation/Clinton Foundation
- 96-item coding tool (0/1/2 ordinal variables)
  - Initially tested by HER grantees on policies from school districts in CT, PA, MN, WA
  - Further refined by BTG researchers for use with a nationally-representative sample of school districts throughout the U.S. (N=580 districts)

# HER-developed Local Wellness Policy Coding Tool—UIC Adaptations to Facilitate Policy Evaluation Studies

- Adapt coding tool for measuring policy variance by grade-level (ES/MS/HS)
- Further refinement of competitive food variables to allow for policy nuances based on sale/serve “location” (i.e., a la carte, vending, school stores, fund raisers, parties, etc.)

# Other activities related to local policy measurement

- Physical activity section of the HER-developed scheme being utilized by ALR researchers and others to measure policy impact
- NCI pilot study to apply state-level classification systems to local district policies
  - Easily adaptable; creates parallel linkages between state/local policy data

# Lessons Learned in Developing Policy Measurement Systems

- **Measurement reliability is challenging**
  - Oftentimes, the policies are fairly complex and coding is highly subjective
  - NCI systems had fairly high inter-rater reliability; however, ICCs varied by topic
  - Individual coding often not feasible (<80% ICC's)
    - Be prepared to conduct consensus coding involving two or more coders to review each policy
  - Often must supplement the measurement system with coding-specific decision rules as new “nuances” will often appear with each policy reviewed

# Lessons Learned in Developing Policy Measurement Systems cont.

- Continued refinement of the systems often necessary
  - Avoid changing the system in the midst of coding— offers to many chances for error
- Systems are developed based on the best available data/evidence at the time.
- Systems will need to be enhanced over time to capture new topics, recommendations, evidence, etc.

**BTG plans for  
analysis and  
policy measurement**

# State policy measurement: Planned/possible future topics

- Planned topics
  - Farm to school program requirements
  - Restrictions on competitive food contracts/  
vending
- Possible future topics
  - Dedicated funding for school-based nutrition, PE  
and/or other obesity prevention programs
  - Menu labeling requirements
  - Zoning/land use policies, policies related to the  
built environment
  - New taxes (if enacted, e.g., “junk food taxes”)

# Local policy measurement: Planned/possible future topics

- Planned refinement of HER coding tool; addition of new sub-topics by BTG researchers
  - Farm-to-school, BMI measurement/reporting, contract requirements, vending machine bans, closed campus provisions, etc.
- County/municipal policy collection and measurement
  - Zoning/school siting policies

# Planned analyses... a few examples

- Relationships between:
  - state sales taxes for soft drinks and snacks and consumption patterns, weight outcomes
  - state sales taxes for restaurants and consumption patterns, weight outcomes
  - state/local policy requirements governing nutrition and physical activity and reported school practices, student behavior, weight outcomes
  - state safe routes policies and biking/walking to school among students

# Recommendations

# Developing Policy Measures

- Invest in comprehensive efforts to systematically identify, measure and analyze policies
  - Build on work of NCI and BTG
  - At all levels – national, state, local
- Ensure coordination among policy measurement systems
  - Learn from problems with tobacco control policy tracking efforts
  - Maximize consistency across policy tracking systems
  - Maximize sharing of data for use in evaluation

# Developing Policy Measures

- Refine and build indices that assess strength and comprehensiveness of policies
  - Important for use in policy evaluation studies
  - Useful for evaluating synergies among policies
- Assess policy implementation and enforcement
  - Critical to understanding ultimate impact of policies on behaviors/outcomes of interest

# Using Policy Measures

- Support research to evaluate the impact of policies and their implementation on key outcomes
  - Numerous research designs
    - interrupted time-series analyses
    - analyses using repeat cross-sectional data
    - Analyses using longitudinal data
  - Analyses that look at proximal and distal outcomes
    - Attitudes and knowledge
    - Physical activity
    - Healthy eating
    - BMI and indicators for overweight/obese

# Communicating Findings from Policy Evaluation

- Support dissemination of policy research findings to policy makers and other relevant audiences
  - Research on tobacco control policy nice example of partnerships between research, advocacy, and action-oriented efforts
- Develop mechanisms for feedback from policy makers to researchers
  - Helps define priorities for policy research
  - Identifies emerging policy issues that warrant research

impac**TEEN**



*A Policy Research Partnership  
for Healthier Youth Behavior*

YES!

Youth,  
Education,  
& Society

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

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