



**DRAFT STATEMENT**  
**June 14, 2006**  
**6:00 PM**

**NATIONAL INSTITUTES OF HEALTH**  
**STATE-OF-THE-SCIENCE CONFERENCE STATEMENT**  
Tobacco Use: Prevention, Cessation, and Control  
June 12–14, 2006

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*The statement reflects the panel's assessment of medical knowledge available at the time the statement was written. Thus, it provides a "snapshot in time" of the state of knowledge on the conference topic. When reading the statement, keep in mind that new knowledge is inevitably accumulating through medical research.*

**Introduction**

Tobacco use remains the Nation's leading preventable cause of premature death. Each year, more than 440,000 Americans die from disease caused by tobacco use, accounting for 1 in every 5 deaths. Cigarette smoking alone is responsible for more than 30 percent of cancer deaths annually in the United States, and smoking is also an important cause of death from heart disease, stroke, and chronic obstructive pulmonary disease. Currently, there are an estimated 44.5 million (21 percent) adult smokers and an estimated 3.75 million (22 percent) high school student smokers in the United States. Cigarettes are the predominant form of tobacco consumed; however, other forms of tobacco, such as smokeless tobacco (ST), cigars, and pipes, are also used. In addition to the toll in human lives, tobacco use places an enormous economic burden on society. From 1995 to 1999, estimated annual smoking-attributable economic costs in the United States were \$75.5 billion for direct medical care for adults and \$81.9 billion for lost productivity.

The medical and economic burdens of tobacco usage have made it the subject of intense research and public health efforts. In the last 50 years, tobacco use per capita has decreased from about 14 pounds per year in the 1950s to about 5 pounds per year in 2000, suggesting that interventions work. Yet, it is unlikely that the *Healthy People 2010* objectives of reducing smoking prevalence to 12 percent or less in adults and 16 percent or less in youth will be reached on schedule. An important challenge facing the public health, medical, and political communities is how to achieve further progress in reducing tobacco usage.

For this reason, the National Cancer Institute and the National Institutes of Health's Office of Medical Applications of Research sponsored a State-of-the-Science Conference on Tobacco Use: Prevention, Cessation, and Control on June 12–14, 2006, in Bethesda, MD. The key questions to be addressed at the State-of-the-Science Conference were:

- What are the effective population- and community-based interventions to prevent tobacco use in adolescents and young adults, including among diverse populations?
- What are the effective strategies for increasing consumer demand for and use of proven, individually oriented cessation treatments, including among diverse populations?
- What are the effective strategies for increasing the implementation of proven, population-level, tobacco-use cessation strategies, particularly by health care systems and communities?
- What is the effect of smokeless tobacco product marketing and use on population harm from tobacco use?
- What is the effectiveness of prevention and of cessation interventions in populations with co-occurring morbidities and risk behaviors?
- What research is needed to make the most progress and greatest public health gains nationally and internationally?

At the conference, invited experts presented information pertinent to these questions, and a systematic literature review prepared under contract with the Agency for Healthcare Research and Quality (AHRQ) was summarized. The Evidence Report (<http://www.ahrq.gov/clinic/epcix.htm>) emphasized randomized controlled trials, systematic reviews, and other experimental or observational studies with more than 100 participants. Invited conference speakers provided additional information. During the conference, attendees provided both oral and written statements that they perceived relevant to the above questions. The panel weighed this evidence to address the key conference questions.

**1. What are the effective population- and community-based interventions to prevent tobacco use in adolescents and young adults, including among diverse populations?**

It is always better to never start using tobacco than to have to stop. Tobacco use initiation occurs primarily during adolescence. Almost 25 percent of 12th graders have smoked in the prior 30 days, and almost all adult daily smokers have tried cigarettes before age 18. Research reports suggest a flattening of the downward trend in adolescent smoking observed over the past decade. Adolescents (13–18 years) and young adults (18–24 years) are susceptible to cultural influences, including family, friends, peers, media, community, and tobacco marketing influence. Because of these diverse influences, multiple approaches are needed to address tobacco use prevention. Diversity includes gender, racial/ethnic background, socioeconomic status, geography, and sexual orientation.

### ***What We Know***

Previous reviews have concluded that there are three effective general population approaches to prevention of tobacco use in adolescents and young adults: (1) increasing the price through taxes of tobacco products; (2) laws and regulations that affect youth access to tobacco products, exposure to smoke from tobacco, and restrictions on tobacco industry advertising; and (3) mass media campaigns. Previous reviews show that school-based intervention programs aimed at preventing tobacco use in adolescents are effective in the short term. Comprehensive statewide programs have also been shown to reduce overall tobacco use in young adults.

### ***What We Need To Learn***

Although previous evidence shows the impact of clean indoor air and youth access policies on adolescent smoking rates, we do not know much about the effectiveness of these policies in specific populations.

There is limited evidence about whether tailoring programs to adolescents and young adults with attention to culture improves outcomes. We do not know which strategies would lead to sustained effects on tobacco use prevention in school-based programs.

## **2. What are the effective strategies for increasing consumer demand for and use of proven, individually oriented cessation treatments, including among diverse populations?**

About 70 percent of the Nation's 44.5 million adult smokers want to quit, but fewer than 5 percent succeed in a given year. Effective treatments are available and can double or triple quit rates but not enough smokers request and use these interventions.

### ***What We Know***

Prior systematic reviews, such as the one by the Task Force on Community Preventive Services, identified effective strategies for increasing consumer demand for and use of proven individually oriented cessation treatments:

1. A mass media education campaign is an intervention of an extended duration that uses brief, recurring messages to inform and to motivate tobacco product users to quit. It is effective in increasing tobacco-use cessation when combined with other interventions. For example, it increases the use of telephone tobacco-cessation information or support services when the messages direct viewers to call for further information or support.
2. Proactive telephone smoking-cessation support occurs when the provider initiates contact with the smoker. It is effective especially when implemented with other interventions, such as educational approaches or clinical therapies in a variety of settings.

3. Increasing the unit price for tobacco products is effective in increasing tobacco use cessation and in reducing consumption. This has been demonstrated to be effective for Whites, Blacks, and Hispanics; for both genders; and for people across a broad range of socioeconomic status.
4. Reducing out-of-pocket costs for effective cessation therapies increases use of the effective therapy when its benefit is apparent to consumers. For example, insurance-based coverage of a smoking-cessation program increases use of cessation efforts.
5. Culturally tailored, gender-specific, and language-appropriate programs show promise.

### ***What We Need To Learn***

We need to understand how to tailor interventions for different populations because generic treatments may not be appropriate for everyone. To increase demand for treatments, smokers must be motivated to want them, expect them, and ask for them. We need to learn how to make treatments more attractive to tobacco users. We need to know how to sustain effective strategies to increase demand for effective treatments.

### **3. What are the effective strategies for increasing the implementation of proven, population-level, tobacco-use cessation strategies, particularly by health care systems and communities?**

Despite strong evidence that a variety of pharmacologic and behavioral interventions are effective for tobacco cessation, only a small proportion of tobacco users receive them. Identification of effective strategies for increasing use of effective tobacco-cessation interventions is essential for reducing tobacco use among Americans. While some strategies to promote cessation target individual tobacco users, others that take advantage of the fact that individuals exist within larger communities and systems may be efficient ways to increase use of cessation interventions. Community-level strategies are those aimed at broad geographic populations (e.g., cities) or smaller, more localized groups of people (e.g., military bases, colleges). Health care system-level strategies are those applied within clinical settings that range in scope from individual practices to large integrated organizations.

### ***What We Know***

Community-based interventions target tobacco users and aim to motivate demand for cessation interventions (media campaigns, pricing, smoke-free environments) or facilitate access to cessation services (community-level quit lines, accessibility to cessation services in community settings). Evidence suggests that media campaigns, public telephone-counseling programs (quit lines), and increases in tobacco pricing/taxation are effective. The provision of cessation services in the community was effective in one, good quality, published randomized controlled trial in pharmacies in the United Kingdom. Community-based self-help materials alone were ineffective when studied in controlled trials.

Several health care system strategies have fair to good evidence documenting their effectiveness in increasing implementation of smoking-cessation interventions. These approaches can target patients, providers, or both within clinical settings. Strong evidence supports the effectiveness of financial incentives, including reduction in out-of-pocket costs for cessation interventions and reimbursement of providers for cessation services. Other economic strategies, such as discounts on insurance premiums for nonsmokers, are untested. Effective educational and organizational approaches include routine systems for smoker identification, provider education, academic detailing, reminders, audit, and feedback. However, these approaches appear most effective when used in combination. Provider education or feedback have been shown to be ineffective when used in isolation. Published studies have used physician and nonphysician providers (nurses, dentists, orthodontists, social workers, psychologists, pharmacists, etc.) to effectively deliver cessation services. There is good evidence that health systems with dedicated staff for tobacco cessation services achieve better outcomes than those that do not designate specific staff for this function. Strategies that institutionalize cessation services in health settings, such as brief interventions for every primary care patient and mandatory counseling for tobacco users before hospital discharge, increase use of cessation services. Observational evidence suggests that measures of hospital (Joint Commission on Accreditation of Healthcare Organizations) or organization (Health Plan Employer Data and Information Set) quality related to tobacco cessation may increase their delivery.

### ***What We Need To Learn***

We need to understand better why effective strategies, such as smoke-free environments, pricing/taxes, media campaigns, and insurance coverage of cessation interventions, are not disseminated more widely and how to overcome these barriers.

Although some approaches are promising, considerable heterogeneity exists within each approach type. For example, telephone counseling programs vary in intensity, referral sources, and inclusion of pharmacotherapy. We need detailed information about the features that are critical to the success of particular strategies. Data are also lacking about the interaction of simultaneous efforts to increase tobacco cessation. What combination of health system strategies results in the best cessation outcomes? What is the interaction between community-based and health systems-based approaches?

It is unknown whether the positive experience of service delivery in pharmacies in the United Kingdom is generalizable to other nonclinical community settings in the United States.

Many studies have used multimodal, bundled services. Identification of the most and least effective components of these interventions might enable better delivery of these services.

Published studies have not systematically identified organizational features of health care systems that facilitate routine delivery of tobacco-cessation services. For example, we do not know how stepped-care approaches, and the availability of electronic health records might influence uptake of cessation services. To optimize health outcomes, we need to find ways to maximize efficiency by matching the intensity of the intervention to the needs of specific patients.

#### **4. What is the effect of smokeless tobacco product marketing and use on population harm from tobacco use?**

New products and aggressive marketing may increase the use of smokeless tobacco (ST) in the United States. Against this background, questions have been raised about overall population benefits and harms.

Use of any tobacco product must be discouraged. Yet some have argued that substituting ST for smoking may decrease overall population harm. Whether this is true depends on two questions: (1) Does ST marketing and use cause smokers to benefit by stopping smoking? and (2) Does ST marketing cause nonusers to start using tobacco products, which are addictive, harmful in their own right, and may lead to smoking?

A wide range of ST products are available, and new products are being developed and introduced. Conventional products widely available in the United States include chewing tobacco and snuff. These products contain variable levels of nicotine, carcinogens, and other toxins. Newer ST products may contain lower levels of nicotine and nitrosamines and have more appeal based on their delivery method or targeting to specific groups, such as young adults, athletes, and women.

Previous reviews describe the health risks of ST (including cancers of the oral cavity and pharynx, oral and periodontal disease, tooth decay, and pregnancy-related health problems). The range of risks, including nicotine addiction, from ST products may vary extensively because of differing levels of nicotine, carcinogens, and other toxins. It is unclear whether newer products with presumed lower levels of these substances carry substantially lower health risks.

#### ***What We Know***

The panel considered two questions: (1) Does marketing and use of ST cause smokers to switch to ST? (2) Does marketing of ST among never smokers cause them to take up ST and ultimately act as a gateway to smoking? The evidence report included no prior systematic reviews that addressed these questions. However, two fair-quality observational studies shed some light on these issues in the United States.

One cross-sectional study of young male adolescents reported that those who recalled ST advertisements were seven times more likely to use ST currently. Another cross-sectional population-based study of boys aged 11–19 reported that males who had been regular users of ST were more than three times as likely as never users of ST to become smokers at 4 years of followup. These studies do not support the hypothesis that ST results in harm reduction.

#### ***What We Need To Learn***

- The paucity of data in the United States about ST leaves many questions unanswered.
- Scandinavian studies do not provide adequate information about the range of ST products used in the United States or the diverse populations exposed to these products.

Data about the effectiveness of ST in facilitating smoking cessation and associated harm reduction are very limited. High-quality comparisons of ST to proven pharmacologic and behavioral cessation interventions are needed.

## **5. What is the effectiveness of prevention and of cessation interventions in populations with co-occurring morbidities and risk behaviors?**

Continued smoking among individuals who have psychiatric and physical diseases is associated with complications in the treatment of their disease, progression of disease, and adverse outcomes, including reduced survival in major smoking-related conditions. Individuals who have mood disorders, psychoses, anxiety disorders, developmental disorders, and substance use disorders suffer a disproportionate burden of nicotine addiction. For example, approximately 90 percent of individuals diagnosed with schizophrenia are smokers.

Additionally, individuals who have chronic diseases, such as asthma, diabetes, cardiovascular disease, cancer, and HIV/AIDS, have an increased adverse impact of smoking and exposure to environmental tobacco smoke (ETS). Although pregnancy is not an illness, there is increased adverse impact of tobacco use during pregnancy.

The benefit of smoking cessation in people who have these conditions is particularly high. HIV-infected smokers who quit are more likely to have good response to HIV treatment and are less likely to die compared to HIV-infected smokers. Benefits of smoking cessation after cancer diagnosis include decreased risk of treatment complications, decreased risk of second primary tumors, improved survival rates, and improved quality of life.

The evidence report narrowly defined risk behaviors as alcohol abuse and other chemical dependencies, but the panel considers substance abuse disorders as comorbid psychiatric conditions.

### ***What We Know***

Persons with *psychiatric conditions* can generally achieve smoking cessation, but not long-term abstinence, using standard pharmacological and behavioral interventions. However, counseling or cognitive behavioral therapy alone were not effective for adults with a history of major depressive disorder (MDD). Motivational interviewing or brief advice tobacco cessation were not effective for adolescents hospitalized for psychiatric and substance-use problems.

A meta-analysis showed that smoking cessation is effective in presence of substance abuse, and there is no evidence that it increases the relapse of other addictions. The findings support past recommendations that counseling and pharmacotherapy have positive short-term effects for such interventions, but given the number of studies, the body of evidence is insufficient to draw conclusions.

Individuals who have a history of MDD may have more difficulty quitting and more severe withdrawal symptoms than those who do not have MDD.

In persons who have *medical comorbidities*, such as cardiovascular disease and chronic obstructive pulmonary disease, successful treatments have significantly reduced smoking prevalence compared to controls. Reviews of randomized controlled trials conclude combination treatment (pharmacological and behavioral interventions) is superior to either intervention alone.

*Pregnancy:* In general, there is a high rate of attempts to quit and a low rate of success among pregnant women. However, smoking cessation is effective for highly motivated interested women who have a low level of nicotine addiction, and this improves pregnancy outcome. Unfortunately, the evidence documents high rates of relapse at 6–12 months postpartum.

### ***What We Need To Learn***

We do not know whether tailoring smoking-cessation interventions for people with psychiatric comorbidities will reduce the exacerbation of symptoms typically seen with current pharmacological smoking-cessation interventions.

No information was presented to the panel addressing prevention interventions in individuals who have comorbid conditions.

Because general randomized controlled trials of smoking cessation have not examined results in subgroups of individuals who have comorbid conditions, we lack information about the relative effectiveness of tobacco-cessation interventions in these subgroups.

We lack information about the appropriate timing of initiation of tobacco-cessation interventions in relationship to treatment of the comorbid conditions.

We need more information to address the benefits and risks of long-term nicotine replacement in patients who have psychiatric disorders. Further research is also needed to address the effectiveness of extended counseling for tobacco cessation in pregnancy and the potential impact of pharmacotherapy on fetal development.

We lack information about whether tailoring will increase the effectiveness of tobacco-use-cessation interventions in patients with comorbid disease.

We have intriguing but limited information about genetic predisposition to tobacco use and benefit from treatment.

## **6. What research is needed to make the most progress and greatest public health gains nationally and internationally?**

### ***Improve and Implement Effective Interventions***

- Understand the role of different media (TV, print, Web, radio, etc.) in increasing consumer demand for and use of effective, individually oriented tobacco-cessation treatments for diverse populations.

- Identify and reduce barriers faced by providers, insurers, policymakers, and others to implement effective strategies to increase and sustain demand for smoking-cessation treatment.
- Examine the effectiveness of different components of telephone-based counseling (population quit lines vs. provider-associated programs, self-referral vs. provider referral to telephone-based counseling, bundling of services within programs).
- Develop and enhance pharmacological and nonpharmacological treatments.

### ***Improve and Implement Effective Policies***

- Increase policymakers' and the public's awareness of effective strategies for preventing tobacco use, promoting smoking cessation, and decreasing harm from environmental tobacco exposure.
- Identify and overcome barriers to implementation of successful comprehensive statewide tobacco-control programs, like those used in California and Florida.
- Develop effective provider-reimbursement policies for tobacco control.

### ***Develop New Population- and Community-Based Interventions***

- Improve school-based interventions to achieve sustained tobacco prevention. Potential improvements might include targeting programs to diverse populations, starting programs in elementary schools, and learning the role of afterschool programs.
- Determine the effectiveness of implementing interventions in settings other than schools and health care facilities, such as homes, community organizations, faith-based institutions, pharmacies, stores, bars, workplaces, military institutions, and correctional institutions.
- Determine the effectiveness of incorporating social context (e.g., culture, neighborhoods, and social networks) in interventions to prevent or stop tobacco use.
- Evaluate the long-term effects of social marketing strategies on tobacco use, particularly to counter tobacco advertising.
- Evaluate approaches to reduce tobacco use in populations that are particularly vulnerable or where tobacco has a disproportionately adverse effect, including: people who have co-occurring conditions; racial and ethnic minorities; people who have low socioeconomic status; people who have limited English proficiency; people who have low levels of health literacy; and lesbian, gay, bisexual, and transgender populations.

- Take advantage of “natural experiments” that result from implementation of new policies to evaluate the associations between pricing/taxation, smoke-free environments or restrictions on the availability of tobacco products, and demand for cessation services.
- Evaluate the effectiveness of chronic care models for increasing smoking cessation.
- Evaluate the effectiveness of public performance measures and financial incentives for increasing smoking cessation.

### ***Infrastructure***

- Promote surveillance programs that track tobacco use (initiation, quitting, intensity of smoking, use of ST), treatment use and motivation, products and marketing, policy and systems changes.
- Standardize definitions and methods to describe tobacco-use status, interventions, processes, and outcomes so that studies may be compared more readily. Encourage cost and economic studies.
- Educate providers, including physicians, dentists, nurses, and allied health professionals about the importance of tobacco-related diseases and the availability and delivery of effective interventions.

### ***Smokeless Tobacco***

- Conduct research on the impact of ST marketing on tobacco use and health effects in smokers and nonsmokers, particularly in vulnerable populations.
- Measure the levels and variability of nicotine and other toxins in various ST products to better understand potential health risks.
- Evaluate advantages and disadvantages of regulating ST in a manner similar to cigarettes, and medicinal nicotine.
- Assess the risks of cancer and other diseases in relation to ST.

### **Conclusions**

We highlight the following findings and recommendations:

- Tobacco use remains a very serious public health problem. Coordinated national strategies for tobacco prevention, cessation, and control are essential if the United States is to achieve *Healthy People 2010* goals.

- Most adult smokers want to quit, and effective interventions exist. However, only a small proportion of tobacco users receive intervention. This gap represents a major national quality-of-care problem.
- Many cities and States have implemented effective policies to reduce tobacco use; these models should be evaluated for widespread adoption.
- Because ST use may increase in the United States, it will be increasingly important to understand net population harms.
- Prevention, especially among youth, and cessation continue to be essential strategies to reduce tobacco use.
- Tobacco use is a critical and chronic problem that requires continuous and comprehensive attention from providers, health care organizations, and research support organizations.

## **State-of-the-Science Panel**

### **David F. Ransohoff, M.D.**

Panel and Conference Chairperson  
Professor of Medicine  
School of Medicine  
University of North Carolina at Chapel Hill  
Chapel Hill, North Carolina

### **Marshall H. Chin, M.D., M.P.H.**

Panel and Conference Co-chairperson  
Associate Professor of Medicine  
University of Chicago  
Chicago, Illinois

### **Frederic C. Blow, Ph.D.**

Director  
Serious Mental Illness Treatment Research  
and Evaluation Center  
Ann Arbor Veterans Administration  
Medical Center  
Associate Professor  
Department of Psychiatry  
University of Michigan Medical School  
Ann Arbor, Michigan

### **Bernadine Cimprich, Ph.D., R.N., F.A.A.N.**

Associate Professor, Nursing  
University of Michigan  
Ann Arbor, Michigan

### **Lawrence Friedman, M.D.**

Independent Consultant  
Rockville, Maryland

### **Christine Laine, M.D., M.P.H.**

Senior Deputy Editor  
Annals of Internal Medicine  
Clinical Associate Professor  
Jefferson Medical College  
Philadelphia, Pennsylvania

### **William F. Renn, M.S.W., L.C.S.W., L.C.A.S., C.C.S.**

Associate Professor  
Department of Psychiatry  
University of North Carolina School  
of Medicine  
Director  
University of North Carolina Health Care's  
Alcohol and Substance Abuse Program  
Chapel Hill, North Carolina

### **Elena V. Rios, M.D., M.S.**

President and CEO  
National Hispanic Medical Association  
Washington, DC

### **Mary E. Ropka, Ph.D., R.N., F.A.A.N.**

Associate Member  
Division of Population Science  
Fox Chase Cancer Center  
Philadelphia, Pennsylvania

### **Anita L. Sabichi, M.D.**

Associate Professor  
Department of Clinical Cancer Prevention  
University of Texas M.D. Anderson  
Cancer Center  
Houston, Texas

### **Marilou G. Tablang-Jimenez, M.D.**

General and Child Adolescent Psychiatry  
Germantown, Maryland

### **Stephen B. Thomas, Ph.D.**

Director  
Center for Minority Health  
Philip Hallen Professor of Community  
Health and Social Justice  
Graduate School of Public Health  
University of Pittsburgh  
Pittsburgh, Pennsylvania

### **Nancy S. Thomason**

Founder and President  
Oklahoma Brain Tumor Foundation  
Oklahoma City, Oklahoma

### **Claudette Varricchio, D.S.N., R.N., F.A.A.N.**

Independent Consultant  
Rockville, Maryland

## **Speakers**

**Lourdes Baezconde-Garbanati, Ph.D., M.P.H.**

Director, Hispanic/Latino Tobacco Education Partnership and Southern California Cancer Information Services Partnership Program Office (CIS)  
Institute for Health Promotion and Disease Prevention Research and Norris Comprehensive Cancer Center  
Department of Preventive Medicine  
Keck School of Medicine  
University of Southern California  
Alhambra, California

**Elizabeth M. Barbeau, Sc.D., M.P.H.**

Associate Professor  
Dana Farber Cancer Institute  
Harvard School of Public Health  
Boston, Massachusetts

**Michael C. Fiore, M.D., M.P.H.**

Professor of Medicine  
Director, UW-Center for Tobacco Research and Intervention  
University of Wisconsin  
Madison, Wisconsin

**Jean Forster, Ph.D., M.P.H.**

Professor  
Division of Epidemiology and Community Health  
University of Minnesota  
Minneapolis, Minnesota

**Phillip Gardiner, Ph.D.**

Social and Behavioral Sciences  
Research Administrator  
University of California  
Oakland, California

**Gary A. Giovino, Ph.D., M.S.**

Senior Research Scientist  
Director, Tobacco Control Research Program  
Division of Cancer Prevention and Population Sciences  
Department of Health Behavior  
Roswell Park Cancer Institute  
Buffalo, New York

**Ellen R. Gritz, Ph.D.**

Olla S. Stribling Distinguished Chair for Cancer Research  
Professor and Chair, Department of Behavioral Science  
University of Texas M.D. Anderson Cancer Center  
Houston, Texas

**Sharon M. Hall, Ph.D.**

Professor in Residence, Psychiatry  
University of California, San Francisco  
San Francisco, California

**Dorothy Hatsukami, Ph.D.**

Professor  
University of Minnesota  
Minneapolis, Minnesota

**Lynn T. Kozlowski, Ph.D.**

Professor and Head  
Department of Biobehavioral Health  
Pennsylvania State University  
University Park, Pennsylvania

**Tim McAfee, M.D., M.P.H.**

Chief Medical Officer  
Free & Clear  
Seattle, Washington

**Cathy L. Melvin, Ph.D., M.P.H.**  
Senior Research Fellow and Director  
Child Health Services Research  
Cecil G. Sheps Center for Health  
Services Research  
Research Associate Professor  
Department of Maternal and Child Health  
School of Public Health  
University of North Carolina at Chapel Hill  
Chapel Hill, North Carolina

**C. Tracy Orleans, Ph.D.**  
Distinguished Fellow and Senior Scientist  
Robert Wood Johnson Foundation  
Princeton, New Jersey

**Eliseo Perez-Stable, M.D.**  
Professor of Medicine  
University of California, San Francisco  
San Francisco, California

**John P. Pierce, Ph.D.**  
Sam M. Walton Professor for Cancer  
Research  
University of California, San Diego  
La Jolla, California

### **Planning Committee**

**Scott J. Leischow, Ph.D.**  
Planning Committee Chairperson  
U.S. Department of Health and Human  
Services  
Washington, DC  
and  
Branch Chief  
Tobacco Control Research Branch  
National Cancer Institute  
National Institutes of Health  
Rockville, Maryland

**David Ashley, Ph.D.**  
Senior Scientist Officer  
Centers for Disease Control and Prevention  
Atlanta, Georgia

**Leah M. Ranney, Ph.D., M.A.**  
Research Fellow and Research Associate  
Cecil G. Sheps Center for Health Services  
Research  
University of North Carolina at Chapel Hill  
Chapel Hill, North Carolina

**Robert A. Schnoll, Ph.D.**  
Assistant Professor  
Transdisciplinary Tobacco Use Research  
Center  
Department of Psychiatry  
University of Pennsylvania  
Philadelphia, Pennsylvania

**Scott L. Tomar, D.M.D., Dr.P.H.**  
Associate Professor and Chair  
Department of Community Dentistry and  
Behavioral Science  
University of Florida, College of Dentistry  
Gainesville, Florida

**David Atkins, M.D., M.P.H.**  
Chief Medical Officer  
Center for Practice and Technology  
Assessment  
Agency for Healthcare Research and Quality  
Rockville, Maryland

**Cathy L. Backinger, Ph.D., M.P.H.\***  
Tobacco Control Research Branch  
Behavioral Research Program  
Division of Cancer Control and Population  
Sciences  
National Cancer Institute  
National Institutes of Health  
Bethesda, Maryland

---

\* Institute Coordinator as of 5/05

**Rosalind A. Breslow, Ph.D., M.P.H.**  
Epidemiologist  
Division of Biometry and Epidemiology  
Division of Epidemiology and Prevention  
Research  
National Institute on Alcohol Abuse and  
Alcoholism  
National Institutes of Health  
Bethesda, Maryland

**Patricia S. Bryant, Ph.D.**  
Health Scientist Administrator  
Behavioral and Social Science Research  
Program  
Clinical Research Branch, Division of  
Clinical Research and Health Promotion  
National Institute of Dental and  
Craniofacial Research  
National Institutes of Health  
Bethesda, Maryland

**Allison Chausmer, Ph.D.**  
Translational Research Branch  
National Institute on Drug Abuse  
National Institutes of Health  
Bethesda, Maryland

**Monique Ernst, M.D., Ph.D.**  
Section of Developmental and Affective  
Neuroscience  
National Institute of Mental Health  
National Institutes of Health  
Bethesda, Maryland

**Kenneth Fink, M.D., M.G.A., M.P.H.**  
Director  
Evidence-based Practice Centers Program  
Center for Outcomes and Evidence  
Agency for Healthcare Research and Quality  
Rockville, Maryland

**Gary A. Giovino, Ph.D., M.S.**  
Senior Research Scientist  
Director, Tobacco Control Research Program  
Division of Cancer Prevention and  
Population Sciences  
Department of Health Behavior  
Roswell Park Cancer Institute  
Buffalo, New York

**Martha L. Hare, Ph.D., R.N.**  
Program Director  
National Institute of Nursing Research  
National Institutes of Health  
Bethesda, Maryland

**Lynne M. Haverkos, M.D., M.P.H.**  
Medical Officer  
National Institute of Child Health and  
Human Development  
National Institutes of Health  
Bethesda, Maryland

**Jack E. Henningfield, Ph.D.**  
Professor of Behavioral Biology  
Department of Psychiatry and  
Behavioral Sciences  
Vice President, Research and Health Policy  
Pinney Associates  
Bethesda, Maryland

**Jared B. Jobe, Ph.D.**  
Health Scientist Administrator  
National Heart, Lung, and Blood Institute  
National Institutes of Health  
Bethesda, Maryland

**Gary King, Ph.D.**  
Associate Professor  
Biobehavioral Health  
Pennsylvania State University  
University Park, Pennsylvania

**Barnett S. Kramer, M.D., M.P.H.**  
Director  
Office of Medical Applications of Research  
Office of the Director  
National Institutes of Health  
Bethesda, Maryland

**Kelli K. Marciel, M.A.**  
Communications Director  
Office of Medical Applications of Research  
Office of the Director  
National Institutes of Health  
Bethesda, Maryland

**Colleen M. McBride, Ph.D.**  
Chief, Social & Behavioral Research Branch  
National Human Genome Research Institute  
National Institutes of Health  
Bethesda, Maryland

**Ernestine Murray, R.N., M.A.S.**  
Captain  
U.S. Public Health Service  
Senior Health Policy Analyst  
Senior Advisor on Tobacco Use  
Center for Outcomes and Evidence  
Agency for Healthcare Research and Quality  
Rockville, Maryland

**C. Tracy Orleans, Ph.D.**  
Distinguished Fellow and Senior Scientist  
Robert Wood Johnson Foundation  
Princeton, New Jersey

**Terry F. Pechacek, Ph.D.**  
Associate Director for Science  
Office on Smoking and Health  
Centers for Disease Control and Prevention  
Atlanta, Georgia

**Aron Primack, M.D.**  
John E. Fogarty International Center  
National Institutes of Health  
Bethesda, Maryland

**Cynthia A. Rooney**  
Senior Advisor for Consensus Development  
Office of Medical Applications of Research  
Office of the Director  
National Institutes of Health  
Bethesda, Maryland

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National Center for Health Statistics  
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Hyattsville, Maryland

**Ed Trapido, Sc.D.**  
Associate Director  
Epidemiology and Genetics Program  
National Cancer Institute  
National Institutes of Health  
Bethesda, Maryland

**Tatiana M. Foroud, Ph.D.<sup>†</sup>**  
Associate Professor  
Director, Hereditary Genomics Division  
Department of Medical and Molecular  
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