Executive Summary

Many Americans say they fear cancer more than any other disease. In each of the past two years, small but encouraging decreases in cancer deaths have been recorded. But cancer still claims more than a half million lives each year in the United States, and nearly 1.5 million new cases are diagnosed annually. Tragically, two-thirds of these deaths – and many thousands of new cases – could be avoided. Tobacco use and environmental tobacco smoke (ETS) exposure account for nearly a third of all cancer deaths in America, and unhealthy diets are believed to account for another third.

The President's Cancer Panel has noted with growing concern the accelerating increase in obesity among adults and children, the mounting evidence linking obesity to higher risk for numerous cancers, and the lack of recent progress in reducing tobacco use. Between September 2006 and February 2007, the Panel convened four meetings to examine the current evidence regarding the effects of diet, nutrition, physical activity, tobacco use, and tobacco smoke exposure on cancer risk as well as ongoing and potential actions to reduce the national cancer burden by promoting healthy lifestyles.

Lifestyle and Cancer Risk – Current Approaches to Cancer Prevention

Few would disagree that the cancer and other disease-related morbidity, mortality, health care costs, and productivity losses associated with unhealthy lifestyle behaviors are escalating at an alarming rate. Studies indicate, however, that many people believe they have little ability to affect their cancer risk, despite clear evidence that healthy lifestyle behaviors can reduce the chance of developing the disease.

Research Emphases in Cancer Prevention and Control

Interest in cancer prevention and control research appears to be increasing as the toll of cancer and related health care costs grow, but funding still is quite limited compared with support for cancer detection and treatment research. Little cancer prevention and control research is behavioral or policy-oriented, although greater knowledge in both areas is essential to inform and improve primary and secondary prevention efforts.

…achieving social change…will require unprecedented will and commitment.

— James Levine, M.D., Ph.D.
Mayo Clinic College of Medicine

Most of the federally-sponsored cancer prevention research underway or planned emphasizes exploring genetic and/or molecular biologic indicators or predictors (markers) of cancer, metabolic pathways, and possible interventions (e.g., preventive agents) to interrupt the multi-step cancer development process before invasive disease occurs. Although this work is important and should continue to be supported, it ignores the macroenvironment

and the physical, social, and cultural contexts within which food choices, opportunities for physical activity, and tobacco use and smoke exposure occur. Moreover, population-level benefits from this research are decades away. In the more immediate term, the principal causes of lung and numerous other cancers are amenable to change through behavioral and policy/environmental interventions, which offer the best chance of substantially reducing the cancer burden.

Sick Care, Not Well Care

Our health care system continues to be strongly oriented to the provision of acute care. Most physicians are trained principally to treat disease, not to help people remain well. In addition, the amount of time physicians usually spend with each patient is extremely limited due to productivity pressures (i.e., to see a given number of patients each day), causing office visits to focus primarily, if not entirely, on the presenting complaint.

As the Panel has noted in previous reports, procedures to address episodes of acute illness or treat chronic conditions are covered by health insurance, but reimbursement is scarce or nonexistent for services (excluding cancer screening for early detection) to maintain wellness or prevent disease, such as counseling, education, outreach, and behavioral or psychosocial interventions. Medicare reimbursement levels for medical services reflect a continuing lack of emphasis on disease prevention in the current health care system, and most private health plan reimbursement policies and schedules quickly mirror Medicare payment rates. Medicare reimbursement policies also influence state Medicaid payment rates. In the private sector, a major barrier to coverage for behavioral or other cancer risk-reducing interventions has been the short-term profit mentality of publicly-held private insurers and many corporations. Employee turnover and resultant changes in health plan participation have made both insurers and employers hesitant to invest in preventive interventions because of doubts that they would be the ones to enjoy whatever health care cost savings might accrue.

Wellness Initiatives – Bridging the Gap, Promoting a Culture of Wellness

In growing numbers, however, larger employers and some state and local governments are attempting to counter rising health care costs, productivity losses, and the health care system's lack of emphasis on disease prevention by devising and implementing wellness programs. Regardless of their motivation, these programs are promoting a culture of wellness and individual empowerment regarding personal health that has not previously existed in many segments of the population. In addition, numerous publicly-sponsored and other health promotion-oriented Web sites now offer tools to help people adopt healthier lifestyles.

This is a promising trend, but many millions of Americans will continue to lack access to wellness services such as these, perhaps for many years. Promoting a culture of wellness may be most challenging among people in part-time and low paying jobs and the unemployed who lack employer health or Medicaid benefits, those without a usual source of care, individuals without computer access, those less educated and/or health literate, those living in neighborhoods in which it is unsafe to exercise outdoors and where fresh food access is limited, and individuals whose first language is not English. A number of local governments and community organizations, in some cases with Federal financial assistance, are attempting to reach these populations with culturally tailored fitness, nutrition, and other interventions.

Reducing Cancer Risk Through Diet, Nutrition, and Physical Activity

The term, "energy balance," as applied to human health, typically refers to the integrated effects of diet, physical activity, and genetics on growth and body weight over an individual's lifetime. Increasingly, scientists are becoming aware of the importance of understanding the effects of energy balance on cancer development and progression and on cancer survivors' quality of life post-treatment. Weight, body composition, physical activity, and diet affect numerous physiologic systems and therefore can alter the cancer process at many points.

Obesity, Diet, Nutrition, and Cancer

Almost two-thirds of the U.S. adult population is overweight, and approximately half of those individuals are obese. It has been estimated that if current trends persist, 74 percent of the adult population will be overweight or obese by 2010 and by 2016, more than half of the population is likely to be obese. As an overall public health problem, obesity due to unhealthy lifestyle may be challenging tobacco use in its population impact – certainly with respect to associated morbidity – and has led some to believe that it could result in shortened life expectancy in the relatively near future. Estimates of obesity-related mortality vary, but a 2005 Centers for Disease Control and Prevention (CDC) study estimated that approximately 112,000 deaths are associated with obesity annually in the United States, making obesity the second leading contributor (after tobacco use) to premature death.

We all must come to grips with the reality that our society has dramatically altered the way we live, eat, work, and play.

— Dwayne Proctor, Ph.D., M.A. Robert Wood Johnson Foundation

Obesity rates vary considerably among population groups, with higher rates observed among the poor and some ethnic/minority groups. The escalating rates of overweight and obesity among children and adolescents are of great concern since these individuals have as much as an 80 percent risk of becoming overweight adults.

The list of cancers associated with obesity continues to grow; established or suspected obesity-related cancers include:

- Breast (postmenopausal)
- Prostate (advanced)
- Pancreas
- Esophagus (adenocarcinoma)
- Gastric Cardia (adenocarcinoma)
- Endometrium
- Colon and Rectum
- Liver
- Gallbladder
- Kidney (renal cell)
- Non-Hodgkin's Lymphoma
- Multiple Myeloma
- Leukemia
- Stomach (men)
- Ovary
- Uterus
- Cervix

Some of these correlations between obesity and cancer risk, incidence, and prognosis are better established than others. Studies have found overall cancer death rates as much as 50 percent higher in obese men compared with their normal weight counterparts, and more than 60 percent higher cancer death rates among obese women.

Efforts to halt and reverse current obesity trends are unlikely to succeed without the participation and collaboration of governments, non-governmental organizations, industry, educators, and individuals. For example, current agricultural and public health policy is not coordinated – we heavily subsidize the growth of foods (e.g., corn, soy) that in their processed forms (e.g., high fructose corn syrup, hydrogenated corn and soybean oils, grain-fed cattle) are known contributors to obesity and associated chronic diseases, including cancer.

The upcoming reauthorization of the Farm Security and Rural Investment Act of 2002 (the Farm Bill) provides an opportunity that must not be missed to strongly increase support for fruit and vegetable farmers, improve the national food supply, and enhance the health of participants in the national school lunch, food stamp, and Women, Infant, and Children food assistance programs. Greater efforts are needed to improve the nutrition environment, particularly in lower income areas, to ensure that all people have physical and financial access to healthy food. Although some school districts are attempting to improve the school nutrition environment, the quality of most school food service offerings is poor due to the use of processed government surplus foods and the availability of unhealthy foods in school vending machines, cafeterias, and school stores.

Food marketing, particularly to children, emphasizes unhealthy food products. Currently, such marketing is regulated only by voluntary guidelines established by the food and beverage industries. In addition to more effective oversight of food advertising, coordinated public education is needed to teach children and adults about healthy eating to avoid cancer, heart disease, hypertension, and diabetes. Constructive involvement of the media will be essential to reach these objectives.

…there's a balance that has to be struck when we begin to have these conversations about our food system. It can't just be a corporate focus. It has to be a focus that has a social justice emphasis.

— LaDonna Redmond
Institute for Community Resource Development

The links between cancer, diet, and obesity have not been accepted sufficiently by the health insurance industry to motivate widespread coverage for health-promoting/cancer prevention services such as nutrition counseling or obesity-related treatment services. Obesity itself typically is not a covered medical condition. An individual must develop an established obesity-related condition (e.g., diabetes, hypertension, heart disease, high cholesterol) to receive reimbursed treatment. However, the treatment generally only covers services to control the obesity-related disease, but not to address its underlying cause. This situation reflects the overall acute care orientation of the health system; for example, the services of a nutritionist or dietitian seldom are reimbursed outside of a specialized cardiac rehabilitation or diabetes management program. Health care providers have a crucial role in helping patients understand the meaning of energy balance and body mass index (BMI), the necessity of reducing caloric intake in order to lose weight, and the increased risk for many cancers due to obesity.

Employers can help employees control their weight and reduce health care costs related to cancer and other chronic diseases by offering healthier choices at worksite food service facilities and vending machines, manipulating prices to make healthier options more appealing than unhealthy ones, and actively encouraging employee fitness.

Thus, multi-pronged nutritional interventions have the potential to increase individual awareness of the relationship between diet and cancer, and also reach the family, community, and society as a whole. Barriers to healthy eating must be removed and greater resources should be provided for vulnerable populations. In addition, support is needed for people who are making healthy changes, and population-level nutrition policies are required.

Physical Activity and Cancer

The importance of physical activity in cancer prevention, independent of diet and obesity, is becoming better understood. According to 2005 Behavioral Risk Factor Surveillance Survey (BRFSS) data, a quarter of all adults engage in no leisure time physical activity. Less than half engage in moderate or vigorous physical activity as recommended by CDC. By age 18 to 22 years, only 26 percent of males and 12 percent of females engage in moderate or strenuous activity at least five times per week. Inactivity during childhood and adolescence is of particular concern because it increases the likelihood of being inactive as an adult, and less active adults are at greater risk of developing colon cancer, heart disease, and high blood pressure.

Cancers with an established or suspected association with physical inactivity include:

- Colon
- Rectum
- Endometrium
- Breast
- Kidney
- Ovary
- Prostate
- Lung
- Testis

Though findings to date vary by cancer site and population studied, inactivity generally is associated with higher cancer risk and protective effects of exercise increase with frequency, intensity, and duration of activity. Though most research to date has focused on the efficacy of physical activity in cancer prevention, accumulating evidence also demonstrates that exercise influences other aspects of the cancer experience, including cancer detection, coping ability, rehabilitation, and survival.

As with obesity, diet, and nutrition, numerous initiatives and Web sites have been established by Federal and non-governmental organizations to encourage people to become more active. Those that have been evaluated have shown variable success and may be most effective as part of a multi-pronged physical activity intervention. Numerous states and localities are launching programs and environmental improvements to increase physical activity among residents, usually as part of broader wellness initiatives.

The built environment is a key influence on the likelihood that people will adopt and maintain an active lifestyle. Research on adults has found a direct relationship between the convenience of places to walk and the proportion of adults meeting current activity recommendations. In many neighborhoods, lack of sidewalks, inadequate lighting, and other safety concerns are significant disincentives to outdoor physical activity. Many neighborhoods lack playgrounds and other recreational facilities; in others, available facilities need substantial refurbishment to be both safe and attractive. Moreover, as suburbs radiate further from city centers, residential communities are being placed far from employment centers and shopping hubs, necessitating auto travel to commute to jobs and accomplish shopping and other routine tasks.

The decline of physical education in schools unfortunately has coincided with unhealthy changes in family eating patterns (e.g., increase in percentage of restaurant meals eaten, eating "on-the-run"), increased sedentary leisure activities, and other changes in common behavior patterns.

...there has been very limited study of the benefits of physical activity for long-term cancer survivors, survivors of understudied cancer sites, and minority or medically underserved groups, and these need to be priorities for future funding.

— Kerri Winters-Stone, Ph.D. Oregon Health & Science University

For example, few children still walk to school. Diminished participation in physical education is one of several factors contributing to increasing obesity rates among children and teens. Physical education has been all but eliminated in many schools, largely due to pressures to improve performance in core academic subjects. In schools that offer physical education, classes usually are large, limiting the amount of time each child can participate actively. Only a handful of states measure children's body mass index and report the results to parents. In addition, most schools still offer little more than traditional team sports; some are beginning to focus on individually-oriented activities that all students can enjoy throughout life, regardless of baseline skill levels.

Widely available and increasingly diverse forms of media entertainment are key contributors to sedentary lifestyles that are a major factor in climbing obesity rates. According to one estimate, children aged 8 to 18 years spend an average of 6.5 hours per day either in front of a screen (e.g., television, video console, non-homework related computer) or listening to music. Data on adult use of media entertainment are scarce, but some studies suggest substantial levels of use, particularly among adults who also report engaging in no physical activity. Moreover, the ability of media coverage to shape public opinion and reinforce various behaviors (e.g., perceptions of fitness and physical activity as normative and desirable behaviors) is extremely powerful. This influence should be used to promote healthy lifestyles that would help reduce the burden of cancer and other chronic diseases.

Though still not commonplace, some employers are trying to encourage recreational physical activity among employees. These efforts usually are part of a broader wellness program that may target obesity, diabetes and hypertension control, and other health issues. The motivation typically is to induce employees to improve their health in order to reduce health benefit costs and improve worker productivity.

As is true regarding diet and nutrition counseling, most primary care providers do not routinely counsel patients about the importance of physical activity and the level of activity needed to lose weight and maintain a healthy weight. Like nutrition counseling, physical activity counseling or services seldom are reimbursed by public or private health insurance plans except in the context of cardiac rehabilitation or physician-prescribed physical therapy.

Because physical activity is not a routine part of most Americans' lives, individuals and families will need to find and create opportunities to become more active. Individuals also can advocate for themselves and their families for changes to make neighborhoods more exercise-friendly for adults and children, and for meaningful physical education in schools.

Reducing Cancer Risk by Eliminating Tobacco Use and Exposure

Tobacco use is the number one cause of preventable death in the United States, and the second leading cause of death in the world. It is estimated that if current tobacco use trends continue, by 2020 approximately 10 million tobacco-related deaths will occur each year, with more than a billion tobacco-related deaths in the 21st century.

Tobacco Use and Cancer

The only known way to reduce tobacco-related death and disease is the prevention and cessation of tobacco use and environmental tobacco smoke (ETS) exposure. In effect, if the population ceased smoking, this single behavior change would be tantamount to a vaccine against one-third of cancer deaths. Half of all long-term smokers – particularly

those who began smoking as teens – will eventually die prematurely from a disease caused by tobacco; half of these people will die in middle age, losing on average 20 to 25 years of life expectancy.

Nicotine in tobacco causes addiction as powerful and self-reinforcing as addiction to drugs such as cocaine and heroin. Tobacco use has been established unequivocally as a causative or contributory agent in the development of a growing list of cancers:

- Lung
- Trachea
- Bronchus
- Esophagus
- Oral Cavity
- Lip
- Nasopharynx
- Nasal Cavity
- Larynx
- Paranasal Sinuses
- Stomach
- Bladder
- Kidney
- Pancreas
- Uterine Cervix
- Acute Myeloid Leukemia

Susceptibility to tobacco carcinogens and subsequent cancer development is believed to be affected by numerous factors, including but not limited to familial genetic predisposition, other genetic alterations, DNA repair capacity, differences in carcinogen metabolism, defects in cell signaling pathways, cell/environment interactions, and chronic inflammatory processes. Smoking also is a major cause of heart and cerebrovascular disease, chronic bronchitis, and emphysema.

In 2005, 20.9 percent of U.S. adults (18 years of age and older) were current cigarette smokers; smoking prevalence remains higher among men (23.9 percent) than among women (18.1 percent). Smoking prevalence is higher among the poor compared with those with more resources, varies considerably among racial/ethnic groups, and generally decreases with increasing educational level.

Several population groups are particularly vulnerable to tobacco initiation, continued use, and consequent disease. Perhaps the most important of these is youth; since the younger people are when they begin to smoke, the more likely they are to become addicted adult smokers. More than 80 percent of adult smokers become addicted as teenagers. Nicotine-addicted adolescents typically overestimate their ability to stop smoking when they choose, and most relapse after a quit attempt. Of particular concern, the decline in teen smoking rates that began in the late 1990s appears to have flattened, in part due to the introduction of numerous new tobacco products designed to appeal to young people (e.g., flavored cigarettes and cigars). Similarly, use of smokeless tobacco (ST) products by youth declined after the mid-1990s, but has begun to increase again, in part due to the introduction of many new youth-targeted flavored ST products. ST use is strongly associated with smoking initiation. Other populations of special concern with regard to smoking initiation and ongoing tobacco use include young adults, women, racial/ethnic minorities, the poor, active military personnel, veterans, cancer survivors, persons with mental illness, and the gay and lesbian communities.

More Americans will die in just the next three years from tobacco than have died in all previous wars combined. We would have to have the equivalent of five World Trade Centers destroyed or people killed to equal the number of deaths that we see in just one week in this country from tobacco.

— K. Michael Cummings, Ph.D., M.P.H.
Roswell Park Cancer Institute

As is true concerning efforts to address poor diet and nutrition, physical inactivity, obesity, and the added cancer risk attributable to these lifestyle factors, numerous stakeholders are involved in the current tobacco problem in the United States and worldwide – and its

solution. Evidence-based methods exist to reduce tobacco use initiation and facilitate cessation (e.g., tobacco tax increases, smoke-free environments, anti-smoking campaigns and education) and to treat tobacco users (pharmacologic and behavioral interventions). These tools must be applied more broadly and in concert at both individual and population levels to substantially reduce the burden of cancer due to tobacco use.

It is not an exaggeration to characterize the tobacco industry as a vector of disease and death that can no more be ignored in seeking solutions to the tobacco problem than mosquitoes can be ignored in seeking to eradicate malaria. Over the past half century, the industry has developed highly sophisticated strategies to oppose effective public policies and programs to reduce tobacco consumption, reaching into all levels of the political system and maintaining public denial in the face of overwhelming scientific evidence of addiction and harm from tobacco products. The tobacco companies also have manipulated product design and contents to increase their addictiveness and appeal.

Key actions needed at the Federal level to reduce the disease burden of the tobacco pandemic in the United States and globally include ratifying the Framework Convention for Tobacco Control, authorizing the Food and Drug Administration to regulate the content and marketing of all tobacco products, increasing the Federal tobacco excise tax, and excluding tobacco and tobacco products from all international trade agreements. In addition, the Federal commitment to tobacco control research does not reflect the burden of disease caused by tobacco and must be strengthened.

Despite having ample funds with which to administer effective tobacco control programs, only a handful of state governments have ever supported tobacco control efforts at the level recommended by CDC – a mere 7.3 percent on average of state tobacco tax revenues and annual payments under the 1998 Master Settlement Agreement (or similar state/industry settlements). Moreover, for reasons including industry and political pressures and competing priorities (e.g., highway construction, debt service), many previously robust programs have had most or all of their funding withdrawn. The tobacco companies have been quick to fill this void with vastly increased product promotion to targeted populations. States need to restore and/or increase funding for tobacco control and continue to raise excise taxes, which have been shown to discourage tobacco use, particularly by youth.

Important tobacco control investments and partnerships exist among numerous non-governmental organizations and with Federal agencies such as CDC and the National Cancer Institute. These should be continued and expanded.

Media portrayals of smoking as a pleasurable, attractive, and normal adult activity are enormously powerful influences on young people's attitudes about smoking and the likelihood that they will use tobacco. Therefore, the media have a significant moral responsibility to not promote the use of deadly tobacco products, and can have a far reaching influence in actively discouraging tobacco use.

Direct health care costs due to tobacco-related disease are now estimated at $75 billion annually, and indirect costs exceed $81 billion. Smokers have higher overall health care costs compared with nonsmokers, and family members of people who smoke often have higher health care costs compared with families in which no one smokes. It is in the mutual interests of employers, public and private sector

The U.S. Federal Government has been literally the world leader in establishing the science base in terms of the health effects of smoking — our Surgeon General's reports are read in every country in the whole world. And yet we have done so little in the face of so much evidence.

— Matthew Myers, J.D. Campaign for Tobacco-Free Kids

health insurers, and the health care system to work together to provide tobacco use cessation services to all who need them and thereby reduce health care costs, lost productivity, and suffering due to cancer and other diseases caused by tobacco.

Clearly, the most important thing individuals can do to reduce tobacco-related cancer risk is to cease using any form of tobacco. Individuals also can support anti-tobacco policies and programs (e.g., to prevent youth access to tobacco and improve anti-tobacco education in schools) and support mandated insurance coverage for comprehensive tobacco cessation services.

Environmental Tobacco Smoke (ETS) and Cancer

Cigarette smoke contains more than 4,000 chemicals (e.g., cyanide, formaldehyde, benzene, arsenic, DDT, acetylene, ammonia), including 69 known carcinogens as well as poisonous gases such as nitric oxide and carbon monoxide. These chemicals come from the tobacco itself and the combustion of the myriad substances added by manufacturers to make tobacco products more palatable. ETS causes approximately 3,000 lung cancer deaths each year among nonsmokers in the United States, and is a significant contributor to cardiac, respiratory, and other diseases in individuals exposed to it. In total, ETS exposure claims the lives of approximately 38,000 nonsmokers annually. There is no safe level of exposure to ETS.

The momentum toward passage of smoke-free laws has been gathering speed and received a significant push with publication of the Surgeon General's report on ETS. In addition to protecting nonsmokers, smoke-free laws are estimated to help the 70 percent of smokers who want to quit by providing them with public environments free from any temptation or pressure to smoke.

The strongest resistance to smoke-free ordinances typically comes from bar and restaurant owners, who fear a significant loss of business if smoking is prohibited on their premises. Such fears have proven to be unfounded. As of July 3, 2007, approximately 162 million Americans are living in locales with smoke-free ordinances. During the period from the beginning of the Panel's meetings (September 2006) until publication of this report (August 2007), at least 133 new smoke-free laws were passed by state, county, and local governments. However, despite the dramatic increases in the passage of smoke-free workplace laws, an estimated 30 percent of workers continue to be exposed to ETS, and exposure varies considerably by occupation. Bar and restaurant workers are among the most highly exposed.

Tobacco industry attempts to thwart smoke-free policies have been well documented. Smoke-free laws pose a major threat to tobacco sales because they reflect a changing culture in which tobacco use is becoming increasingly unacceptable. The industry continues to oppose new smoke-free laws and is actively pursuing ways of replacing revenues lost due to smoke-free ordinances and laws. To counter decreasing tolerance for smoking and smoke exposure, the tobacco companies are developing and marketing a growing number of smokeless products, including some that are spitless. These products allow smokers to maintain nicotine dosage and still comply with smoking restrictions. They also help the industry avoid losing as customers smokers who quit using cigarettes.

...in study after study after study in the localities and at the state level, when we do an analysis of what the revenues were before and after a smoke-free law passes, [the results] are always the same. Either it has had no impact whatsoever on revenues or it increased business. Smoke-free laws are good for health and good for business.

— Cynthia Hallett, M.P.H. Americans for Nonsmokers' Rights

Some individuals and families still permit smoking in the home, in the car, and around children, exposing family members and visitors to significant ETS levels. Changing this situation will require personal action. Individuals also can protect themselves and their families from ETS exposure by patronizing smoke-free businesses and voting for smoke-free local and state ordinances.

Conclusions

The President's Cancer Panel has long maintained that participants in the National Cancer Program include not just research institutions, health care entities, and patient advocates, but all of the institutions, organizations, industries, and individuals that by their action or inaction contribute to reducing or exacerbating the national burden of cancer. In large measure, cancer researchers and the acute care health system have been charged, albeit erroneously, with addressing the epidemics of obesity- and tobacco-related cancer morbidity and mortality. They cannot do this without a change in focus, and they cannot do it alone.

Policy decisions that would enable more people to choose cancer risk-reducing behaviors have been limited both in number and scope. Yet cancer control research evidence clearly recognizes the critical need for legislative, policy, and environmental changes to support individual behavior change. The public health infrastructure – which has enormous potential for promoting healthy behaviors – is underdeveloped and undervalued. The important roles of government at all levels, the health care and insurance systems, and entities not usually considered to be participants in the National Cancer Program – the media, city planners, employers, the agricultural system, the educational system, the food, beverage, and restaurant industries, to name only a few – have been underappreciated.

Who is Responsible for What?

Discussions of disease prevention almost inevitably include debate as to the relative responsibilities of the individual and institutions in addressing the issues discussed in this report. The Panel concludes that:

Government and institutions have an obligation to protect the public health. Citizens have the right to expect that the government and other influential institutions will not promulgate and support policies that cause direct harm to health or, by omission, allow harmful circumstances that require institutional intervention to go unaddressed. The power of policy as a behavior change strategy is well recognized and must be applied constructively and thoughtfully to reduce the toll of cancer associated with poor diet, inactivity, and tobacco. Population-level solutions are needed to help resolve the lifestyle-related problems contributing to cancer risk, and it is up to policymakers to authorize and support the implementation of such solutions.

The health care community must coordinate and integrate education and prevention messages related to obesity, diet and nutrition, physical activity, tobacco use, and environmental tobacco smoke exposure with educational

If you look at…what causes adult cancer globally, what causes it is generally exposures that people sustain from products that are mass produced by corporations and marketed…. tobacco…alcohol…fast food...chemicals and pesticides….The only way we're going to make any progress at all against any of these mass marketed goods is to have a partner in government that actually is willing to persuade corporations to start to think about doing things that are in the public interest.

— James Sargent, M.D.
Dartmouth-Hitchcock Medical Center

efforts related to other diseases that have common risk factors in order to leverage available resources and simplify and harmonize risk reduction messages. The health care community also has an important role in advocating for policy changes and for funding to support treatment and necessary research related to lifestyle factors and cancer.

Individuals must seek out information about the risks of poor diet, inactivity, tobacco use, and environmental tobacco smoke exposure and make personal choices to protect their health and that of their families. Individuals also have the power to raise political awareness of the importance of these issues and to create and reinforce political will. For example, individuals must insist that schools provide healthy food for students and that workplaces and public places are smoke-free.

Making It Happen

The Need for Political Will

All of the issues discussed in this report have suffered to varying degrees from politicization that continues to derail or limit progress toward a healthier population that is less burdened by cancer. We cannot continue to fund tobacco- and obesity-related research, thinking it will solve the problems caused by cancer risk-promoting behaviors and products, and also acquiesce to the demands of the industries that encourage those behaviors and produce those products. Changes in Administration or the appointment of Cabinet secretaries should not cause shifting political winds that result in conflicting policies or policies that limit or undo previous progress toward improved public health.

The leadership of this nation must summon the political will to:

- Be responsible members of the global community and immediately ratify the Framework Convention for Tobacco Control.
- Unmask and resist the tactics of disease vectors (the tobacco, food, and beverage industries) that are at the core of so much of the cancer and other chronic diseases that are sickening and killing Americans by the hundreds of thousands each year.
- Fund tobacco control efforts at least at minimum CDC-recommended levels in each state. With large increases in the Master Settlement Agreement payments to states beginning in 2008, now is an opportune time for states to make this commitment.
- Authorize the Food and Drug Administration (FDA) to regulate tobacco product contents and tobacco product advertising. The Panel recognizes that current FDA resources and infrastructure are insufficient to fulfill this crucial role. Therefore, adequate resources must be appropriated upon granting FDA this authority.
- Accept the rapid reduction and eventual elimination of tobacco use and environmental tobacco smoke exposure as a moral obligation and not export the problem to developing nations.
- Coordinate U.S. agricultural subsidy and public health policy related to diet and nutrition to improve the food supply and help ensure that all people have access to affordable, healthy food.

- Require the elimination of unhealthy foods from school breakfast and lunch programs – government at all levels must cease being a purveyor of unhealthy foods that lead to disease and increased health care costs.

- Enable effective regulation of food advertising, particularly in conjunction with children's television programming and in all other media targeting children. Voluntary efforts by the food and restaurant industries are a step in the right direction, but do not go far enough and lack governmental oversight.

- Fund improvements to the built environment, including sidewalks, safe lighting, playground refurbishment and construction, and neighborhood design that will enable and encourage people to become more physically active.

The Need for Significant Culture Change

The evolution of cultural norms and the exercise of political will are interdependent processes. Political will is necessary to implement policies that contribute to health and lead to changes in normative cultural behaviors. At the same time, political will is molded by public demand, and public demand is driven in part by cultural norms. Experiences with state and local policy changes related to environmental tobacco smoke exposure and other tobacco issues (e.g., taxes, youth access, advertising bans) provide ample lessons that can be applied to help make regular physical activity and healthy food choices the norm rather than the exception.

Public attitudes must be modified through policy, persuasion, and access such that it becomes the norm to be personally committed to a healthy lifestyle, for healthy food options to be readily available and affordable for all, and for tobacco use and tobacco smoke exposure to be viewed as unacceptable. The participation of government, employers, health care providers, media, other thought leaders, and individuals will be important to catalyze and sustain social change in these crucial areas.

The Need to Shift Health Care Emphases toward Disease Prevention

Likewise, the culture of the health care and health insurance systems must shift to a markedly increased emphasis on disease prevention rather than disease treatment. The prevention of disease through lifestyle behavior changes must be appreciated, integrated, and supported financially within the health care and health insurance systems. The ability of the current health care system to keep pace with the rapidly escalating needs for cancer and other chronic disease treatment related to obesity and tobacco use is unsustainable.

The Need for More Unified Efforts among Disease-focused Public and Non-governmental Agencies

The American public continues to be barraged – and confused – by a plethora of health information and recommendations. Numerous Federal, state, and prestigious non-governmental agencies have issued recommendations and guidelines, launched public education campaigns, and established Web sites with information, personal health tracking tools, and other components designed to help individuals and targeted groups adopt healthier lifestyles. Yet relatively few people are even aware that these recommendations and Web sites exist, in part because their promotion generally is limited and scattershot in approach, and also because their messages are lost in the din of health information "noise."

By focusing on risk factors common to the major chronic diseases affecting the population (e.g., cancer, hypertension, heart disease, diabetes), health promotion messages can be simplified to better educate the public about behaviors that will reduce the risk of specific diseases and contribute to overall health and well-being. Coordinated, active dissemination efforts designed to reach diverse populations must include fully the segments of the population that lack computer access or do not get health information from this source. These groups include but are not limited to the poor, the elderly, people with physical and mental disabilities, those with limited literacy and/or health literacy, and recent immigrants.

It also is crucial for public and private sector organizations to optimize available resources by taking full advantage of existing infrastructure. Community services addressing diet, nutrition, physical activity, and tobacco control should be integrated into cohesive wellness-oriented efforts rather than departmentalized. To be most effective, a workforce of regional or local coordinators or "sales representatives" will be needed whose principal role is to promote healthy lifestyles at the community level. These actions will require fiscal commitments, but expenditures can be minimized by leveraging the resources of all participating stakeholders.

Continued Research Needs

Specific cross-cutting research needs remain. Among the most important of these is research on ***behavior change*** – both its dynamics and how to achieve it long term at both individual and population levels. A better understanding of the mechanisms that support individual behavior and culture change will inform related ***health services research*** (e.g., evaluation of existing and new physical activity and nutrition interventions, data collection, studies of the economic savings achieved by companies that implement workplace wellness programs). Similarly, behavioral research will inform and improve research and practice in ***health communications*** to the population in general, and to populations of special vulnerability, such as cancer survivors, youth, women, minorities, and immigrants. Finally, ***policy research*** is required to ascertain how policy can best stimulate and reinforce interventions to encourage lifestyle choices that reduce cancer risk.

Other discrete areas of research emphasis identified at the Panel's meetings are listed on pages xix-xx. *However, the Panel believes strongly that the need for specific types of research should not and must not preclude firm and rapid action to implement in all segments of our population cancer risk-reducing policies and interventions that have been shown to be effective in both the United States and around the world.*

President's
Cancer
Panel

Recommendations

Overarching Recommendations

Elected officials, policymakers, and institutions have a moral obligation to protect the public health; they must assert their collective political will to change policies contributing to the obesity epidemic and continued tobacco use, both of which result in increased cancer risk and incidence.

The health care community (i.e., researchers, providers, and advocates) must coordinate and integrate education and prevention messages related to diet, nutrition, physical activity, and tobacco use and exposure with other diseases (e.g., diabetes, heart disease) to make the most of available resources and to simplify and harmonize common risk reduction messages. The health care community also has an important role in advocating for policy changes and funding to support necessary research related to lifestyle factors and cancer.

Individuals – to the best of their ability – must assume personal responsibility for learning about cancer risks associated with obesity and tobacco use in order to make healthy lifestyle choices for themselves and their families. In addition, individuals have an obligation to be proactive through advocacy and voting support to ensure that elected officials and other policymakers understand and are responsive to the public's desire for policies and programs that will enable them to make healthier lifestyle choices.

Diet, Nutrition, and Physical Activity	Responsible Stakeholder(s) and Other Entities
1. Adopt policies and provide funding to improve the built environment to encourage physical activity. For example: • Address safety issues that discourage physical activity. • Plan new communities that encourage physical activity. • Retrofit existing communities to encourage physical activity (e.g., install sidewalks, improve community centers, parks, playgrounds).	• Congress • Department of Housing and Urban Development • State and county legislatures • City planners
2. Coordinate U.S. agricultural subsidy and public health policy related to diet and nutrition to improve the food supply and help ensure that all people have access to affordable, healthy food. Specifically: • Structure farm supports to incentivize/encourage increased production of fruits and vegetables; limit farm subsidies that promote the production of high fructose corn syrup for use in food. • Support healthier food choices by restructuring regulations governing acceptable food choices allowed by the Women, Infants, and Children Program, Headstart, and school lunch programs.	• Congress (via the Farm Bill reauthorization) • Department of Agriculture • Department of Health and Human Services • State and local governments

Diet, Nutrition, and Physical Activity	Responsible Stakeholder(s) and Other Entities
3. Improve access to affordable, healthy foods in urban communities; implement "fair food" policies similar to fair housing policies.	• Department of Agriculture • State governments
4. Regulate and monitor food advertising in media targeting children.	• Food and Drug Administration • Federal Trade Commission • State governments • Food and restaurant industries • Print, broadcast, and other media producers and outlets
5. Reinstate physical education at meaningful levels in grades K-12 and expand physical activity offerings to include individually-oriented activities (e.g., yoga, weight training) that could be maintained for life. Though not an ideal measure, include body mass index (BMI) measurement, as adapted for youth, as part of school physical fitness assessments and provide this information to parents. Parents also should receive information about the relationship of BMI to disease risk and how to decrease BMI through behavioral change.	• Department of Education • Department of Health and Human Services • State and local boards of education
6. Replace unhealthy food choices in school food service facilities and vending machines with healthful foods and beverages. Include information in elementary and secondary school health curricula about the meaning of energy balance and how to read and interpret food labels and other health information related to diet and nutrition.	• Department of Education • Department of Agriculture • State and local boards of education
7. Make nutrition information about restaurant foods readily available on menus and understandable to customers.	• Food and restaurant industries
8. Increase support and incentives for employee wellness (e.g., diet, fitness). Provide healthier choices in workplace food service facilities/vending machines and provide economic subsidies that encourage healthy food choices.	• Employers
9. Provide coverage for nutrition counseling and fitness promotion as part of all comprehensive health benefit packages as an accepted mechanism for reducing risk and preventing disease.	• Health insurance companies • Centers for Medicare and Medicaid Services • Veterans Administration • Civilian Health and Medical Program of the Uniformed Services • Indian Health Service
10. Measure BMI as part of routine physical exams and counsel patients about the meaning of this measurement. Educate patients about the necessity of balancing food intake and physical activity to avoid and reverse obesity.	• Primary care and other health care providers
11. Seek out opportunities to increase personal and family fitness and health.	• Individuals and families

Tobacco Use Prevention and Treatment; Environmental Tobacco Smoke Exposure	Responsible Stakeholder(s) and Other Entities
1. Ratify and fully implement the Framework Convention for Tobacco Control. Key provisions include: comprehensive bans on tobacco advertising, promotion, and sponsorship, larger and stronger warning labels on tobacco product packaging, provision of tobacco addiction treatment, disclosure of tobacco product ingredients, and public protection against environmental tobacco smoke exposure.	• President • Congress
2. Authorize the Food and Drug Administration (FDA) to strictly regulate tobacco products and product marketing. FDA must receive sufficient funding and personnel to carry out this crucial role.	• President • Congress
3. Increase the Federal excise tax on tobacco products.	• Congress
4. Require all Federal facilities to be smoke-free.	• Congress • Federal agencies
5. Reallocate existing National Cancer Institute, Centers for Disease Control and Prevention, and other Federal resources to better mirror the tobacco-related disease burden and capitalize on and opportunities for progress.	• Congress • Department of Health and Human Services (National Institutes of Health, Centers for Disease Control and Prevention, Health Resources and Services Administration, Substance Abuse and Mental Health Services Administration) • Veterans Administration
6. Add the conduct of meaningful tobacco-related activities to the evaluation criteria for NCI-designated Cancer Centers.	• National Cancer Institute
7. Reduce the influence of the tobacco industry: • U.S. political parties and individual candidates should refuse campaign contributions from the tobacco industry or its subsidiaries. • Prohibit recipients of National Cancer Institute grants and contracts from accepting money from tobacco companies or their subsidiaries. Other Federal agencies should consider similar requirements.	• All U.S. political parties • National Cancer Institute
8. Strengthen anti-tobacco efforts at the state and local levels: • Increase state commitment of Master Settlement Agreement funds and/or tobacco tax funds for tobacco control programs to at least the minimum level recommended by the Centers for Disease Control and Prevention for each state. • Pass smoke-free ordinances for all public and private workplaces and public spaces. • Encourage state governments to further increase tobacco excise taxes to discourage purchase of cigarettes and other tobacco products. • Require all public schools and universities to be 100 percent smoke-free.	• State and local governments

Tobacco Use Prevention and Treatment; Environmental Tobacco Smoke Exposure	Responsible Stakeholder(s) and Other Entities
• Require state-funded programs (e.g., Medicaid, corrections, mental health) to offer smoking cessation services. • Ensure that all state cancer control plans include a tobacco control component.	
9. Develop and provide evidence-based multimedia curricula and educational materials in grades K-12 on the dangers of tobacco use and tobacco smoke exposure and the role of the tobacco industry in promoting tobacco use. Encourage colleges and universities to disseminate tested anti-tobacco messages for the 18 to 24 year-old age group through campus radio and television stations, Web sites, and print publications.	• Department of Health and Human Services (National Institutes of Health, Centers for Disease Control and Prevention, Food and Drug Administration) • State and local boards of education • Non-governmental organizations
10. Cease including images of smoking in movies, television, music videos, video games, and other visual media with child, adolescent, and young adult audiences.	• All visual media producers
11. Prohibit smoking in and around the workplace. Support worker efforts to quit smoking; provide incentives for cessation.	• Employers
12. Make coverage of tobacco use cessation services and medications a standard benefit in all comprehensive health benefit packages.	• Health insurance companies • Centers for Medicare and Medicaid Services • Veterans Administration • Civilian Health and Medical Program of the Uniformed Services • Indian Health Service
13. Incorporate smoking cessation services into the comprehensive care of cancer patients, survivors, and their family members.	• Cancer centers • Academic and community hospitals and medical centers • Private oncology offices/practices • All publicly-funded clinics and health centers
14. Adopt the Agency for Healthcare Research and Quality *Guidelines for Clinicians Treating Tobacco Use and Dependence* as part of the standard of care for all health care providers.	• Primary and other health care providers
15. Quit smoking and use of any smokeless tobacco products. Prohibit smoking in the home and car. Protect children from exposure to smoking in movies and smoking role models. Patronize only smoke-free restaurants and other businesses.	• Individuals and families

Research Needs

Cross-Cutting

Conduct research on:

- Interrelationships of multiple lifestyle factors and the dynamics and mechanisms of achieving/maintaining behavior change in individuals and populations.
- Health services utilization, including data collection and studies of the economic savings achieved by companies that implement workplace wellness programs; evaluation of existing and new physical activity, nutrition, and tobacco prevention and cessation interventions.
- Health communications (e.g., to the population in general, and to populations of special vulnerability, such as cancer survivors, youth, racial/ethnic minorities, immigrants).
- The impact of poverty, gender, and race/ethnicity across the life span to support intervention development and reduce health disparities.
- Policy-related interventions that would improve the effectiveness of programmatic or therapeutic interventions.
- How current and emerging communication technologies (e.g.,V-chip) can be used to minimize media exposure to images of smoking and advertising for unhealthy foods.
- Data collection to document health status improvements and cost savings due to lifestyle behavioral interventions.

Diet, Nutrition, and Physical Activity

Expand research on:

- The influence of dietary elements, weight loss, and/or physical activity on cancer biomarkers, preneoplastic changes, and incidence of specific cancers, including biological mechanisms linking energy balance and cancer.
- "Fitness genes," other gene pathways, and biomarkers that influence the effect of physical activity on cancer risk and identify population subgroups that will benefit the most from increased activity to reduce cancer risk.
- Mechanisms of food addiction and possible parallels to other addictions.
- The role of energy balance in cancer survivorship (e.g., prognosis, recurrence, survival, comorbidities, and quality of life).
- Mechanisms involved in protective effects of physical activity on cancer recurrence and mortality and on improved function following cancer treatment; cardiac rehabilitation may serve as a model for resultant programs.
- The relationship between socioeconomic position and obesity.
- The impact of the built environment on physical activity.
- The role of high fructose corn syrup, food additives, and chemicals in obesity.
- Intervention studies to inform prediction of the impact of physical activity on cancer risk.
- Tools for measuring diet, physical activity, and obesity (e.g., BMI).

Tobacco Use Prevention and Treatment; Environmental Tobacco Smoke Exposure

Government and the non-profit and private sectors should collaborate as appropriate to design and conduct anti-tobacco campaigns, particularly targeting vulnerable populations (e.g., 18 to 24 year-olds, the poor, low literacy populations).

Require the collection of information on smoking status and exposure to environmental tobacco smoke on participants in all federally-sponsored clinical trials.

Key Federal research agencies/sponsors (e.g., National Cancer Institute; National Heart, Lung, and Blood Institute; National Institute on Drug Abuse; Centers for Disease Control and Prevention) addressing diseases caused by tobacco use and tobacco smoke exposure should have an intramural tobacco research program.

Sponsor research on:

- Communication interventions needed to further strengthen public attitudes that smoking is unacceptable.
- The dynamics and mechanisms of behavior change relevant to tobacco use prevention and cessation, including studies specific to particularly vulnerable populations such as the poor, ethnic/racial minorities, individuals with low literacy levels, persons with mental illness and/or addictions, active military and veterans, cancer survivors, and individuals with comorbid conditions.
- How current and emerging communications technologies can be used to reduce exposure to media images of smoking and other detrimental lifestyle behaviors.
- Biochemical mechanisms of nicotine addiction to inform the development of more effective treatment strategies.
- Methods of assessing the type, amounts, and toxicity of constituents in cigarettes and other tobacco products and measures to evaluate smoke chemistry, human toxicant exposure, harm, and addiction.
- Methods for quantifying individual smokers' risk of lung cancer based on combinations of genetic and environmental variables.
- Policy-related interventions that would improve the effectiveness of tobacco control interventions.
- The impact of changes in tobacco industry products and marketing strategies/tactics on tobacco use initiation and related cancer morbidity and mortality both in the U.S. and globally.