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National Institutes of Health Research Priorities Q&A

How does the National Institutes of Health (NIH) decide its research priorities?

Research priorities are driven first and foremost by the science and by researchers in laboratories, hospitals and academic medical centers across the country who spend years studying biomedical and behavioral health issues. However, it is not the science alone that drives NIH priorities. Institute directors, NIH staff and Advisory Council members also consider the burden of specific diseases, the public health needs of society, existing scientific opportunities, the quality of individual research proposals, the experience of the applicant, and the ability to sustain research through adequate staffing and infrastructure. Unfortunately, when focusing solely on any one of these factors, advocates and policy-makers oversimplify the importance of a complex multi-layer system for determining fund allocation.

It is impossible to know with certainty which area will produce the next important discovery. Accordingly, the community of science, of which the NIH is a part, has to be open to all ideas. While no one field has all the answers, investigators in many different fields can ask the questions that will provide additional knowledge about disease and health. It is by asking as many questions as possible that the NIH can identify and pursue the most promising medical priorities.

How are individual grants awarded?

The NIH uses a rigorous peer review process to determine which grant applications to fund. Thousands of scientists each year submit applications to the NIH requesting funding for their scientific proposals. Applications are evaluated initially by the NIH's Center for Scientific Review and peer review groups composed of scientific experts from around the U.S. and the world. These groups (also called "study sections") assess and rate the scientific and technical merit of the proposed research or training projects. Projects reviewed in a particular session are scored and ranked in relation to each other. The applications are then assigned to one of the 27 institutes and centers at NIH. A second level of peer review is conducted by the NIH National Advisory Councils of the respective funding Institutes or Centers, which are composed of both scientists from the research community and public representatives. These councils ensure that the NIH receives advice from a cross-section of the U.S. population in its deliberation and decision-making.

This system ensures that research conducted and supported with taxpayer dollars is scientifically meritorious and serves to improve the lives of all people equally. Approximately 70 percent of meritorious, scientifically valid proposals do not receive funding through this process. The grants that receive funding, however, are the best in their fields.

Why does NIH support research that isn't specifically disease related?

Basic biomedical and behavioral research is the foundation for developing new treatments and interventions for all diseases that affect individuals. Understanding how cells operate and how normal biological systems function is key to understanding how diseases alter the appropriate functioning of the body. Likewise, understanding normal cognitive, behavioral and social development is key to understanding abnormal behavioral disorders and emotional disturbances. Basic research into biological systems, behavioral factors, genetics and technologies has applications down the road for many diseases that are not readily apparent in either the grant application or in the study results. Many areas of basic research in cancer, for instance, had applications for the treatment of HIV/AIDS. Basic behavioral research into mental processes has informed the treatment and prevention of heart disease, diabetes, and obesity.

In 2001, the National Academy of Sciences identified ten priority research areas for the behavioral and social sciences at NIH, including, "predisease pathways" and "positive health outcomes." Predisease pathways refers to the biological influences (e.g. genetic factors, endocrine and immune factors) and related links to behavioral, psychological and social influences that precede sickness and death. There is a primary need to assess disease precursors long before development of negative outcomes. Detection of these 'early warning signs' may predict later illness. For example, negative personality characteristics, including hostility, are associated with a variety of negative health outcomes, including heart disease.

As an agency focused on health, NIH needs to understand why some people thrive and flourish in negative circumstances, just as it's also important to understand why some people get sick. NIH has funded research demonstrating that those with psychological strengths show delayed onset of symptoms as well as improved survival. Optimism has been shown to be a very important personality trait in health studies. Positive expectations have been shown to predict better health after heart transplantation; optimists have also been documented to show quicker recovery from coronary bypass surgery and have less severe anginal pain than pessimists. In men who are HIV-positive, optimism has been shown to predict disease course and mortality. The physical mechanisms through which personality characteristics "get under the skin", however, are not well understood.

Along similar lines, basic research on self-esteem has provided key insights into the nature of depression, bipolar disorder, and eating disorders. It is easy to make light of studies that focus on self-esteem in college students, but this ignores the fact that low self-esteem is a major risk factor for depression and that both low and unstable self-esteem are part of the Diagnostic Statistical Manual (DSM-IV) definition of common eating disorders such as bulimia and anorexia nervosa.

Why does NIH study behavior?

Six of the ten leading causes of death in the United States are behaviorally based, including HIV/AIDS, smoking, violence, accidents, diet, and substance abuse. Other behavioral factors are also known to increase an individual's risk for disease, disability and early death: obesity, physical inactivity, inadequate social support, environmental contaminants, anxiety, and traits of anger, hostility or depression.

In addition, the significant factors driving the exponential increases in health care costs are the aging U.S. population, and the rapid rise in chronic diseases. Many of these diseases are caused or exacerbated by behavioral factors: for example, obesity, caused by sedentary behavior and poor

diet; and addictions and resulting health problems caused by tobacco and other drug use. Further, nearly 125 million Americans are living with one or more chronic conditions, like heart disease, cancer, diabetes, kidney disease, arthritis, asthma, mental illness and Alzheimer's disease.

NIH is the premier biomedical and behavioral research institution in the world. Its mission is to support science to improve the health and well-being of all humanity. At a time when genetic control over diseases is tantalizingly close but not yet possible, knowledge of the behavioral influences on health is a crucial component in the nation's battles against the leading causes of morbidity and mortality. Appropriately, NIH supports a large and robust portfolio of research on all aspects of human development and disease.

These grants and grantees are funded with taxpayer money. What's wrong with demanding accountability?

The NIH is the most prominent, respected and trusted medical research agency in the world. Much of its reputation is based on the integrity of a rigorous peer review process that operates without political influence, ensuring that the research conducted and supported by the NIH is based upon scientific merit, rather than on political, ideological, or sectarian considerations.

Congressional oversight of the peer review process in general-- to guarantee that the process is fair and is allowed to function free of politics or prejudice--plays an important role in ensuring appropriate accountability for the nation's investment in scientific research. In addition, researchers supported by NIH are required to provide periodic progress reports and are in regular contact with program and grant administrators to ensure scientific, ethical, and fiscal accountability.

Public scrutiny of the federally supported science agenda is beneficial, but there is a difference between oversight and the harassment of scientists. The NIH has undertaken an aggressive strategic plan to further clinical applications of research known as the NIH Roadmap Initiative. Individual institutes, such as the National Institute of Mental Health, have begun reorganizing to better focus on translating basic research into clinical applications. The current structure of NIH provides for this flexibility and will allow NIH to refocus its efforts on areas of science that are the most promising. These approaches are preferable to a system of congressional micromanagement that has a chilling effect on research and restricts free scientific inquiry.

What are the benefits of social and behavioral research?

Behavioral and social sciences research supported by NIH is increasing knowledge about the factors that underlie positive and harmful behaviors, and the context in which those behaviors occur.

Aging

Behavioral and lifestyle factors have a profound impact on health throughout the lifespan. Older adults can help to prevent disease and disability and improve their quality of life through healthy behaviors such as proper nutrition, exercise, use of preventive health care, and avoiding smoking and alcohol use. Data reveals that mortality rates have shown steady and significant declines in industrialized countries. NIH-supported research continues to collect and analyze demographic data that inform public policy and planning for health, economic, and social needs of a growing older population. The implications of these studies are important. Better functioning among

growing numbers of older people could help hold down the demand for health care and, in turn help to reduce health care costs, over and above investments in research, preventive health care, and treatment that might be needed to maintain or accelerate the decline in disability rates in older Americans.

Alzheimer's Disease

Most of the approximately 4 million Americans with Alzheimer's are cared for outside the institutional setting by an adult child or in-law, a spouse, another relative, or a friend. Caregivers frequently experience significant emotional stress, physical strain, and financial burdens, yet they do not receive adequate support. Social and behavioral research demonstrates that the wellbeing of the caregiver and care recipient is closely related. The greater the level of depression in the patient, the greater the level of depression in the caregiver. Spouses of Alzheimer's patients and caregivers in poor health themselves are at particular risk for depression. Accordingly, the findings support interventions for caregivers early on in the family member's illness. Similarly, social and behavior research demonstrates that women caring for a family member with dementia can benefit from an exercise or nutrition program. In an NIH-funded study, caregivers who exercised showed significant improvements in physical activity levels, stress-induced blood pressure reactions, and sleep quality. Both interventions, however, provide significant improvements in psychological distress, including depressive symptoms and self-rated stress levels.

Diabetes

Findings from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) supported Diabetes Prevention Program (DPP), a major clinical trial comparing diet and exercise to treatment with a drug in 3,234 people with impaired glucose tolerance, a condition that often precedes diabetes, found that lifestyle changes in diet and exercise and losing a little weight can prevent or delay the disease.

The study makes clear that behavioral and social factors play a major role in the management of diabetes and its accompanying complications.

Heart Disease

About 50 million adults in the U.S. have high blood pressure, a major risk factor for coronary heart disease, stroke and heart failure. While there are more drugs, non-drug interventions and well-tested plans of care available now that can control high blood pressure and decrease cardiovascular disease risk, barriers exist that hinder implementation of these approaches. Behavioral research shows that sustained prevention and treatment success requires lifestyle interventions to prevent and control the disease, and to prevent or delay the complications related to high blood pressure. Those lifestyle changes include increasing aerobic physical activity, maintaining a healthy weight, limiting consumption of alcohol for those who drink, and reducing salt and fats in diet that includes more fruits and vegetables. A decade-long program of progressively complex research has been effective in translating into practice the research about high blood pressure, health disparities, and the care needs of a targeted population.

Researchers studying factors that may predispose young adults to develop heart disease found that hostility correlates strongly with the subsequent development of coronary calcification, a precursor to heart disease. This association persisted even when demographic, lifestyle, and physiological variables were taken into account. In addition to providing insight as to the potential causes of heart disease, the study indicates a potential preventive strategy. Taken with earlier

studies that showed how hostility levels may be reduced through behavioral therapies. The results suggest that interventions to reduce hostile attitudes and behaviors may prevent atherosclerosis and thus ameliorate the burden of heart disease.

HIV/AIDS

NIH-supported behavioral and social research has made important contributions to HIV prevention and control in a range of population groups and settings – both domestic and international. Basic research projects have expanded our understanding of the psychosocial factors and processes that influence HIV-related risk and vulnerability, as well as that protect people from HIV infection. Intervention studies have demonstrated efficacy in a number of HIV prevention measures, including delaying sexual debut, reducing the number of sex partners, increasing the use of condoms, and increasing referral to drug and alcohol addiction treatment programs. Together, these studies have contributed to behavior changes that underlie the reduction in HIV incidence in the U.S. from its peak in the mid-1980s. HIV-related social and demographic research also has revealed much about the impact of AIDS on family and household structure and function, community stability, and economic and national security-especially in developing countries where AIDS has ravished whole generations of the working-age population.

Learning

The ability of students to think, learn, and communicate is key to their success throughout life. Research shows that events and experiences from conception onward have a critical influence on the developing brain. This knowledge offers hope that changes in children's environment can help them overcome learning and developmental disabilities, regardless of socioeconomic status. Behavioral and applied research helps educators, physicians and policymakers develop the most effective, scientifically-based interventions for fostering early educational competence in our children.

Mental Health

Depression and anxiety disorders are very common among older adults. For many, the commonly prescribed antidepressant and anti-anxiety medications are either insufficient or unsuitable due to other medications given. Behavioral research suggests that cognitive behavioral forms of psychotherapy may be useful as alternative or supplemental treatments for depressed older adults when medications alone are insufficient or contraindicated due to other medications. Accordingly, this form of therapy is considered as a key component in reducing

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If you have any questions, please contact CPR's Co-Chairs, Angela Sharpe of the Consortium of Social Science Associations at alsharpe@coffa.org or (202) 842-3525 or Karen Studwell of the American Psychological Association at kstudwell@apa.org or (202) 336-5585

