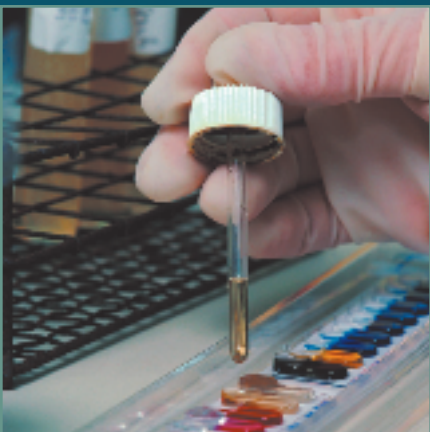


2004 Task Force On Aging Research Funding

Meeting the Needs of the 21st Century



**Urging Congress and the President
to embrace these recommendations:**

Uphold a National Commitment to Medical Research

Make Age-Related Research a Greater Priority

Increase Awareness of the Potential Opportunities for Healthier Aging

Leadership, Commitment, Hope:

The 21st Century Challenge

Fifty percent of the public believes we should be spending more on medical and health research, with an overwhelming eighty percent supporting basic research even if it brings no immediate benefits.

(from Research!America/ Charlton Research Company, "America Speaks: Poll Data Summary Vol. 5, 2004. pp.15-16).

The 20th century witnessed amazing advances in human health and longevity thanks to public health measures and medical research breakthroughs. Because of the National Institutes of Health (NIH), the United States has led the world in reducing the impact of scores of diseases. The achievements of NIH are burnished by bipartisan political support and the unwavering faith that Americans place in medical science. Fifty percent of the public believes we should be spending more on medical and health research, with an overwhelming eighty percent supporting basic research even if it brings no immediate benefits.

The Task Force for Aging Research Funding, a non-partisan alliance of foundations, disease advocates, patients, and activists, speaks to the public interest by monitoring and encouraging additional scientific breakthroughs. We present this annual report to Congress highlighting both recent advancements in medical research and new health technologies, and the need for increased funding for the National Institutes of Health.

This Task Force issued its first report to Congress in 1988. Since then, we have seen enhanced bipartisan support for medical research in the Congress and in the White House. Beginning in 1998, Republican and Democratic legislators set an audacious goal of doubling the funding for the NIH – from \$13.6 billion in 1998 to \$27.3 billion in 2003. As a direct result of this infusion of resources within the NIH, scientists have yielded a myriad of scientific achievements, which will further improve the longevity and the quality of lives for millions of Americans. Proof that research pays off is demonstrated by a clinical trial that showed a reduction in stroke of up to 80% among victims of atrial fibrillation, a common heart condition characterized by an irregular heartbeat, after using warfarin or aspirin, and the 60% increase in the five-year survival rate for people with cancer. Very recent findings now show:

- Early detection of a protein in the blood – known as autoantibodies – may predict Lupus disease years before the disease is manifest, giving physicians and patients a

head start on monitoring and reducing the impact of Lupus.

- Older smokers exhibit age-related mental decline five times faster than people who never smoked. Even among former smokers, mental decline occurred nearly twice as fast as in those who never smoked.
- Treatment with cardiovascular drugs called ACE inhibitors may also reduce dry eye syndrome, a common disorder in the elderly that can seriously impact quality of life.

Just as the U.S. is poised to reap the fruits of its investment in NIH, continued funding progress has been seriously slowed. The annual budget boost for the current fiscal year dropped to 3%. The White House has recommended only a 2.6% budget enhancement for FY 2005. When higher rates of inflation in biomedical research are taken into the equation, along with significant funding increases for bio-terrorism research that are counted within the NIH budget, federal funding for disease research will actually decline in the coming fiscal year. In the professional judgment of the nation's leading research authorities, an 8-10% increase is needed for the NIH to take advantage of current scientific opportunities and to meet the goals of medicine in the 21st century.

Unpredictable and inconsistent budgeting for the nation's leading medical science enterprise poses a real threat to the future well-being of our people. Alternating boom and bust cycles in funding are highly destructive to good management of any enterprise. Funding stability and consistency is needed for success of multi-year research projects, for stable teams of research scientists, and for training and career development of new researchers.

The aging of the U.S. population provides the most cogent argument for tending to the long-range healthy growth and stability of the medical research enterprise. In 25 years the number of older Americans age 65 and older will double to more than 70

million seniors. The numbers of people age 85 and above will increase four-fold with the graying of the Baby Boom. People aged 100 or more – currently there are 70,000 – will increase 10 times before we are halfway through this century. This demographic tsunami will affect every institution and every community, and will touch all of us personally.

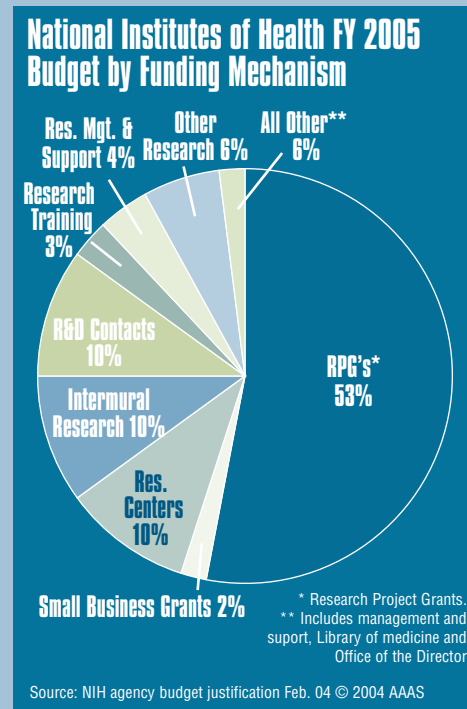
The most dramatic and costly impact of the longevity revolution likely will be felt on the troubled U.S. health care system.

According to the Centers for Medicare & Medicaid Services, health care spending is increasing by nearly 10% a year and was \$1.6 trillion in 2002. Imagine the cost increases when the leading edge of the Baby Boom moves into Medicare in 6 years if research has not reduced the incidence and impact of age-related diseases and disabilities.

- Cardiovascular diseases (CVD) including heart attack and stroke remain the country's No. 1 killer of men and women, causing nearly 40% of all deaths in the US, at a projected cost of \$368 billion in medical expenses and lost productivity for 2004.
- As many as 4.5 million people currently suffer with Alzheimer's disease, a number expected to be as many as 16 million by 2050. Today's costs of care for Alzheimer's victims, upwards of \$60,000 a year, will grow exponentially.
- Nearly 19 million adults have been diagnosed with depressive disorders, the leading cause of disability, costing the economy \$43.7 billion in treatment and lost productivity.
- Vision impairment so severe as to require assistance in performing activities of daily living is one of the most feared limitations on personal independence. By 2020, an estimated 5.5 million Americans will suffer such visual impairment, with costs exceeding \$50 billion a year.
- More than 18% of Americans over age 60

have diabetes with costs an estimated \$132 billion – that's about 10% of all health care spending for one disease among older Americans!

A wealth of studies, as well as common sense, hold that reducing the incidence and severity of age-related diseases is a sound and effective strategy for reducing the future burden of disabilities among older people and the attendant great costs to the economy.



The debate over health care financing in Washington, DC, too often focuses narrowly on the cost of health care, rather than the cost of disease. Even modest reductions against diseases and the damage they do can yield impressive savings. For instance, it is estimated that delaying the onset of diseases of aging can reduce years of costly dependence on medical and long term care facilities. Thus, if current research efforts could postpone by just five years the onset of Alzheimer's disease, to name just one threat to the elderly, the nation would realize an annual savings of more than \$50 billion! If declining capacities of Medicare beneficiaries to live independently could be stabilized over the course of a single calendar year, by targeting loss of mobility, memory, continence

and sensory abilities, more than \$27 billion additional monies could be saved.

But to delay symptoms of Alzheimer's and other age-related ailments will require new insights from the laboratory, and accelerated development of new therapies from clinical trials. Past investments in research have produced the healthiest, least disabled generation of older persons ever. More research leads to additional medical discoveries, new pharmaceutical products, and innovative assistive devices and technologies for better overall health and independence. Past advances from research have lowered the costs of illness by reducing the incidence or eradicating diseases, shortening hospital stays and diminishing the invasiveness of surgery.

Congress must now uphold the promise of medical research by restoring upwards momentum to the budgets of the National Institutes of Health and other health research agencies. In this report for 2004, the Task Force for Aging Research Funding details the costs and the cost-savings potential of health research in 26 categories, alphabetically arranged from "Aging and the Environment" to "Women's Health." The member organizations of this Task Force are ready and eager to work with and educate policymakers and staff on their opportunity this year to win appropriately higher levels of funding for medical research on behalf of a growing constituency for healthy aging in America.

"There has been a scientific revolution in the last few years...NIH is uniquely positioned to spark the changes that must be made to transform scientific knowledge into tangible benefits for people."

NIH Director, Elias Zerhouni, M.D

Aging and the Environment

- Older Americans are more at risk to environmental hazards in their everyday environment. Daily contaminants harmful to the elderly include microorganisms in drinking water (e.coli and cryptosporidium), pesticides and cleaning solvents (VOCs), neurotoxins lead and mercury, extreme temperatures, and indoor and outdoor air pollutants, which exacerbate heart disease, stroke and chronic lung disease.
- Older adults account for 75% of all hospitalizations due to gastroenteritis and other waterborne diseases. The highest death rates due to intestinal disease are seen among individuals age 75 and older. While the elderly account for a low percentage of poison control center reported incidents (2.8%), they account for 5.9% of all cases with a moderate to major medical outcome and 28% of the deaths. Thus once exposed, the elderly are twice as likely to experience a serious outcome and ten times as likely to die from that exposure.
- Research at Wayne State University, Henry Ford Hospital in Detroit, and the University of Washington, in connection with the NIH, has shown that long-term, occupational exposure to certain combinations of metals and oxidative stressor environmental agents (pesticides and heavy metals) is significantly associated with acquiring Parkinson's disease in later years. These studies are the first to link long-term (20 or more years) occupational exposure to these contaminants with a chronic neurodegenerative disorder.
- Through its Aging Initiative, EPA is working to meet the challenge posed by environmental hazards. A major

goal of the Aging Initiative is the development of a National Agenda for the Environment and the Aging to prioritize environmental health hazards that affect older persons, examine the environmental impact of an aging population in a smart growth context, and encourage civic involvement among older persons in their communities to reduce hazards. The National Agenda for the Environment and the Aging will help guide the Agency's work to protect the health of older persons now and in the future.

- Further investigation and study is still needed to uncover the gaps that exist within the modest research that has been conducted on the effects of environmental hazards on the aging population, the tools that can address the impact of aging society on our environment, and the development of future models to help reduce environmental hazards on local communities.

Alternative Medicine

- The use of herbal remedies within the U.S. increased 380% between 1990 and 1997. More than four in ten adults in the United States (42%) have used some type of alternative care in the past year. People age 50 to 64 are most likely to use complementary and alternative medicine.
- In a recent study, 81% of those Web sites that sold an herbal product or directly linked to a vendor also made direct health claims, yet they often lacked clinical information or FDA advisories. However, in a 2002 Pew Internet Project survey, half of the participants believed that "almost all" or "most" online health information is accurate or credible.

- A study on osteoarthritis in the elderly, conducted by researchers at the University of Maryland, found that acupuncture helped 7 out of 29 patients avoid surgery that would have cost an estimated \$63,000 per person.
- 27% of the patients treated with Gingko Biloba in its EGB 761 form achieved at least a four-point improvement in cognitive performance as measured by the Alzheimer's Disease Assessment Scale-Cognitive Subscale.
- The NIH-funded Centers for Research on Complementary and Alternative Medicine Program conducts studies on the effects of therapies used as alternatives to invasive surgery for maladies such as coronary artery disease, a condition that affects approximately 7 million Americans and is the leading cause of death among men and women. Current research priorities for FY 2004 for the Centers include studies on the use of alternative medicine for the treatment of arthritis, cardiovascular disease, infectious diseases, neurological diseases like Alzheimer's disease, and pain management, among many other conditions that affect millions of Americans.



Alzheimer's Disease

- An estimated 4.5 million Americans suffer from Alzheimer's disease, which is the 4th leading cause of death in the country. By the time the Baby Boom generation reaches the age of greatest risk, as many as 16 million persons could be affected.
- Alzheimer's disease is draining more than \$100 billion annually from the nation's economy, costing American business \$61 billion annually. The cost of care for a person with AD in a facility is approximately \$64,000 per year. The average lifetime cost of care for an individual with Alzheimer's disease is \$170,000. Left unchecked, it will overwhelm the nation's health care system and destroy the financial security of millions of American families.
- Scientists believe that Alzheimer's disease begins to attack brain cells at least 20 years before its symptoms become apparent. By then, it is too late to reverse the destruction of brain cells. Currently, there is no cure for Alzheimer's. Although current drugs cannot alter the progressive loss of brain cells, they may help minimize or stabilize symptoms. These medications may also delay the need for nursing home care.
- The steady investment that Congress has made in Alzheimer's research over the past 20 years is paying off. Science is at the point where effective treatment and prevention of Alzheimer's disease is now within reach. Recent NIH-funded research has led to the discovery of 3 genes that influences aging and the onset of Alzheimer's disease and other neurodegenerative conditions. Additionally, 39 new, NIH-funded clinical trials are currently underway.

Arthritis

- One in three adults, or 70 million people in the United States, are affected by arthritis and other rheumatic conditions according to a survey by the Centers for Disease Control and Prevention (CDC) released in the fall of 2002. As the U.S. population ages, this number is likely to increase dramatically. The number of people age 65 and older who have arthritis or chronic joint symptoms is projected to nearly double from 21.4 million people in 2001 to 41.4 million people in 2030. Arthritis and other chronic joint problems are the leading cause of disability among adults in the U.S.
- Arthritis costs the United States \$86 billion annually, which includes \$51 billion in medical costs. These figures underscore the need for urgent measures to be taken to reduce disability from arthritis and curtail the rising costs associated with this chronic condition.
- Arthritis results in 36 million ambulatory care visits a year and 750,000 hospitalizations annually.
- Recent NIH-funded studies at the National Institute of Arthritis and Musculoskeletal and Skin Diseases shed new light on the role of a protein called pyrin in controlling the inflammation that occurs as part of the body's normal disease-fighting response to infection, as well as new treatments for osteoarthritis, such as COX-2 inhibitors, which reduce joint pain and inflammation, while protecting the stomach lining from ulcers and bleeding.
- Research on the horizon includes studies on biologic response modifiers to stimulate cartilage growth and repair, and the use of soft-tissue grafts to help regenerate new articular surface, reducing the need for joint replacement.

ment. Developing a rheumatoid arthritis vaccine and identifying triggers that initiate arthritis in susceptible individuals are other research priorities.

Autoimmunity

- Autoimmune diseases are chronic disabling disorders in which underlying defects in the immune response lead the body to attack its own organs and tissues. Some of the diseases include lupus, multiple sclerosis, autoimmune thyroid diseases, myasthenia gravis, and scleroderma.
- Autoimmunity is not related to AIDS (in which an acquired virus attacks the immune system) nor is it a form of cancer. Autoimmune diseases are not contagious or infectious, but they can cause major organ damage and can be life-threatening.
- There are more than 100 known autoimmune diseases. 1 in 5 Americans or 20% of the population has an autoimmune disease with approximately 75% of those affected being women. Autoimmune diseases are a leading cause of death among women and children in the United States and cost approximately \$120 billion in health care costs annually.
- In 2000, the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) awarded nearly \$4 million for new projects on autoimmune diseases. These funds came as part of a \$30 million allocation from Congress to the National Institutes of Health (NIH) to bolster research in autoimmunity.
- Researchers have found "family clusters" of autoimmunity; persons with autoimmune diseases often find that many members of their family also have an autoimmune disease.

The Biology of Aging

- Researchers studying aging in nematodes (roundworms) have found that by altering certain genes, they can substantially extend the normal life of these tiny organisms. This exciting research may lead to the discovery of the genetic and biologic secrets to longevity in humans.
- Scientific research into telomeres, the tails at the ends of every chromosome that keep them intact, may hold the answer to understanding cell replication and cellular aging. These repetitive DNA sequences that appear to help regulate cellular replication have led researchers to learn more about telomere structure and function as a possible “clock of aging.”
- Studies of mammalian diets strictly controlled for calories currently underway at the University of Wisconsin, University of Maryland, University of California at San Francisco, and the NIH are showing promising results in extending their lifetime by 30 to 40 percent. These results, described as “stunning” by gerontologists, have raised hope that further studies of caloric restriction will uncover the mechanisms responsible for disease in old age.
- Scientists are working to determine what “longevity genes” are and how they work. There may be a group of genes in each species that can extend life beyond what is presently considered the maximum life span. These longevity-enabling genes could open the gateway to understanding the roots of biological aging in humans and provide revolutionary cures in treating age related diseases.
- Currently, the NIH spends only about .67% of its budget to study the biology

of aging at the NIA. The biology of aging program is just one-fifth of the NIA’s \$994 million budget, which also supports research programs in geriatrics, the behavioral and social sciences, and neuroscience. Scientists determined that these key areas of research, which are under funded, could provide the scientific knowledge base that would result in new insights into aging and the treatment of age-related disease.

Cancer

- Cancer continues to be the second leading cause of death in the U.S., exceeded only by heart disease. One of every four deaths in the U.S. is from cancer. In 2002, an estimated 555,500 Americans will die of cancer – more than 1,500 people a day. One out of two American men and one out of three American women will be diagnosed with cancer, leading to over a million new cancer diagnoses this year: men (699,560) and women (668,470).
 - The most common cancer sites in both men (13%) and women (12%) are lung cancer; prostate cancer in men (33%); breast cancer in women (32%); colorectal cancer in men and women (11%).
 - “Age is the major risk factor for the majority of cancers, half of which become clinically evident in people over 70 years old.” (Ian S. Fentiman and Silvio Monfardini, *Cancer in the Elderly: Treatment and Research*, New York, Oxford University Press, 1994.) Seventy-seven percent of all cancers will be diagnosed in people over age 65. The risk of developing most cancers increases with age. The incidence rate for colorectal cancer is six times higher in persons over age 65 than it is for those between the ages
- for 40 and 64. More than 70 percent of all prostate cancers are diagnosed in men over age 65.
 - About one-third of the cancer deaths expected to occur this year will be related to nutrition, physical inactivity, overweight or obesity, and other lifestyle factors, and another third of cancer deaths in 2004 are expected to be caused by tobacco use, but individual genetics also play an important role in susceptibility to cancer-causing agents in the environment.
 - The National Institutes of Health (NIH) estimate overall costs for cancer in the year 2003 at \$189.5 billion. This includes \$64.2 billion for direct medical costs, \$16.3 billion for indirect morbidity costs (cost of lost productivity due to illness), and \$109 billion for indirect mortality costs (cost of lost productivity due to premature death).
 - The National Cancer Institute has identified 2015 as a date by which we hope to eliminate the suffering of and premature death due to cancer, and turn it into a manageable disease that people can live with. At the end of 2002, over 100 new cancer drugs were in Phase III clinical trials, with others on the way. There are also over 60 ongoing trials to help alleviate the suffering from such cancer-related side effects as cognitive dysfunction, fatigue, hot flashes, pain and nausea.
 - Developments in molecular biology, immunology and genetic research—specifically, genomics, proteomics, and pharmacogenomics—will lead to tremendous advances in cancer prevention, diagnosis, and treatment, particularly regarding issues such as drug resistance. Additionally, technologies like high-speed nuclear magnetic resonance spectroscopy and functional imaging provide new targets for disease interventions and drug design.

Cardiovascular Diseases

- Cardiovascular diseases (CVD) including heart attack and stroke remain the country's No. 1 killer of men and women, causing nearly 40% of all deaths in the US. Each year more than 930,000 Americans die from cardiovascular diseases, equating to nearly 2,600 deaths every day. One in five Americans suffer from CVD at a projected cost in 2004 of \$368 billion in medical expenses and lost productivity. Cardiovascular diseases cost Americans more than any other disease.
- Cardiovascular disease deaths rise significantly with age – as does the number of Americans suffering from these diseases. CVD remains a main cause of disability and the leading cause of death of older Americans. Of the Americans who die from CVD, more than 80% of them are age 65 and older.
- In 1999, 23% of nursing home residents' age 65 and older had a primary diagnosis of cardiovascular diseases at admission – the highest disease category of the residents. Cardiovascular diseases remain the largest cause of hospitalization for Americans age 65 and older.
- Approximately one in every four Americans has high blood pressure which, if not properly diagnosed and treated, can lead to heart failure, heart attack, stroke, or kidney failure. Recent NIH-supported Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial, the largest clinical trials designed to study drug treatments for high blood pressure, revealed that low-cost diuretics are as effective as more expensive pharmaceutical treatments in lowering blood pressure and preventing related complications.
- Perhaps the most effective measures for preventing cardiovascular disease are behavioral and relate to diet and exercise. The National Heart Lung and Blood Institute make several recommendations on diet, including the DASH and TLC plans, which can be found at <http://www.nhlbi.nih.gov>.
- Additional recent research has shown that high-normal blood pressure increases the risk of developing cardiovascular diseases, especially for people aged 65 years and older, who often have other risk factors such as high blood cholesterol and diabetes. Lifestyle changes (e.g., diet and exercise) are recommended as treatment.
- Other research has revealed how non-invasive magnetic resonance imaging (MRI) technology is drastically changing the diagnosis of heart attacks by allowing for detection in the emergency room that is faster and more accurate than standard measures. Use of MRI will save lives and reduce disability among survivors by allowing for quick diagnosis and the start of appropriate treatment.
- Past research has also identified atrial fibrillation, a common heart rhythm and rate disorder affecting more than 2 million Americans that is becoming increasingly prevalent, especially among the elderly, as a key risk factor for stroke. A clinical trial found that the preferred and most frequently used initial treatment for atrial fibrillation—restoration and maintenance of heart rhythm—prevents death no better than the alternative, often secondary, treatment of merely controlling the heart rate. Also, the heart rhythm strategy does not lower stroke risk, enhance quality of life, or improve cognitive function and may increase hospitalizations and adverse drug effects. These findings will radically change the way of preventing atrial fibrillation complications in many patients.

Dental and Oral Disease

- Oral health problems that result from dental cavities, periodontal (gum) disease, missing teeth, dentures that do not fit properly, or other oral infections can cause difficulty in eating, affect an elderly person's quality of life and may compromise compliance with therapy for other health conditions.
- While more Americans are keeping their natural teeth well into their elder years, according to the 2000 Surgeon General's report "Oral Health in America," 23% of 65-74 year olds have severe periodontal (gum) disease. About 30 percent of adults 65 and over are edentulous (without any teeth) – down from 46% in the 1980s. However, low-income individuals and minorities suffer disproportionately from oral disease and are at increased risk of tooth loss.
- Oral disease can seriously compromise the general health of individuals who have vulnerable immune systems. Elderly persons who need surgery can be at increased risk for infection from bacteria from untreated oral disease.
- Many elderly take multiple prescriptions and over-the-counter medications because of chronic disease. A side effect of many of these medications is xerostomia (dry mouth). This condition is a result of reduced salivary flow and can cause chewing and swallowing problems that may lead to poor nutrition. Xerostomia is associated with various other oral problems such as trouble speaking, inability to wear dentures, and increased dental cavities and periodontal diseases. It is estimated that about one-third of community-dwelling older adults may have xerostomia; however, dry mouth

is of particular concern for elderly in long-term care facilities who are prescribed an average of eight drugs at any one time. With more seniors now entering nursing homes with many of their natural teeth, xerostomia will require additional attention.

- The incidence of oral and pharyngeal cancer increases with age. According to data from the National Institutes of Health, persons 65 years of age and older are seven times more likely to be diagnosed with oral cancer than those who are younger. About half of those diagnosed with oral cancer die within 5 years. Since this cancer affects the oral soft tissues, routine annual examinations (including an oral cancer examination) can detect this disease in an early stage. It is recommended that all individuals (with and without natural teeth) see their dentist at least once a year, for a comprehensive oral examination.
- Research supported by the National Institute of Dental and Craniofacial Research continues to show associations between oral disease and systemic diseases. For example, periodontal disease and other mouth infections may be linked with such diseases as diabetes, heart disease, stroke and respiratory infection – all of which are common in the elderly. Additional research in this area may give us the answers necessary to help prevent or reduce the impact of these diseases by preventing oral disease.



Diabetes

- Diabetes is the sixth leading cause of death by disease in the U.S. and a leading cause of heart disease and stroke. It is also the leading cause of blindness, kidney disease, and non-traumatic nerve damage and lower limb amputation.
- 20 million Americans are additionally estimated to have pre-diabetes, a condition in which blood glucose levels are abnormally high, but not yet enough to be considered type 2 diabetes. Of these 20 million, 50% will develop type-2 diabetes within the next 5-10 years.
- About half of all diabetes cases are in people over age 55, and each year, over 210,000 deaths are attributable to diabetes and its complications.
- The cost of diabetes to the nation — including both direct and indirect costs— is over \$132 billion annually, according to the American Diabetes Association. The direct health care costs for a person living with diabetes are approximately \$13,200 annually.
- According to the Centers for Disease Control and Prevention, diabetes is a “chronic disease epidemic.” The prevalence of diabetes among US adults increased from 4.9% in 1990 to 7.9% in 2001 - an increase of more than 60%.
- Specifically for diabetes, the full impact of the continuing increase in obesity will be manifested in future years because of the substantial delay between the onset of obesity and the subsequent diagnosis of diabetes.
- Since 1980, the portion of the NIH budget devoted to diabetes has fallen by more than 20%, while the death rate due to diabetes has increased by

nearly 40%. Additionally, from 1987-1997, funding increases for diabetes at the NIH lagged far behind the overall average. Had diabetes merely kept up with the NIH average, nearly \$1 billion more would have gone to finding a cure for diabetes during the decade.

- A recent study conducted by the NIH-supported Diabetes Prevention Program so clearly demonstrated that lifestyle interventions reduced the chance of an individual's developing diabetes (by over 58 percent) that the trials ended a year early.

Aging With A Disability

- Older persons with disabilities are more likely to develop secondary conditions or have them worsen. Secondary conditions occur because of the presence of the primary disability and may include continuous pain, excessive fatigue, changes in skills or physical conditions, fractures from falls or pressure sores from continuous use of a wheelchair.
- Aging with conditions such as chronic pain is both expected and accepted as the norm by both older patients and doctors alike. Because of this erroneous belief, very few preventive measures are practiced and problems are allowed to compound. Patient and doctor education will continue to be necessary to successfully control secondary conditions of disability.
- An immediate need exists to define and establish a national policy on aiding successful aging among persons with disabilities associated with atypical adult development and aging.
- Advances in medical research, technology and delivery have dramatically

lengthened the average life span of persons with developmental, physical and mental disabilities. Yet we need additional knowledge about the aging process and its interactions with both age-related diseases and pre-existing impairments associated with aging with a disability.

- Scientists supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases have demonstrated that disease-modifying antirheumatic drugs and newer treatment strategies have greatly eased long-term disability among older patients with rheumatoid arthritis.

Epilepsy And Aging

- A 2000 study supported by the Epilepsy Foundation estimates that the cost of epilepsy in the United States is \$12.5 billion. It also found that the lifetime cost of the 181,000 new cases of seizures and epilepsy that develop each year is \$11.1 billion.
- Seizures are the third most frequently encountered neurological problem in the elderly population. The incidence of acute seizures in individuals over 60 is 50,000 new cases annually. Epilepsy – recurring seizures – affects 2.5 million Americans and today occurs more often in people over 60 than in any other age group.
- The risk for epilepsy increases 30% for each decade after age 20. Individuals aged 70 have a 4-fold risk of developing epilepsy based on aging alone.
- The leading cause of new cases of epilepsy in the elderly is stroke.

- Common causes among those developing epilepsy after age 65 are cerebrovascular disease, degenerative disorders such as Alzheimer's, and brain tumors.
- Seizures in the elderly lead to loss of driving privileges, independence, and self-confidence, and an increase in dependence, depression, and social isolation.
- Fractures occur 2 to 3 times as often in people with epilepsy as in the general population. Seizure-related falls in the elderly often are one-way tickets to an assisted living facility. Ten percent of the nursing home population is on anti-seizure medications.
- A scientific conference convened by the National Institute of Neurological Disorders and Stroke in 2000 established a series of benchmarks for epilepsy research, with the overarching goals of 1) understanding the underlying mechanisms by which epilepsy develops, 2) creating and implementing new therapies aimed at preventing epilepsy in individuals at risk, and 3) creating and implementing new therapies for patients with epilepsy that will prevent seizures without producing side effects.

Eye Disease

- An estimated 3.4 million Americans age 40 and older are visually impaired, including those who are blind. Approximately 10 million people in the U.S. are visually impaired, including those that are blind. More than 700,000 people over age 65 are legally blind, increasing each year by 25,000; more than 50% of new cases of blindness occur in this age group.

- More than 80 million Americans are at risk of developing potentially blinding eye diseases. Visual impairment is one of the 10 most frequent causes of disability in the U.S. The four leading causes of blindness in older Americans are macular degeneration, cataracts, glaucoma and diabetic retinopathy. Additionally, age-related macular degeneration is one of the top three causes of the loss of independence among the elderly.
- The U.S. spends \$3.4 billion each year in Medicare costs alone on cataract operations. If cataract development could be delayed by 10 years, approximately 50% of cataract operations would be avoided and \$2.5 billion could be saved annually. Ongoing research into the normal healthy functioning of the eye's lens may lead to a better understanding of the cause of cataracts and how they can be prevented.
- Preliminary, NIH-supported clinical trials have found that an experimental treatment for uveitis, a condition that accounts for an estimated 10-15 percent of blindness in the United States in which tissues in the eye become inflamed, has fewer side effects than traditional methods of treatment

- Current research opportunities include genetic research into inherited disorders of the retina, additional clinical trials to measure the effect of nutritional supplements in preventing or slowing the progression of age-related macular degeneration, and research concerning the transplantation of cells in the retina and the regeneration of the optic nerve.



Geriatric Training

- It is estimated that the U.S. currently needs 20,000 physicians-geriatricians to care adequately for our population of 35 million older people. Yet of the 650,000-licensed physicians practicing in the U.S., fewer than 9,000 physicians have met the qualifying criteria in geriatrics. Furthermore, this number is projected to decrease to as few as 6,100 by 2004. The U.S. will fall short of the 36,000 geriatricians needed by 2030 unless effective steps are taken to train new geriatric providers.
- The U.S. will need 2,400 geriatric academicians to train the needed providers with geriatric specialties, integrate geriatrics into medical practice, and develop standards of care for older people. Currently, there are fewer than 600 academic geriatricians in the U.S., and only a handful of medical schools require students to take any geriatric courses.
- There is also a lack of geriatric training among pharmacists, nurses, physician assistants, and other members of the health care field. Of the nation's 2,000 pharmacists, a mere 720 have geriatric certifications, despite the fact that most over-the-counter drug consumers are over the age of 65. Of today's 2.7 million registered nurses, less than 1% are certified in gerontology and only 3% of advanced practice nurses have specialized training in this area.
- The ongoing, NIH-supported Geriatric Academic Program is intended to support academic career development programs for junior faculty in geriatrics. However, the changing health care needs of the nation warrants a greater investment of resources in geriatric training for medical professionals.

Hearing Loss

- Hearing loss is one of the most common disabling conditions that an older person can suffer. By age 65, nearly one in three Americans will suffer from hearing loss, and by age 75, approximately half of all Americans will have some type of hearing impairment.
- As they grow older, some individuals experience a gradual loss of hearing, known as presbycusis. This does not mean, however, that hearing loss is a part of the natural aging process.
- Despite the fact that nearly 50% of people over the age of 75 have a hearing loss, studies show that up to three-quarters of hearing loss in the average American is due to the cumulative effects of toxic noise in the workplace.
- Each year, the total income lost as a result of deafness is approximately \$2.5 billion.
- Recent research suggests a relationship between hearing impairment and psychosocial health. Sensorineural hearing loss tends to bring about higher incidence of depression, withdrawal, and isolation (Crandell, Kricos, and King).
- Research at the National Institute on Deafness and Other Communication Disorders is now in progress to explore a chemical depletion thought to occur in the neurotransmitters in the brain related to hearing, helping to delay the onset of age-related hearing loss. Further research funded by private organizations, such as the Deafness Research Foundation, may provide answers to the issues of individual susceptibility, treatment and prevention of age-related hearing loss.

Incontinence

- Urinary incontinence (UI), the physical inability to control urination, afflicts as many as 25 million Americans. It is estimated that 16 million women suffer from stress urinary incontinence in the United States.
- Over their lifetime, women with stress urinary incontinence (SUI) spend an average of \$58,000 on treatment and management.
- Consumer research reveals that 15% of people who suffer from sudden urges to urinate do not "make it to the bathroom in time." Weekly or more frequent urge incontinence has been clinically associated with an increase risk of falls and fractures in older women.
- Urinary incontinence is among the top three reasons that individuals are transitioned to a nursing home.
- Recommendations from the International Conference on Urinary Incontinence specifically among the elderly strongly suggested that more funding should be made available for research into the causes and consequences of incontinence, as well as the benefits of preventive measures. Additionally, the Conference recommended that incontinence must be included as an independent problem in the International Classification of Diseases and that more primary care providers should be trained to address incontinence in their clinical practices, due to the increasing numbers of elderly people that live with the condition.
- The NIH established the Urinary Incontinence Treatment Network in 1999 which created a collaboration of investigators to conduct long-term

studies and clinical trials of the most commonly used surgical, pharmacological, and behavioral methods of treatment to manage urinary incontinence. The group concluded that urinary incontinence is a significant health care burden for the entire U.S. population and a major burden for the adult female population.

Infectious Diseases

- Pneumonia and influenza together are the seventh leading cause of death in persons between 65 and 74, the fifth leading cause of death in those between 75 and 84, and the fourth leading cause of death in those over age 85. For every 10,000 persons over 65 who receive the pneumococcal vaccine, an estimated saving of \$1.4 million to the health-care system could be realized.
- Each year, as many as 50,000 to 70,000 adult deaths occur from influenza, pneumococcal infections and hepatitis B-related disease, even though vaccines are available for all of these diseases. An average of 36,000 excess deaths occurs yearly from influenza and influenza-related pneumonia alone — 85% of them in people aged 65 or older. The direct medical costs of influenza alone are estimated at \$4.6 billion each year.
- Major technological developments underway include new formulation strategies (the application of controlled-release delivery systems to vaccines) which would eliminate the need for multiple doses of a vaccine, new vector systems for delivering vaccine antigens into cells, new antigens which are more immunogenic yet have improved safety profiles, adjuvants for potentiating immunity

and DNA vaccines (e.g. influenza). The impact of these technologies would be a significant decrease in the number of needle sticks, physician appointments and disease.

- Education efforts on the importance of flu shots and other preventive measures must continue. The Center for Disease Control's recommendations for flu shots can be found at www.cdc.gov/nip.

Medication Misuse

- Every year in the United States, it is estimated that 218,000 fatal adverse drug reactions occur annually. If classified as a distinct disease, it would rank as the fifth leading cause of death in the United States.
- The cost of medication-related problems in all age groups approaches \$177 billion annually.
- Older Americans face the greatest risk from medication misuse. The average older person uses 4.5 prescription medications concurrently. The percentage of hospitalizations of older patients due to adverse reactions to medication is said to be 17%, six times greater than the general population.
- Current research is being conducted to examine the prevention of adverse drug reactions (ADR) in people 65 and older. This research will identify patient and healthcare provider factors associated with occurrence of ADR's, as well as the underlying clinical causes and systems failures that lead to their occurrences.

Mental Health

- Depression is a serious illness affecting approximately 15 out of every 100 adults over age 65 in the U.S. The disorder affects a much higher percentage of people in hospitals and nursing homes. Epidemiological studies over the past 10 years have consistently shown that two-thirds of older Americans in nursing homes suffer from mental disorders including Alzheimer's and related dementia.
- Untreated, depression can lead to disability, worsen symptoms of other illnesses, lead to premature death and result in suicide. The suicide rate for those over 65 is higher than for any other age group and the suicide rate for those 85 and older is nearly twice the overall national rate.
- Of the 32 million older Americans, about 4 million suffer from dementing disorders, about 5 million suffer from serious and persistent symptoms of depression, and another million suffer from major depressive disorder.
- NIA-funded research is beginning to show the types of factors that can slow or mitigate mild cognitive impairment, a precursor condition to dementia.
- Recent research supported by the National Institute on Mental Health has shown that elderly suicide is strongly associated with late onset unipolar depression, which is a treatable disorder. Although a majority (over 70%) of elderly suicide victims have seen their primary care physician within one month of their suicide, they typically are not treated or referred for treatment of their depression.
- In another NIH-supported study, suicidal thoughts among elderly patients decreased by 70 percent, revealing that educating physicians, social workers

and nursing staff, and bringing treatment and intervention guidelines up to standard, can significantly improve an older patient's mental health.

Osteoporosis

- Osteoporosis and low bone mass are currently estimated to be a major public health threat for almost 44 million U.S. women and men aged 50 and older. This represents 55% of people aged 50 and older in the United States. The direct medical costs of osteoporosis are estimated to be \$17 billion per year (2001 dollars).
- Nearly all fractures in older adults are the result of low bone mass. Estimates indicate there are at least 1.5 million fractures each year – 300,000 hip fractures, 700,000 fractures of the spine, 250,000 distal forearm fractures and 300,000 fractures at other sites. Twenty-four percent of fracture victims age 50 and older die in the year following the fracture; twenty-five percent of those patients who were ambulatory before they had the fracture require long term care afterwards.
- The osteoporosis research effort has only just begun. Scientists are on the brink of many breakthroughs that will require a greatly increased medical research effort and additional funding. Medical experts agree that osteoporosis is largely preventable and treatable.
- NIH-supported research funding on osteoporosis will exceed \$221 million in FY 2004. However, scientists to date have been unable to unlock the key to bringing osteoporosis under control and/or finding a cure. Research is needed to isolate genes that may help identify individuals at high risk for osteoporosis, to understand how to stimulate osteoblast

activity — the bone building cells— in order to replace lost bone, to learn more about osteoporosis in men and minority populations, and to understand how children, adolescents and young adults can achieve adequate peak bone mass.

Paget's Disease Of Bone

- Paget's disease of bone, a condition which affects middle-aged and older people, is the second most prevalent bone disease after osteoporosis. Paget's disease affects 1.5-8% of the population, depending on a person's age and where he/she lives.
- When severe, Paget's disease can be extremely painful and can cause significant deformity and complications including hearing loss, bowing of the limbs, neurological complications, and arthritis.
- More research is needed to further study the genetics of Paget's disease, to further investigate osteosarcoma and Paget's disease, and to study optimal treatment.

Parkinson's Disease

- Parkinson's disease is a degenerative neurological disorder that affects more than one million Americans, causing disabling tremors, stiffness, slowness of movement, balance impairment and dementia, ultimately leaving sufferers incapable of caring for themselves. A new case of Parkinson's disease is diagnosed every nine minutes, equating to 60,000 people each year. No cure exists.

- In addition to causing enormous pain and suffering for those afflicted with this disorder, Parkinson's places a tremendous strain on families and costs our society more than \$25 billion annually, a figure which continues to grow.
- Suspected genetic and environmental links to the cause of the disease can carry important implications for other degenerative disorders. New techniques using neural growth factors, stem cells, genetic engineering, and tissue transplants carry major potential for treatment. However, further extensive research is needed to develop and apply these approaches to patients.
- Research initiatives supported by the National Institute of Neurological Disorders and Stroke (NINDS) on therapeutic uses of neuroprotectants for the treatment of Parkinson's have gone to clinical trials for use in humans. Further studies conducted by the National Center for Complementary and Alternative Medicine (NCCAM) are underway to determine the neuroprotective qualities of diets rich in foods that possess B vitamins and antioxidant phytochemicals, such as blueberries. These nutrients have been shown to forestall and possibly reverse some of the neurological changes associated with age-related neurodegenerative conditions like Parkinson's disease.
- NIA has also invested significant research efforts into exploring the role that genes, including alpha-synuclein, Tau, Parkin, as well as protein aggregation, play in the development and onset of the disease. This NIH-supported research, along with the work of several other NIH institutes, will prove to be invaluable in the development of improved methods of diagnosis and treatment of Parkinson's disease.

Social And Behavioral Adjustment To Aging

- Social and behavioral research is a proven critical component in reducing illness and frailty among older people. The knowledge produced is often relevant to all diseases and disorders. Individual behaviors such as diet, exercise and adherence to regimens, as well as social factors such as racial oppression, family and community support and economic determinants, can affect the ability to maintain health throughout life.
- Older rural populations are more likely to suffer from chronic or serious illnesses than their urban counterparts, and to be without regular sources of health care and health insurance. Research to promote health and prevent disease among the elderly needs to be fully funded.
- Health disparities in minority populations continue to exist. Additional research on interventions that increases the understanding of aging in older minority populations is needed.
- Studies suggest that disability rates of older Americans are declining, with that decline accelerating in recent years. Demographic research is needed to identify and quantify the specific underlying causes of this decline. Research that tracks this decline is needed, especially its health, disability and life expectancy implications for national policies, particularly those policies pertaining to retirement and other programs designed for the elderly.
- Research on cognitive function is one of the most dynamic areas of discovery in aging research. The ability of

an individual to think, remember, perceive and be attentive can be improved with behavioral interventions, as discovered recently in laboratory studies. Field tests to determine which interventions can be most useful in improving individual functioning are needed to help older Americans lead productive and independent lives.

- Additional funding is needed to conduct follow-up meetings and research in the wake of ACTIV clinical trials, a study that demonstrated that, while specific interventions have been shown to improve specific types of cognitive tasks, the effect of the interventions does not generalize to improve overall cognitive functioning.
- NIA hopes to expand its behavioral genetics research program. Genetic studies—longitudinal twin studies, for example—can shed light on environmental factors that contribute to health or illness of older adults.

Stroke

- Stroke, America's third most common cause of death, a leading cause of adult disability and a major contributor to late-life dementia, will cost this nation an estimated \$54 billion in health care and lost productivity in 2004.
- Stroke strikes about 700,000 Americans each year killing nearly 164,000 and disabling 15 to 30 percent of the survivors. 88% of those who die from stroke are age 65 years and older. For people over 55 years of age, the incidence of stroke more than doubles in each successive decade.
- Studies by the National Institute of Neurological Disorders and Stroke (NINDS) have shown that if t-PA, a treatment for blood clots in stroke

patients, is administered in a hospital setting within three hours of the onset of stroke symptoms, there is a 33% increase in the number of patients who are free of disability three months post-stroke. The findings resulted in FDA approval for t-PA. By improving the outcome for stroke victims, use of t-PA will save health care costs by reducing the need for rehabilitative services and long-term care for stroke survivors.

- In order to raise awareness of stroke symptoms and to the fact that stroke is a medical emergency, the NINDS has launched a major public education effort, along with other members of the Brain Attack Coalition, using TV, radio, print media, brochures and display ads.
- Results of two clinical trials showed that aspirin was just as effective in preventing recurrent strokes as expensive drugs. These results will dramatically change physician care in preventing second strokes in both the general public and African Americans, the population at greatest risk for stroke. Given the lower cost, the ease of administration and reduced side effects, compared to more expensive treatments such as warfarin and ticlopidine, aspirin will be a cost-effective method in preventing subsequent strokes.

Veterans

- As of the year 2000, two-thirds of all men age 65 and over were veterans. In response to the growing aging veteran population, the Department of Veterans Affairs (VA) has established a variety of institutional and non-institutional programs for meeting the healthcare needs of older patients. The VA also takes a leadership role in the field of geriatrics through the

establishment of Geriatric Research, Education and Clinical Centers (GRECCs), which are located at sixteen VA Medical Centers.

- The VA Research Program has developed many procedures and devices that are in routine medical practice, including the cardiac pacemaker and the nuclear-powered pacemaker, radio-immune assay techniques, the smart wheelchair, the first robotic limbs and the laser cane for the blind.
- Future research efforts should emphasize trauma, especially the effects of trauma over time and diseases of the brain and spinal cord, with a particular emphasis on the impact of such diseases in older patients and the aging process and malignancies.

Women's Health

- Women's health includes all diseases and conditions that affect women solely, predominantly, differently, or disproportionately.
- Women have a longer life expectancy than men. Older women comprise 59% of the 65 and over population, and about three-fourths of the population over age 85, but they also suffer disproportionately from more cardiovascular disease, mental disorders, osteoporosis, disability, autoimmune disease, stroke and incontinence.
- The physiological and psychological consequences of caregiving must be examined and recognized as predominantly a woman's health issue.
- Cardiovascular disease is the number one killer of women, and lung cancer is the greatest cancer killer of women, with more deaths than breast cancer since 1987.

- The NIH-sponsored, congressionally mandated Women's Health Initiative (WHI) is a 14-year research effort, following over 160,000 women nationwide between the ages of 50 and 80. This study tests strategies to prevent cardiovascular diseases and stroke, breast cancer, colorectal cancer and osteoporosis by evaluating effects of dietary modification, hormone replacement therapy, vitamin supplementation and overall healthy behaviors and practices. Though the WHI study that tested hormone therapy has now ended, research on dietary intervention and a calcium plus vitamin D intervention continues. Follow-up research using this cohort of women and additional research on similar populations will further our understanding of how to best prevent and treat the most common causes of death and disability in older women.

- Because of the controversy that surrounds the results of the WHI trials that relate to hormone therapy, the National Institutes of Health, FDA, and several of the major medical societies have developed guidelines that offer a roadmap for health care professionals and their patients to help in the decision making. Extended use of estrogen or estrogen/progestin therapy is acceptable under some circumstances to treat the symptoms of menopause, provided the woman is well aware of the risks and there is strict medical supervision, but ultimately, estrogen therapy should not be used for primary or secondary prevention of osteoporosis, coronary heart disease or stroke. Detailed recommendations on the use of estrogen therapy can be found on the FDA website at <http://www.fda.gov/womens/menopause/default.htm> and on the NIH website at http://www.nhlbi.nih.gov/health/women/pht_facts.htm.

- Autoimmunity—in which the immune system attacks the body's own cells

and tissues—is the leading cause of chronic illness that continues to affect women as they age. The National Institutes of Health's Office of Research on Women's Health recently recognized autoimmunity as a major woman's health issue. Approximately 75% of people with autoimmune conditions such as autoimmune-related thyroid disease are women.

- A recent Institute of Medicine (IOM) report on sex and gender differences concluded that progress in women's health and inclusion of women in research will be of little value unless the "underlying implications—that is, the actual differences between males and females that make such research so critical—are systematically studied and elucidated." The report also called for increased interdisciplinary research in the field of women's health. Improving multidisciplinary knowledge about gender-based disparities between the sexes will ultimately benefit and improve the health of both women and men.

"NIH must lead the way in instituting the changes in medical research necessary to improve the health of all Americans. It is clear that NIH has a compelling vision for the future of medical research and what will have the most profound impact on research and most importantly the health of all Americans."

HHS Secretary, Tommy G. Thompson

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