

Summary

People forget things—a name, where they put their keys, a phone number—and yet what is dismissed as a minor inconvenience at 25 years of age, can evolve into a momentary anxiety at 35, and a major source of personal worry at ages 55 or 60. Forgetfulness at older ages is often equated with a decline in cognition—a public health issue that goes beyond memory lapses and one that can have significant impacts on independent living and healthy aging. The term “cognition” covers many mental abilities and processes including decision making, memory, attention, and problem-solving. Collectively, these different domains of cognition are critical for successfully engaging in the various activities involved in daily functioning such as paying household bills, following a recipe to cook a meal, and driving to a doctor’s appointment. As human life expectancy increases, maintaining one’s cognitive abilities is key to assuring the quality of those added years.

Cognitive aging is a public health concern from many perspectives. Individuals are deeply concerned about declines in memory and decision-making abilities as they age and may also be worried about whether these declines are early signs of a neurodegenerative disease, particularly Alzheimer’s disease. They may fear that cognitive decline will lead to a loss of independence and a reduced quality of life and health. In a 2012 survey of its members, AARP found that staying “mentally sharp” was a top concern of 87 percent of respondents. Cognitive decline affects not only the individual, but also his or her family and community, and an array of health, public health, social, and other services may be required to provide necessary assistance and support. Lost independence may stem from impaired decision making, which can reduce an individual’s ability to drive or increase the individual’s vulnerability to financial abuse or ex-

ploitation. Cognitive impairment also affects society and the public's quality of life.

At this point in time, when the older population is rapidly growing in the United States and across the globe, it is important to carefully examine what is known about cognitive aging, to identify the positive steps that can be taken to maintain and improve cognitive health, and then to take action to implement those changes by informing and activating the public, the health sector, nonprofit and professional associations, the private sector, and government agencies. In the past several decades rapid gains have been made in understanding the non-disease changes in cognitive function that may occur with aging and in elucidating the range of cognitive changes, from those that are normal with aging to those that are the result of disease; much remains to be learned yet the science is readily advancing.

This Institute of Medicine (IOM) study examines cognitive aging, a natural process associated with advancing years. The IOM committee was charged with assessing the public health dimensions of cognitive aging with an emphasis on definitions and terminology, epidemiology and surveillance, prevention and intervention, education of health professionals, and public awareness and education.

WHAT IS COGNITIVE AGING?

This report focuses on one aspect of health in older adults—cognitive health. Cognition refers to the mental functions involved in attention, thinking, understanding, learning, remembering, solving problems, and making decisions. It is a fundamental aspect of an individual's ability to engage in activities, accomplish goals, and successfully negotiate the world. Although cognition is sometimes equated with memory, cognition is multidimensional because it involves a number of interrelated abilities that depend on brain anatomy and physiology. Distinguishing among these component abilities is important since they play different roles in the processing of information and behavior and are differentially impacted by aging.

The committee provides a conceptual definition of cognitive aging as a process of gradual, ongoing, yet highly variable changes in cognitive functions that occur as people get older. Cognitive aging is a lifelong process. It is not a disease or a quantifiable level of function. However, for the purposes of this report the focus is primarily on later life. In the

PREPUBLICATION COPY: UNCORRECTED PROOFS

context of aging, cognitive health is exemplified by an individual who maintains his or her optimal cognitive function with age.

Box S-1 provides the committee's characterization of cognitive aging. Cognitive aging is too complex and nuanced to define succinctly, and therefore it is appropriately characterized through this longer description. Efforts are needed to develop operational definitions of cognitive aging in order to allow comparisons across studies.

BOX S-1
Characterizing Cognitive Aging

- **Key Features:**
 - Inherent in humans and animals as they age.
 - Occurs across the spectrum of individuals as they age regardless of initial cognitive function.
 - Highly dynamic process with variability within and between individuals.
 - Includes some cognitive domains that may not change, may decline, or may actually improve with aging, and there is the potential for older adults to strengthen some cognitive abilities.
 - Only now beginning to be understood biologically, yet clearly involves structural and functional brain changes.
 - Not a clinically defined neurological or psychiatric disease such as Alzheimer's disease and does not inevitably lead to neuronal death and neurodegenerative dementia (such as Alzheimer's disease).
- **Risk and Protective Factors:**
 - Health and environmental factors over the life span influence cognitive aging.
 - Modifiable and non-modifiable factors include genetics, culture, education, medical comorbidities, acute illness, physical activity, and other health behaviors.
 - Cognitive aging can be influenced by development beginning in utero, infancy, and childhood.
- **Assessment:**
 - Cognitive aging is not easily defined by a clear thresholds on cognitive tests since many factors—including culture, occupation, education, environmental context, and health variables (e.g., medications, delirium)—influence test performance and norms.

PREPUBLICATION COPY: UNCORRECTED PROOF

- For an individual, cognitive performance is best assessed at several points in time.
- **Impact on Daily Life:**
 - Day-to-day functions, such as driving, making financial and health care decisions, and understanding instructions given by health care professionals, may be affected.
 - Experience, expertise, and environmental support aids (e.g., lists) can help compensate for declines in cognition.
 - The challenges of cognitive aging may be more apparent in environments that require individuals to engage in highly technical and fast-paced or timed tasks, in situations that involve new learning, and in stressful situations (i.e., emotional, physical, or health-related), and may be less apparent in highly familiar situations.

CHARACTERIZING AND ASSESSING COGNITIVE AGING

Age-related changes in cognition are highly variable from one individual to the next. This variability is explained in part by differences in life experience, health status, lifestyle, education, attitudinal and emotional factors, socioeconomic status, and genetics. The trajectory of cognitive change also varies for different cognitive functions—memory, decision making, learning, speed of processing, and so on. Further, older age is not associated only with decline; some aspects of cognition, such as wisdom, remain stable in the older decades and aspects of intelligence, such as knowledge, may actually increase with age until the very later decades.

A wide variety of tools and measures are available to test for cognitive change; however, not all may be relevant to real-world activities. Studies use different methods, measures, and definitions that make comparison difficult, and the cognitive aging literature has some significant gaps. Studies of brain tissue in both humans and in animal models have sought to examine the underlying neural mechanisms that may be responsible for age-related changes in cognition. These include studies of neuronal number, synaptic integrity, and neurotransmitters. Overall, they show that neuronal number remains relatively stable, although changes do occur in neuronal structure and neurotransmitter receptors. (The sta-

bility in the number of neurons—that is, the lack of neuron death—is in contrast to the extensive neuron loss seen in Alzheimer’s disease.)

Recommendation 1: Increase Research and Tools for Assessing Cognitive Aging and Cognitive Trajectories

National Institutes of Health, Centers for Disease Control and Prevention, research foundations, academic research institutions, and private-sector companies should expand research on the trajectories of cognitive aging and improve the tools used to assess cognitive changes and its effects on daily function.

Specific needs include

- Studies using a range of assessments (e. g. , neuronal injury biomarkers, neuroimaging, postmortem assessments of neuronal integrity) to explore the physiological and structural basis of cognitive aging;
- Nonhuman animal studies that examine the mechanisms and clinical correlates of cognitive aging and that are designed to inform human cognitive aging;
- Studies to examine the mechanisms underlying interventions that affect the cognitive trajectory;
- Studies to identify and validate novel tools and measures of function that capture the complexities of real-world tasks and are sensitive to early changes in cognition and function; and
- An update of the norms for cognitive function in older adults (including those in the most advanced age groups) to include the consideration of disease, literacy, language, racial and ethnic diversity, culture, and socioeconomic factors.

UNDERSTANDING THE POPULATION IMPACT

While a great deal of research has examined the occurrence, causes, natural history, pathogenesis and clinical management of dementia, including Alzheimer’s disease, less attention has been paid to cognitive aging per se, particularly from a public health perspective. Population-based information about the nature and extent of cognitive aging provides a basis for building public awareness and understanding and can be

PREPUBLICATION COPY: UNCORRECTED PROOF

used to engage individuals and their families in maintaining cognitive health; to inform health care professionals, financial professionals, and others in how to advise their older patients and clients; and to guide program development and implementation.

Recommendation 2: Collect and Disseminate Population-Based Data on Cognitive Aging

The Centers for Disease Control and Prevention (CDC), state health agencies, and other relevant government agencies, as well as nonprofit organizations, research foundations, and academic research institutions should strengthen efforts to collect and disseminate population-based data on cognitive aging. These efforts should identify the nature and extent of cognitive aging throughout the population, including high-risk and underserved populations, with the goal of informing the general public and improving relevant policies, programs, and services.

Specifically, expanded cognitive aging data collection and dissemination effort should include

- A focus on the cognitive health of older adults as separate from dementia or other clinical neurodegenerative diseases.
- The development of operational definitions of cognitive aging for use in research and public health surveillance and also the development of a process for periodic reexamination. Analyses of existing longitudinal datasets of older persons should be used to inform these efforts.
- Expanded data collection efforts and further analyses of representative surveys involving geographically diverse and high-risk populations. These efforts should include cognitive testing when standardized, feasible, and clinically credible and also self-reports of perceptions or concerns regarding cognitive aging, personal and social adaptations, and self-care and other management practices.
- Longitudinal assessments of changes in cognitive performance and risk behaviors in diverse populations.
- Inclusion of cognition-related questions in the core instrument of the Behavioral Risk Factor Surveillance System, rather than an optional module.

- Exploration of other available relevant data on cognitive health such as health insurance claims data, sales and marketing data for cognition-related products and treatments, data on financial and banking transactions as well as on financial fraud and scams, and data on automobile insurance claims.
- Active dissemination of data on cognitive aging in the population. An annual or biennial report to the U.S. public should be issued by the CDC or other federal agency on the nature and extent of cognitive aging in the U.S. population.

REDUCING RISKS AND DEVELOPING INTERVENTIONS

The brain is subject to a lifetime of demands and exposures, both beneficial and deleterious. Given the importance to the public's health of preventing individuals' cognitive impairment and promoting their cognitive health, it is important to develop an in-depth understanding of these various beneficial and deleterious factors to guide prevention and remediation efforts. However, much remains to be learned about the relationship between lifestyle and risk factors and the maintenance of high levels of cognition throughout the adult life span. While many studies have examined dementia-based outcomes, few have examined early non-dementia related cognitive changes, which may be quite subtle. Most of the interventions developed to date focus on prevention, although researchers are exploring some remediation strategies. For products that claim to enhance cognitive function or to maintain current levels of function (including cognitive training products, nutraceuticals, supplements, or medications), a review of policies and regulatory guidance is needed. Although there is wide variability in cognitive function among individuals, a number of specific actions can be taken to maintain cognitive health and reduce the effects of cognitive aging.

Recommendation 3: Take Actions to Reduce Risks of Cognitive Decline with Aging

Individuals of all ages and their families should take actions to maintain and sustain their cognitive health, realizing that there is wide variability in cognitive health among individuals.

Specifically, individuals should:

PREPUBLICATION COPY: UNCORRECTED PROOF

- Be physically active.
- Reduce and manage cardiovascular disease risk factors (including hypertension, diabetes, smoking).
- Regularly discuss and review health conditions and medications that might influence cognitive health with a health care professional.
- Take additional actions that may promote cognitive health, including
 - Be socially and intellectually engaged, and engage in life-long learning;
 - Get adequate sleep and receive treatment for sleep disorders if needed;
 - Take steps to avoid the risk of cognitive changes due to delirium if hospitalized; and
 - Carefully evaluate products advertised to consumers to improve cognitive health, such as medications, nutritionals, and cognitive training.

Recommendation 4: Increase Research on Risk and Protective Factors and Interventions to Promote Cognitive Health and Prevent or Reduce Cognitive Decline

The National Institutes of Health, the Centers for Disease Control and Prevention, other relevant government agencies, non-profit organizations, and research foundations should expand research on risk and protective factors for cognitive aging and on interventions aimed at preventing or reducing cognitive decline and maintaining cognitive health.

Research efforts should:

- Develop collaborative approaches between ongoing longitudinal studies across the life span that focus on cognitive aging outcomes in order to maximize the amount and comparability of data available on risk and protective factors.
- Examine risk factors and interventions in under-studied and vulnerable populations including people 85 years and older and those with childhood or youth trauma or developmental delay, mental illness, learning disabilities, or genetic intellectual disabilities, and spanning ethnic/cultural and socioeconomic groups.

- Conduct single- and multi-component clinical trials of promising interventions to promote cognitive health and prevent cognitive decline, testing for both cognitive status and functional outcomes.
- Assess cognitive outcomes in clinical trials that target the reduction of cardiovascular and other risk factors likely related to cognitive health.
- Explore older adults' preferences and values regarding cognitive health and aging; and regarding specific cognitive interventions and training modalities.
- Identify effective approaches to sustaining behavior changes that promote healthy cognition across the life span.

Recommendation 5: Ensure Appropriate Review, Policies, and Guidelines for Products That Affect Cognitive Function or Assert Claims Regarding Cognitive Health

The Food and Drug Administration and the Federal Trade Commission, in conjunction with other relevant federal agencies and consumer organizations, should determine the appropriate regulatory review, policies, and guidelines for

- **over-the-counter medications (such as antihistamines, sedatives, and other medications that have strong anticholinergic activity) that may affect cognitive function, and**
- **interventions (such as cognitive training, nutraceuticals, supplements, or medications) that do not target a disease but may assert claims about cognitive enhancement or maintaining cognitive abilities such as memory or attention.**

IMPROVE HEALTH CARE PROFESSIONAL EDUCATION AND USE OF WELLNESS VISITS

As a result of the aging of the population, older adults are constituting an increasingly larger portion of the patients seen by health care professionals both in acute and ambulatory care settings. Moreover, with increased public awareness of and concern about cognitive impairment and dementia in older age, individuals and families are turning to health

PREPUBLICATION COPY: UNCORRECTED PROOF

care professionals for information and advice about brain health. Health care professionals are trusted sources of information on cognitive aging and need to be fully informed and ready to respond to patient queries. Further efforts are needed by health professional schools, continuing education organizations, and professional associations to establish and reinforce the core competencies needed to respond to patient and family concerns about cognitive aging as well to proactively recommend effective steps to maximize cognitive health. Further, attention needs to be paid to certain medications that may cause cognitive impairment as well as to delirium and associated cognitive decline that may occur in older adults during hospitalization and post-surgery recovery.

Recommendation 6: Develop and Implement Core Competencies and Curricula in Cognitive Aging for Health Professionals

The Department of Health and Human Services, the Department of Veterans Affairs, and educational, professional, and interdisciplinary associations and organizations involved in the health care of older adults (including, but not limited to, the Association of American Medical Colleges, the American Association of Colleges of Nursing, the National Association of Social Workers, the American Psychological Association, and the American Public Health Association) should develop and disseminate core competencies, curricula, and continuing education opportunities, including for primary care providers, that focus on cognitive aging as distinct from clinical cognitive syndromes and diseases, such as dementia.

Recommendation 7: Promote Cognitive Health in Wellness and Medical Visits

Public health agencies (including the Centers for Disease Control and Prevention and state health departments), health care systems (including the Veterans Health Administration), the Centers for Medicare & Medicaid Services, health insurance companies, health care professional schools and organizations, health care professionals, and individuals and their families should promote cognitive health in regular medical and wellness visits among people of all ages. Attention should also be given to cognitive outcomes during hospital stays and post-surgery.

Specifically, health care professionals should use patient visits to:

- identify risk factors for cognitive decline and recommend measures to minimize risk; and review patient medications, paying attention to medications known to have an impact on cognition;
- provide patients and families with information on cognitive aging (as distinct from dementia) and actions that they can take to maintain cognitive health and prevent cognitive decline; and
- encourage individuals and family members to discuss their concerns and questions regarding cognitive health.

In addition, other components of the health care system have a cognitive health promotion role:

- CMS should develop and implement demonstration projects to identify best practices for clinicians in assessing cognitive change and functional impairment and in providing appropriate counseling and prevention messages during, for example, the Medicare Annual Wellness Visit or other health care visits.
- Health care systems and private and public health insurance companies should develop evidence-based programs and materials on cognitive health across the life span.
- During and after hospital stays and post-surgery, health care providers, patients, and families should be alert to potential cognitive changes and delirium.

**COMMUNITY ACTIONS:
HEALTH, FINANCES, DRIVING, TECHNOLOGY, AND
CONSUMER DECISIONS**

The effects of cognitive aging can affect everyday life for older adults and their families. They can manifest themselves as decreased judgment regarding when to make a left turn while in a busy intersection, uncertainty whether a new financial investment is a wise choice or a fraudulent scam, or declining ability to take care of one's overall health.

PREPUBLICATION COPY: UNCORRECTED PROOF

Further, cognitive aging has significant impacts on society. In addition to significant financial losses (that older adults lose an estimated \$2.9 billion a year, directly and indirectly, to financial fraud), an array of health, public health, social, and other services may be required to provide necessary assistance and support. Improving the quality of life for older adults is a societal value that for cognitive aging has widespread consequences and requires action in many sectors.

Communities across the country have been working to improve independence, health, and quality of life for older adults. Efforts are under way in many areas, but challenges continue in knowing how best to help older adults identify and address the potential impact of cognitive aging.

Recommendation 8: Develop Consumer Product Evaluation Criteria and an Independent Information Gateway

Centers for Disease Control and Prevention, National Institutes of Health, and the Administration for Community Living, in conjunction with other health and consumer protection agencies, nonprofit organizations, and professional associations, should develop, test, and implement cognitive aging information resources and tools that can help individuals and families make more informed decisions regarding cognitive health.

Specifically,

- A central, user-friendly, easily navigated website should be available to provide independent, evidence-based information and links relevant to cognitive aging including information on the promotion of protective behaviors and links to effective programs and services. The information should be presented in a way that takes health literacy into account.
- Consumer-relevant criteria should be developed and widely disseminated to provide individuals and families with guidance on evaluating cognition-related products (e.g., cognitive training products, nutraceuticals, and medications).

Recommendation 9: Expand Services to Better Meet the Needs of Older Adults and Their Families with Respect to Cognitive Health

Relevant federal and state agencies (including the Administration for Community Living [ACL], the Centers for Disease Con-

trol and Prevention [CDC], the National Highway Traffic Safety Administration [NHTSA], and the Consumer Financial Protection Bureau), nonprofit organizations (such as the Financial Industry Regulatory Authority), professional associations, and relevant private sector companies and consumer organizations should develop, expand, implement, and evaluate programs and services used by older adults relevant to cognitive aging with the goal of helping older adults avoid exploitation, optimize their independence, improve their function in daily life, and aid their decision making.

Specifically,

- Financial decision making:
 - The banking and financial services industries and state and federal banking and financial regulators should develop and disseminate banking and financial policies, services, and information materials that assist older adults and their families in making decisions that meet their financial means and objectives, that reduce the opportunities for unsuitable decisions, and that mitigate the harms of such decisions.
 - Surrogacy mechanisms, such as powers of attorney or multi-party accounts should have appropriate safeguards to protect the interests of the older adult.
 - The financial services industries and relevant state and federal agencies should develop, strengthen, and implement systems approaches, best practices, training, and laws and regulations to help verify that financial transactions are not fraudulent or the result of diminished capacity or undue influence.
 - Systems should be strengthened for reporting or taking other protective actions against potential financial fraud, exploitation, or abuse to relevant enforcement and investigative officials. Laws and regulations should be revised to mitigate civil liability and professional harms resulting from such protective actions.
- Driving and transportation:
 - NHTSA, states' departments of motor vehicles, and relevant professional and consumer organizations such as the American Automobile Association

PREPUBLICATION COPY: UNCORRECTED PROOF

- should expand, validate, and disseminate tools and informational materials to assist older adults in maintaining and assessing their driving skills and to assist older adults and their families in making decisions about safe driving.
- The automobile industry should expand and evaluate technologies that enhance decision making and safety for older drivers.
 - State and local transportation authorities, local planning commissions, private developers, and community groups should expand efforts to develop and implement alternative transportation options to accommodate changes that occur with cognitive aging, including efforts to ensure safe and walkable communities
- Technology:
 - Technology industries should develop and adapt hardware, software, and emerging technologies to accommodate the needs of older adults that are related to cognitive aging.
 - CDC, ACL, and other relevant agencies, organizations, and private sector companies should support evidence-based programs that educate older adults in the use of emerging technologies.
 - Health information:
 - Health information providers, including private sector companies and government agencies, should ensure that their websites (including patient health portals), packaging (including medication packaging), and other consumer health information relevant to cognitive aging meet health literacy standards.

EXPAND PUBLIC EDUCATION AND ENGAGEMENT

Meeting the public health goal of maintaining cognitive health requires clear and effective communication featuring accurate, up-to-date, and consistent messages that resonate with individuals and their communities and encourage behavior that promotes cognitive health. Attention needs to be paid to whether different segments of population are exposed

PREPUBLICATION COPY: UNCORRECTED PROOFS

to relevant information, persuaded to act accordingly, and have the environmental supports in place to change and maintain behaviors that are supportive of cognitive health. Since new research findings are constantly becoming available, stakeholders also need a reliable means of keeping up with this rapidly changing field.

As noted throughout this report, cognitive aging is not synonymous with Alzheimer's disease. Major challenges for public information campaigns about cognitive aging are to differentiate the messages from those about Alzheimer's disease and other dementias and to promote actions to enhance or maintain cognitive health and to prevent or reduce cognitive decline.

Recommendation 10: Expand Public Communications Efforts and Promote Key Messages and Actions

Centers for Disease Control and Prevention, the Administration for Community Living, state and local government agencies, relevant nonprofit and advocacy organizations and foundations, professional societies, and private-sector companies should develop, evaluate, and communicate key evidenced-based messages about cognitive aging through social marketing and media campaigns; work to ensure accurate news and storylines about cognitive aging through media relations; and promote effective services related to cognitive health in order to increase public understanding about cognitive aging and support actions that people can do to maintain their cognitive health.

Public communications efforts should:

- Reach the diverse U.S. population with campaigns and programs targeted to all relevant groups,
- Be sensitive to existing differences in knowledge, literacy, health literacy, perceived risk, cognitive aging related behavior, communication practices, cultures and beliefs, speech and hearing declines, and skills and self-efficacy among target groups,
- Include evaluation components to assess outreach efficacy in the short- and long- term; and research the optimal communication strategies for the key messages among the target groups,
- Be updated as new evidence is gained on cognitive aging,
- Emphasize a lifelong approach to cognitive health,

PREPUBLICATION COPY: UNCORRECTED PROOF

- Promote succinct and actionable key messages, that are understandable, memorable, and relevant to the target groups,
- Focus on sustaining changes in behaviors that promote cognitive health, and
- Promote effective evidence-based tools for maintenance of cognitive health and cognitive change assessment, as well as the information gateway on cognitive aging (see Recommendation 8).

OPPORTUNITIES FOR ACTION

Aging is inevitable, but individuals, families, communities, and society can take actions that may help prevent or ameliorate the impact of aging on the brain, that can create greater understanding about its impact, and that can help older adults live fuller and more independent lives. One of the major concerns of older adults is “Will I stay sharp?” Although changes in cognitive function vary widely among individuals, there are a number of actions that would make a difference and promote cognitive health; these are summarized in Box S-2 and detailed throughout the discussion and recommendations in this report. Cognitive aging is not just an individual or family or health care system challenge—it is an issue that affects the fabric of society and that requires actions by many and varied stakeholders. How society responds to these challenges will reflect the value it places on older adults and how it views their continued involvement and contribution to their families, social networks, and communities.

The committee heard throughout its work on this study that cognitive aging is a concern to many people across all cultural groups and income levels. In recent years a vigorous public health, research, and community response has focused on Alzheimer’s disease and other neurodegenerative dementias. These efforts should continue to be strengthened.

BOX S-2
Opportunities for Action

Many of the following actions require multiple efforts involving a number of agencies, organizations, and sectors as well as individuals and families. These efforts will be greatly strengthened by joint and collaborative efforts.

Individuals and families:

- Be physically active and intellectually and socially engaged, monitor medications, and engage in healthy lifestyles and behavior;
- Talk with health care professionals about cognitive aging concerns;
- Be aware of the potential for financial fraud and abuse, impaired driving skills, and poor consumer decision making;
- Make health, finance, and consumer decisions based on reliable evidence from trusted sources.

Communities, community organizations, senior centers, residential facilities, housing and transportation planners, local governments:

- Provide opportunities for physical activity, social and intellectual engagement, life-long learning, and education on cognitive aging; expand relevant programs and facilities;
- Improve walkability and public transportation options in neighborhoods, communities, and cities.

Health care professionals and professional associations and health care systems:

- Learn about cognitive aging and engage patients and families in discussions;
- Pay attention to cognition during wellness visits, prescribing and reviews of medications, and during hospital stays and post-surgery;
- Identify useful and evidence-based community and patient resources and make sure patients and families know about them;
- Develop core professional competencies in cognitive aging as distinct from dementia and other neurodegenerative diseases in treatment and in counseling patients and families
- Address factors that lead to delirium in hospitalized patients.

Public health agencies at the federal, state, and local levels; aging organizations; media; professional associations; and consumer groups:

- Strengthen efforts to collect and disseminate population-based data on cognitive aging as separate from dementia and other neurodegenerative diseases;
- Develop and widely disseminate independent authoritative information resources on cognitive aging and criteria for consumer evaluation of products and medications that claim to enhance cognition;
- Develop, test, and disseminate key messages regarding cognitive aging through social marketing campaigns, media awareness efforts, and other approaches to increase public understanding about cognitive aging; and promote activities that help maintain cognitive health.

Research funders and researchers:

- Explore cognitive aging as separate from dementia and other neurodegenerative diseases in basic, applied, and clinical research;
- Expand research on the trajectories of cognitive aging and improve assessments of cognitive changes and impacts on daily function;
- Focus on research on risk and protective factors for cognitive aging and on developing and improving the implementation of interventions aimed at preventing or reducing cognitive decline and maintaining cognitive health.

Policy makers, regulators, and consumer advocacy and support organizations:

- Support the resources needed to understand and address cognitive aging;
- Determine (or provide input into the appropriate regulatory review) policies and guidelines for products, medications, and other interventions that claim to enhance cognitive function or that have a negative impact on cognition;
- Develop, validate, and disseminate policies, products, services, and informational materials focused on cognitive aging and addressing potential financial, health, and safety impacts, harms, and vulnerabilities.

Private-sector businesses, including the financial, transportation, and technology industries:

- Develop, validate, and disseminate policies, products, services, and informational materials focused on cognitive aging and addressing potential financial, health, and safety impacts, harms, and vulnerabilities.

At the same time, attention needs to be paid to the cognitive vulnerabilities of the vast majority of older adults who may experience cognitive decline that is not caused by a neurodegenerative disease. They too want to maintain their cognitive health to the fullest extent possible. The committee hopes that a commitment to addressing cognitive aging by many sectors of society will bring about further effective interventions, a greater understanding of risk and protective factors, and a society that values and sustains cognitive health.

