Summary of National Academies Products Related to Aging and Technology

This document provides a high-level summary of major reports published by the National Academies that discuss aging, technology, and various related topics that often intersect with them (such as artificial intelligence and financial fraud).

This was developed as a resource for the Hauser Policy Impact Fund webinar, *From Longevity to Vitality: Leveraging Technology for Thriving in Later Life*.

Preventing and Treating Dementia: Research Priorities to Accelerate Progress (2025)

Board on Health Sciences Policy & Board on Behavioral, Cognitive, and Sensory Sciences

This report evaluates the state of biomedical research on dementia prevention and treatment, including behavioral and lifestyle interventions. The report identifies research priorities, with a focus on research to be funded by the National Institutes of Health.

Identified research priorities:

- Develop better tools, including novel biomarker tests and digital assessment technologies, to monitor brain health across the life course and screen, predict, and diagnose AD/ADRD at scale (Research Priority 2-1)

- Implement advances in clinical research methods and tools to generate data from real-world clinical practice settings that can inform future research (Research Priority 2-2)

- Identify factors driving AD/ADRD risk in diverse populations, particularly understudied and disproportionately affected groups, to better understand disease heterogeneity—including molecular subtypes and disparities in environmental exposures—and to identify prevention opportunities and advance health research equity (Research Priority 3-1)

- Characterize the exposome and gene–environment interactions across the life course to gain insights into biological mechanisms and identify opportunities to reduce AD/ADRD risk and increase resilience (Research Priority 3-2)

- Elucidate the genetic and other biological mechanisms underlying resilience and resistance to identify novel targets and effective strategies for AD/ADRD prevention and treatment (Research Priority 3-3)

- Develop integrated molecular and cellular causal models to guide the identification of common mechanisms underlying AD/ADRD and their validation as novel targets for prevention and treatment (Research Priority 3-4)

- Integrate innovative approaches and novel tools into the planning, design, and execution of studies to accelerate the identification of effective interventions (Research Priority 4-1)

- Advance the development and evaluation of combination therapies (including pharmacological and nonpharmacological approaches) to better address the multifactorial nature of AD/ADRD (Research Priority 4-2)

- Evaluate precision medicine approaches for the prevention and treatment of AD/ADRD to better identify interventions likely to benefit specific groups of individuals (Research Priority 4-3)

- Advance the adoption of standardized outcomes for assessing interventions that are sensitive, person-centered, clinically meaningful, and reflect the priorities of those at risk for or living with AD/ADRD (Research Priority 4-4)

- Evaluate the causal effects of public health approaches on overall dementia incidence and incidence in understudied and/or disproportionately affected populations. (Research Priority 4-5)

These priorities are described further in a summary table (Table S-1), viewable here.

The report makes additional recommendations to improve data infrastructure and collection, research methods, and other factors to aid the pursuit of the research priorities.

[Addressing the Impact of COVID-19 on Social Isolation and Loneliness](#) (2024)

Societal Experts Action Network (SEAN)

Rapid expert consultation that outlines strategies for different age cohorts to ameliorate issues of loneliness and social isolation that were exacerbated during the pandemic.

Key strategies:

- Community-based supports: Social connectedness can be enhanced by using existing community infrastructure, including schools, primary care settings, and workplaces, and by leveraging the strengths and resources of community service networks. Tailoring these supports involves understanding the specific needs of each group. For example, youth programs might focus on after-school activities and peer support, while older adults might benefit from community health outreach.

- Community leadership: Partnering with communities to design and deliver services and forging inclusive, action-oriented strategic alliances can enhance social connection and empower communities to identify and sustain community-level solutions. Supporting different community members in taking on leadership roles can facilitate relevant and effective solutions. For example, youth leadership programs can foster a sense of responsibility and connection among young people, while older adults can contribute valuable experience and wisdom to community projects.

- Digital environments: The rise in digital innovations presents opportunities to address loneliness and social isolation through online support groups, social media interactions, information discovery, resource access, and service delivery. The use of digital platforms should be tailored to the target population. Teens and young adults might be more engaged through social media and online gaming communities, while older adults might prefer accessible electronic devices to communicate with friends and family, virtual community centers, or health forums that provide a space for social interaction and support.

- Social infrastructure: Inclusive design is crucial for making public spaces accessible and appealing to all age groups. Designing inclusive and multifaceted public infrastructure, including libraries, community gardens, and community centers, and offering diverse local destinations, such as shops, cafes, and restaurants, can
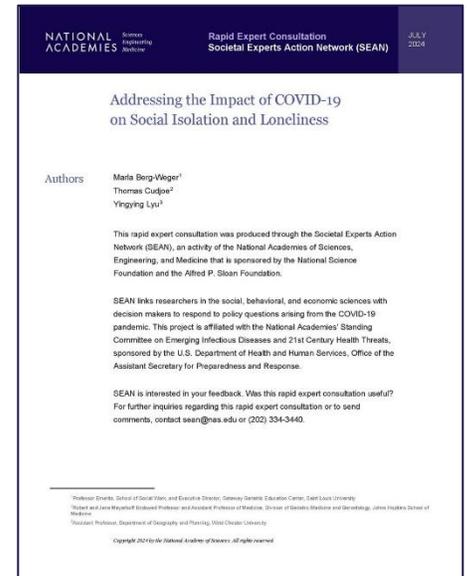
promote social connectedness and alleviate loneliness. Mixed-use planning brings diverse amenities nearby, while transportation options enhance access to these facilities.

- Comprehensive policy initiatives: Proactive policymaking can aid the development of legislation and policies to enhance social connectedness and provide ongoing support for community and social programs, addressing different groups' unique challenges. For example, policies aimed at youth might focus on improving mental health services in schools. In contrast, policies targeting the middle-aged population might focus on promoting or modifying leave policies for workers taking care of children and aging parents, and those aimed at older adults might prioritize access to community-based health care and social services.

Global Roadmap for Healthy Longevity (2022)

National Academy of Medicine

Seminal report outlined several goals and associated recommendations to achieve them. In general, the report outlines a framework that leaves many opportunities for local decision-makers to customize policies for their own context. Summary of the roadmap is provided via a table, viewable here.

The identified goals are:

1. Economic and social benefits generated by people living, working, volunteering, and engaging longer

2. Social infrastructure, institutions, and business systems that enable safe and meaningful work and other community engagement at every stage of life

3. Education and training opportunities that promote participation in lifelong learning and growth

4. Social cohesion augmented by intergenerational connections and the creation of opportunities for purposeful engagement by older people at the family, community, and societal levels

5. Social protections and financial security that mitigate the effects of financial vulnerability at older ages
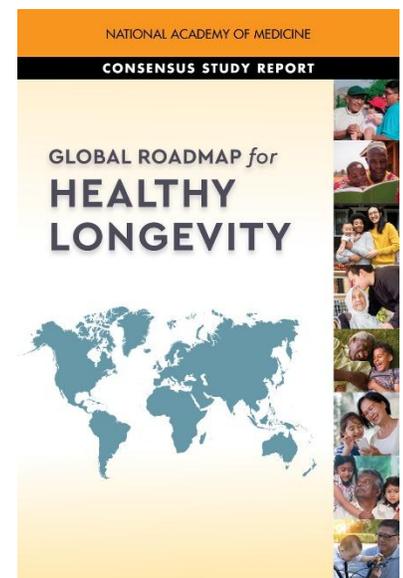
6. Physical environments and infrastructure that support functioning and engagement for people at older ages

7. Integrated public health, social service, person-centered health care, and long-term care systems designed to extend years of good health and support the diverse health needs of older people

8. Quality long-term care systems to ensure that people receive the care they require in the setting they desire for a life of meaning and dignity

Reducing the Impact of Dementia: A Decadal Survey of the Behavioral and Social Sciences (2021)

Board on Behavioral, Cognitive, and Sensory Sciences

The report draws out several priorities for future social and behavioral science research related to dementia.

Five identified priorities (Conclusion 9-1):

1. Improvements in the lives of people affected by dementia, including those who develop it and their families and caregivers, as well as in the social and clinical networks that surround them, through research on factors that affect the development of disease and its outcomes, promising innovative practices and new models of care, and policies that can facilitate the dissemination of interventions found to be effective.

2. Rectifying of disparities across groups and geographic regions that affect who develops dementia, how the disease progresses, outcomes and quality of life, and access to health care and supportive services.

3. Development of innovations with the potential to improve the quality of care and social supports for individuals and communities and to support improved quality of life (e.g., reducing financial abuse and stressors, finding relevant affordable housing and care facilities, gaining access to important services).

4. Easing of the financial and economic costs of dementia to individuals, families, and society and balancing of long-term costs with long-term outcomes across the life span.
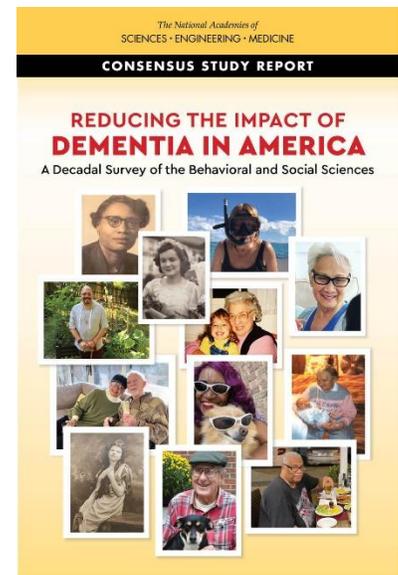
5. Pursuit of advances in research capability, including study design, measurement, analysis, and evidence integration, as well as the development of data infrastructure needed to study key dementia-related topics.

Mobile Technology for Adaptive Aging: Proceedings of a Workshop (2020)

Board on Behavioral, Cognitive, and Sensory Sciences

This report summarizes a 2019 workshop that addressed the proliferation of mobile technologies since the 2004 *Technology for Adaptive Aging* report (summarized below). As in the 2004 workshop and report, this workshop included six commissioned papers that all articulated a different perspective on how mobile technologies impact older adults.

The six commissioned papers are titled:

1. Trust, Privacy and Security, and Accessibility Considerations When Conducting Mobile Technologies Research With Older Adults

2. Mobile Monitoring and Intervention (MMI) Technology for Adaptive Aging

3. Mobile and Sensor Technology as a Tool for Health Measurement, Management, and Research with Aging Populations

4. Use of Technologies for Social Connectedness and Well-Being and as a Tool for Research Data Collection in Older Adults

5. Using Machine Learning to Forecast and Improve Clinical Outcomes and Healthy Aging Using Sensor Data

6. Sensors in Support of Aging-in-Place: The Good, the Bad, and the Opportunities

[The Promise of Assistive Technology to Enhance Activity and Work Participation](#)
(2017)

Board on Health Care Services

This report examples certain assistive technologies to identify their level of access and uptake as well as the impact they have in enabling users to excel in the workforce. The report focuses primarily on adults of working age that are living with disabilities. No recommendations are made, but the committee outlines several conclusions:

1. Assistive products and technologies hold promise for partially or completely mitigating the impacts of impairments and enhancing work participation when appropriate products and technologies are available, when they are properly prescribed and fitted, when the user receives proper training in their use and appropriate follow-up, and when societal and environmental barriers are limited.

2. When matching individuals with appropriate assistive products and technologies, it is important to understand the complexity of factors that must be optimized to enhance function. Selecting, designing, or modifying the correct device for an individual and providing training in its use, as well as appropriate follow-up, are complex but necessary elements for maximizing function among users of assistive products and technologies.

3. Access to appropriate assistive products and technologies and to qualified providers and teams with the knowledge, skill, and expertise necessary to properly evaluate, fit, train, and monitor people in the use of those products and technologies is frequently limited and varies considerably from case to case, state to state, district to district, urban to rural and frontier areas, and funding source to funding source.

4. The variability of coverage for assistive products, technologies, and related services is an important impediment to optimizing function and maintaining gainful employment among transitioning youth and adults with impairments.

5. Education regarding the availability of assistive products and technologies and knowledge and training that empower users to self-advocate or have a significant other (e.g., family member, friend, or professional) advocate for them are
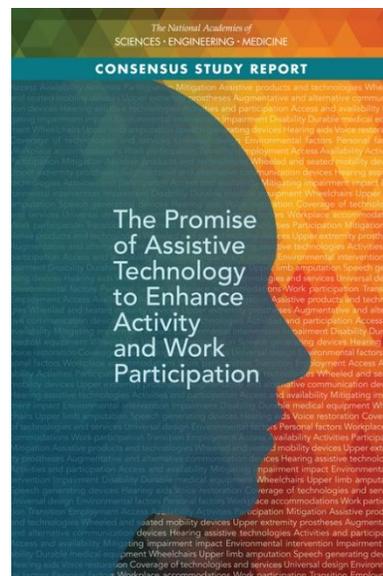
important elements in achieving successful access to appropriate assistive products and technologies and related services.

6. Assistive products and technologies are advancing at a much faster rate relative to clinician education, regulations, and reimbursement systems, which may limit access to these devices and/or access to training in their use.

7. Some coverage and disability benefit models, such as those of the Veterans Health Administration, state vocational rehabilitation agencies, some private disability insurance carriers, and a few private health insurers, are more holistic than others, providing access to a greater range of assistive products and technologies and related services that can be appropriate to meeting individuals' needs and facilitating their ability to work.

8. Professionals involved in disability determinations cannot assume that because an individual uses a particular assistive product or technology, this device is always effective for that person, that it mitigates the impact of the person's impairment, or that it enables the person to work. Environmental, societal, and personal factors also must be taken into account.

9. Additional research is needed to understand how the specifications for and use of assistive technologies and products and related services impact inclusion in society and work participation for individuals with disabilities. Such research may not only enhance knowledge in these areas but also inform the development of rational resource utilization, including informing cost-benefit analyses and coverage for devices and related services.

Cognitive Aging: Progress in Understanding and Opportunities for Action (2015)

Institute of Medicine

This report explores the science of cognitive aging (more broadly than just dementia) and its public health dimensions, with focus on epidemiology, prevention, education of health professionals, and public awareness.

Recommendation #9 touches on elder abuse and exploitation:

*   Relevant federal and state agencies (including the Administration for Community Living [ACL], the Centers for
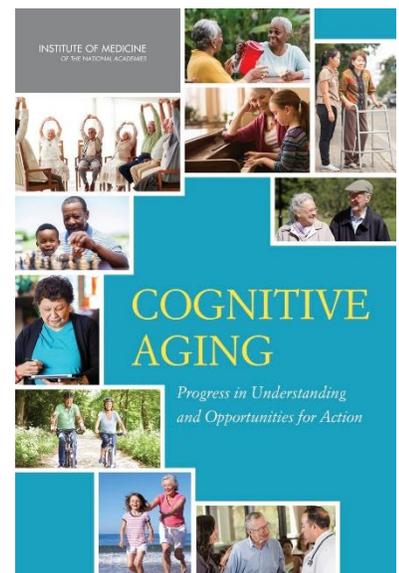
Disease Control and Prevention [CDC], the National Highway Traffic Safety Administration [NHTSA], and the Consumer Financial Protection Bureau), nonprofit organizations (such as the Financial Industry Regulatory Authority), professional associations, and relevant private-sector companies and consumer 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.

Fostering Independence, Participation, and Healthy Aging Through Technology: Workshop Summary (2013)

Institute of Medicine & Division of Behavioral and Social Sciences and Education

This report summarizes a 2012 workshop that explored the potential for assistive and supportive technologies to "increase the number of disability-free years in the average life span". The report is organized into five major themes from the workshop:

1. Exemplars of technology's potential to restore functional capacity and avert deterioration in functioning

2. The use of technology to promote activities of daily living and independence

3. The role of technology in promoting community integration and participation in the context of community design

4. Community integration and participation from the perspective of social connectedness

5. The role of technology in managing and promoting health
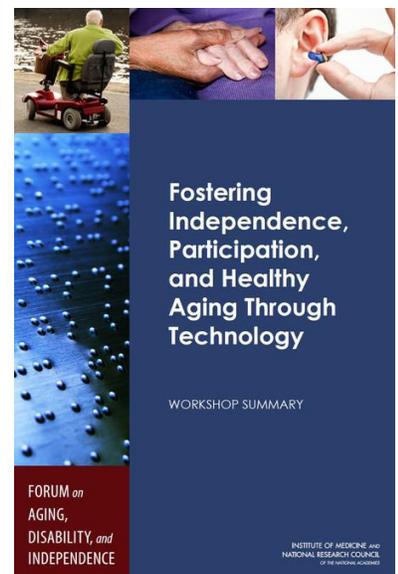
[Health Care Comes Home: The Human Factors](#) (2011)

Board on Human-Systems Integration

This report responds to the increasing amount of healthcare services performed in the home rather than at the hospital by exploring the important human factors considerations that underpin effective use of assistive technologies in the home. The report makes a number of recommendations aimed at improving home healthcare through the use of technology.

Recommendations:

1. The U.S. Food and Drug Administration and the Office of the National Coordinator for Health Information Technology should collaborate to regulate, certify, and monitor health care applications and systems that integrate medical devices and health information technologies. As part of the certification process, the agencies should require evidence that manufacturers have followed existing accessibility and usability guidelines and have applied user-centered design and validation methods during development of the product.

2. The Office of the National Coordinator for Health Information Technology, in collaboration with the National Institute of Standards and Technology and the Agency for Healthcare Research and Quality, should establish design guidelines and standards, based on existing accessibility and usability guidelines, for content, accessibility, functionality, and usability of consumer health information technologies related to home-based health care.

3. The U.S. Food and Drug Administration (FDA) should promote development (by standards development organizations, such as the International Electrotechnical Commission, the International Organization for Standardization, the American National Standards Institute, and the Association for the Advancement of Medical Instrumentation) of new standards based on the most recent human factors research for the labeling of and ensuing instructional materials for medical devices designed for home use by lay users. The FDA should also tailor and streamline its approval processes to facilitate and encourage regular improvements of these materials by manufacturers.

4. The U.S. Food and Drug Administration should improve its adverse event reporting systems to be easier to use, to collect data that are more useful for identifying the root causes of events related to interactions with the device
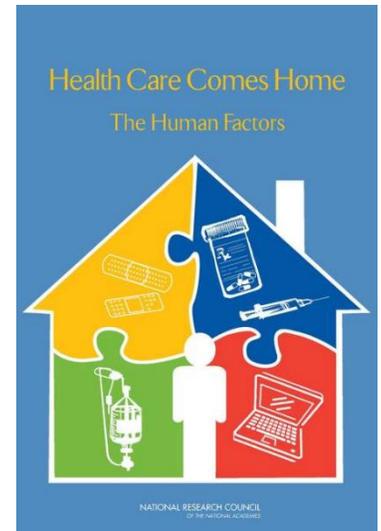
operator, and to develop and promote a more convenient way for lay users as well as professionals to report problems with medical devices.

5. Relevant professional practice and advocacy groups should develop appropriate certification, credentialing, and/or training standards that will prepare formal caregivers to provide care in the home, develop appropriate informational and training materials for informal caregivers, and provide guidance for all caregivers to work effectively with other people involved.

6. Federal agencies, including the U.S. Department of Health and Human Services and the Centers for Medicare & Medicaid Services, along with the U.S. Department of Housing and Urban Development and the U.S. Department of Energy, should collaborate to facilitate adequate and appropriate access to health- and safety-related home modifications, especially for those who cannot afford them. The goal should be to enable persons whose homes contain obstacles, hazards, or features that pose a home safety concern, limit self-care management, or hinder the delivery of needed services to obtain home assessments, home modifications, and training in their use.

7. Federal agencies, such as the U.S. Department of Housing and Urban Development, the U.S. Department of Veterans Affairs, and the Federal Housing Administration, should take a lead role, along with states and local municipalities, to develop strategies that promote and facilitate increased housing visitability, accessibility, and universal design in all segments of the market. This might include tax and other financial incentives, local zoning ordinances, model building codes, new products and designs, and related policies that are developed as appropriate with standards-setting organizations (e.g., the International Code Council, the International Electrotechnical Commission, the International Organization for Standardization, and the American National Standards Institute).

8. The Agency for Healthcare Research and Quality should support human factors–based research on the identified barriers to coordination of health care services delivered in the home and support user-centered development and evaluation of programs that may overcome these barriers.

9. The U.S. Food and Drug Administration, in collaboration with device manufacturers, should establish a medical device database for physicians and other providers, including pharmacists, to use when selecting appropriate devices to prescribe or recommend for people receiving or self-administering health care in the home. Using task analysis and other human factors approaches to populate the medical device database will ensure that it contains information on

characteristics of the devices and implications for appropriate care recipient and device operator populations.

10. Federal health agencies should coordinate data collection efforts to capture comprehensive information on elements relevant to health care in the home, either in a single survey or through effective use of common elements across surveys. The surveys should collect data on the sociodemographic and health characteristics of individuals receiving care in the home, the sociodemographic attributes of formal and informal caregivers and the nature of the caregiving they provide, and the attributes of the residential settings in which the care recipients live.

11. The Agency for Healthcare Research and Quality should collaborate, as necessary, with the National Institute for Disability and Rehabilitation Research, the National Institutes of Health, the U.S. Department of Veterans Affairs, the National Science Foundation, the U.S. Department of Defense, and the Centers for Medicare & Medicaid Services to support development of assessment tools customized for home-based health care, designed to analyze the demands of tasks associated with home-based health care, the operator capabilities required to carry them out, and the relevant capabilities of specific individuals.

When I'm 64 (2006)

Board on Behavioral, Cognitive, and Sensory Sciences

In the context of increasing average age and life expectancy, this report suggests areas for interdisciplinary future research geared towards improving the health and well-being of older adults.

Recommendations:

- On the basis of the needs of the aging population and the benefits to individuals and to society that could be achieved through research, the committee recommends that the National Institute on Aging concentrate its research support in social, personality, and life-span psychology in four substantive areas: motivation and behavioral change; socioemotional influences on decision making; the influence of social engagement on cognition; and the effects of stereotypes on self and others.
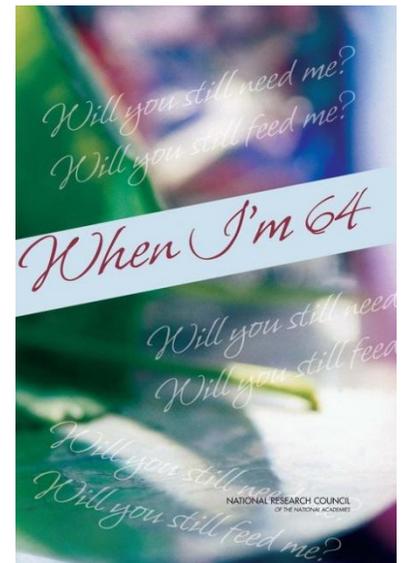
- The committee recommends that psychological research help to further clarify whether race, culture, ethnicity, gender, and socioeconomic class are associated with fundamental psychological processes represented in each of the committee's recommended research areas.

- In order to carry out the committee's proposed research program, the committee recommends that the National Institute on Aging provide support for research infrastructure in psychology and methods development in aging research, including interdisciplinary and multilevel approaches, in order to make progress in each of the other recommended areas more likely and more rapid.

[Technology for Adaptive Aging]() (2004)

Board on Behavioral, Cognitive, and Sensory Sciences

This report offers a summary of and committee commentary on a workshop that explored different domains in which assistive technologies could help adults as they age. The committee identified six particularly important domains: communication, employment, health, learning, living environments, and transportation. The report makes a general recommendation that the National Institute on Aging and other federal agencies prioritize research on adaptive technologies so that technology development and commercialization does not rely entirely on market forces.
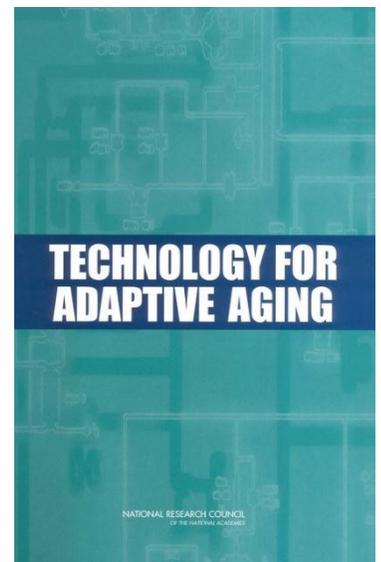

[Elder Mistreatment: Abuse, Neglect, and Exploitation in an Aging America]() (2003)

Committee on National Statistics & Committee on Law and Justice

This report advances a research agenda to better understand the problem of elder abuse and mistreatment. Given widespread understanding that abuses are underreported, and that there is limited data infrastructure available to research interested in understanding it, the report recommends:

- Basic research on the phenomenology of elder mistreatment;
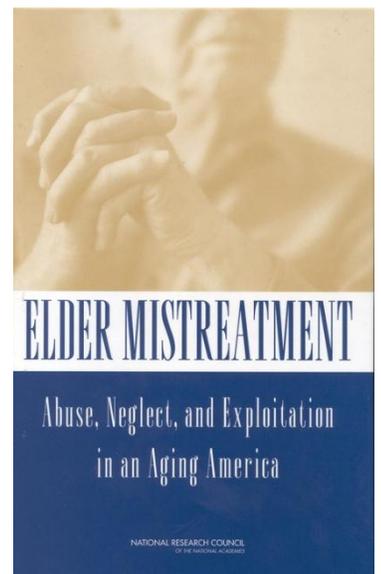
- Development of widely accepted operational definitions and validated and standardized measurement methods for the elements of elder mistreatment;

- Population-based surveys of elder mistreatment occurrence, with preparatory funding provided to develop and test measures for identifying elder mistreatment;

- Funding agencies prioritizing the design and fielding of national prevalence and incidence studies of elder mistreatment, to include both a large-scale, independent study of prevalence as well as modular add-ons to surveys of aging populations;

- Development of new methods of sampling and identifying elder mistreatment victims in the community;

- More longitudinal investigations, including follow-up studies of the clinical, social, and psychological outcomes of elder mistreatment cases, in order to understand the clinical course, antecedents, and outcomes of various types of elder mistreatment;

- Development of new study sampling and detection methods to characterize the occurrence of elder mistreatment in the institutional setting, including hospitals, long-term care, and assisted living situations;

- Studies that examine risk indicators and risk and protective factors for different types of elder mistreatment;

- Expansion of research on risk factors to take into consideration the clinical course of elder mistreatment;

- Substantial research to improve and development new methods of screening for possible elder mistreatment in a range of clinical settings;

- Research on the process of designating cases as incidents of mistreatment in order to improve criteria, investigative methods, decision-making processes, and decision outcomes;

- Research on the effects of elder mistreatment interventions, including evaluating existing interventions to prevent or ameliorate elder mistreatment as well as a requirement that agencies funding new intervention programs include scientifically adequate evaluation as a component of the grant;

- Clearer guidelines for investigators and institutional review boards concerning two issues that tend to occur in elder mistreatment research: conditions under which research can properly go forward with participants whose decisional capacity is

impaired, and the proper responses to evidence of mistreatment elicited during the course of the study; and

- An adequate, long-term funding commitment to research on elder mistreatment by relevant federal, state, and private agencies, in order to support research careers and develop the next generation of investigators in the field.