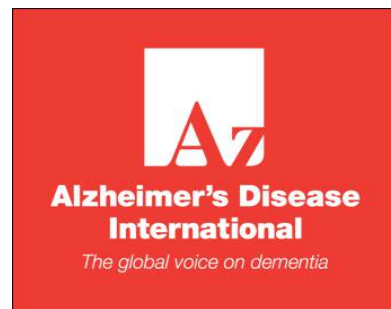


PARTICIPATION IN DEMENTIA TRIALS AND STUDIES: CHALLENGES AND RECOMMENDATIONS

PAPER PREPARED FOR GLOBAL ACTION AGAINST DEMENTIA BY ALZHEIMER'S DISEASE
INTERNATIONAL MEMBER CHARITIES



“I can think of no other condition that has such a profound effect on loss of function, loss of independence, and the need for care. I can think of no other condition that places such a heavy burden on society, families, communities, and economies. I can think of no other condition where innovation, including breakthrough discoveries, is so badly needed.”

DR. MARGARET CHAN, DIRECTOR GENERAL OF THE WORLD HEALTH ORGANIZATION,
SPEAKING AT THE G8 DEMENTIA SUMMIT, 11 DECEMBER 2013

TABLE OF CONTENTS

Introduction	4
Consumer challenges to participation in dementia research.....	5
Lack of awareness	5
Physician challenges.....	6
Study partner requirement	7
Trial design	7
Cultural and linguistic differences.....	8
Socioeconomic status and educational factors.....	9
Coexisting conditions	9
Industry challenges that affect participation in dementia research	10
Multiple regulatory processes.....	10
Variation in assessment tools and measures.....	11
Uncertain return on investment	11
What countries can do to address challenges to dementia research	12
References	18

INTRODUCTION

Alzheimer's disease and other dementias are a global health epidemic. Today, more than 44 million people worldwide are living with dementia. In the absence of disease-modifying treatments, worldwide prevalence will soar to nearly 76 million people by 2030.¹ In 2010, the total direct and indirect cost of caring for these individuals was US\$604 billion.² Unless something is done to change its course, Alzheimer's and other dementias will threaten economies around the globe and disproportionately affect low and middle income countries.²

Currently, Alzheimer's disease cannot be prevented, cured or even slowed. Available treatments provide only modest benefit of symptoms and are effective for a limited time.³ To achieve scientific advances that identify new therapies to address the underlying cause of the disease, expanding current research must be of the highest priority. But to do this, researchers need a sufficient pool of volunteers to participate in dementia clinical trials and other studies. Presently, there is a dearth of volunteers taking part in dementia research, despite the millions affected by Alzheimer's and other dementias. Many of these individuals face challenges that impede their awareness of or involvement in clinical trials and other studies.

Scientists have made remarkable strides in recent years in dementia research. International governments can build on this momentum and change the current trajectory by supporting clinical investigations in neurodegenerative diseases. This paper outlines challenges to participation in dementia clinical trials and other studies, and suggests actions countries can take to address these issues. This document was developed with significant input by a workgroup of charities under the auspices of Alzheimer's Disease International. The workgroup consisted of the Alzheimer's Association, Alzheimer's Research UK, Alzheimer's Society, Alzheimer Society of Canada, Alzheimer's Foundation - Czech Republic, and Alzheimer Nederland.ⁱ

ⁱ This document also benefited from review by Susan Abushakra, MD, Chief Medical Officer, D5 Program Leader, Transition Therapeutics USA; and Jeff Sevigny, MD, Medical Director, Neurological Disorders, Biogen Idec.

CONSUMER CHALLENGES TO PARTICIPATION IN DEMENTIA RESEARCH

Low participation in clinical trials and other studies is one of the major challenges to advancing clinical dementia research. While observations can be made in smaller studies, researchers must show efficacy by replicating and validating their findings in large, diverse populations.⁴ Thus, an increasing number of dementia trials and other studies are extensive in scale and scope, and being executed at multiple sites in geographically dispersed regions.⁵ This makes recruitment of an adequate number of participants who meet study criteria time consuming and difficult. A review of 24 multi-site phase II and phase III Alzheimer's clinical trials found only one-third were able to enroll study volunteers within a year.⁶

Even though Alzheimer's and other dementias affect millions of people worldwide, only a fraction of these individuals partakes in clinical trials and other studies. Slow enrollment lengthens the timeline of such trials, making them take longer to execute and complete than they would have if there were sufficient volunteers available. The longer timeline and slow enrollment can also impede the reliability of trial results, making it harder for researchers to identify what factors affected their findings. This ultimately leads to the slow development of new treatments and therapies for those dealing with dementia.

Unfortunately, potential volunteers across the globe face a number of hurdles to participation. Major factors impeding sufficient enrollment in dementia trials and other studies include consumer challenges such as a lack of awareness of opportunities; physician challenges; the study partner requirement; trial design; cultural and linguistic challenges; socioeconomic status and education; and coexisting conditions.

LACK OF AWARENESS

Potential volunteers are likely to participate in dementia research for perceived personal benefit⁷ or altruistic reasons.^{6,8} They are also more likely to participate if they receive clear information about trial requirements and expected outcomes from members of the research team.⁷ But reaching these types of individuals to volunteer requires heightened awareness among the general public and among the medical community specifically (discussed below), about dementia and dementia research.

In many countries, there is a general lack of awareness about dementia itself and the purpose of dementia clinical trials and other studies. Some individuals mistake dementia as a normal part of aging or believe nothing can be done about it.² This can lead to misperceptions and stigma, causing some people to delay seeking medical assistance or a diagnosis. This lack of awareness is one of the biggest challenges to dementia trial recruitment.⁹ Many individuals affected by dementia do not know they can participate in clinical trials or where to find information on studies in their area.¹⁰ Even those who do learn about research opportunities may not fully understand the clinical trial process.¹¹ The lack of a clear pathway for enrollment across studies makes the process all the more confusing.^{10,12} Consequently, potential candidates for trial enrollment are not introduced to dementia research and clinical trials and other studies are not perceived as viable treatment options.

Increasing the understanding of the wide range of volunteers that researchers are looking for is particularly important for dementia studies that examine risk reduction and prevention. This includes people living with dementia, their care partners, and other healthy volunteers who have no symptoms or no familial history of dementia.

PHYSICIAN CHALLENGES

Like people living with dementia and their families, low physician awareness of dementia clinical trials and other studies is a significant challenge to enrollment. A survey across five European countries found only 19 percent of physicians, on average, were aware of a single clinical trial recruiting in their areas. But among those aware of clinical trial opportunities, nearly all said they would recommend participation to their patients.¹³ In the United States, close proximity to a research center was a predictor for physician referral,¹⁴ further highlighting the importance of physician awareness to dementia trial recruitment.

Similarly, low awareness of clinical trials and other studies among frontline staff at hospitals and academic health institutions can also be a challenge. An exercise on patient-initiated inquiries to clinical studies in the United Kingdom found 46 percent of receptionists at surveyed National Health Service (NHS) Trust sites said they were not involved with research, directed inquiries to another location or had no suggestions at all.¹² Among those who were directed to a patient liaison representative, over half felt they did not receive clear guidance about next steps to participate in clinical research.¹²

Another major obstacle to physician referral is the limited time available during patient visits.¹⁴ Time and reimbursement constraints in a country's health system compel health care providers to spend what limited time they have addressing a patient's immediate health issues. Consequently, referral to research is not a common component of the care continuum for people diagnosed with Alzheimer's or other dementias.

Other physician challenges include perceptions about potentially losing patients to clinical trials,¹¹ the risks associated with participation,¹⁴ and the ability of physicians to recognize cognitive decline in patients.¹⁵ This last point is a significant challenge in countries where attitudes on aging can influence perceptions and delay diagnosis,⁵ and where there is little consensus on good clinical practice with ethnic and minority patients.¹⁶

STUDY PARTNER REQUIREMENT

Participation in clinical trials and other studies by individuals living with Alzheimer's or other dementias often requires a study partner.^{6,9} As an irreversible neurological disease, Alzheimer's disease impairs cognition, orientation and functional capacity.³ Study partners offer critical support such as assistance in the consent process, transportation to and from trial sites, administration of medications in drug trials, and monitoring and reporting enrollees' condition and progress.^{6,9}

Unfortunately, some individuals may be excluded from trial enrollment because they do not have access to a study partner or the study partner is not capable of providing the support needed for trial participation. Because most individuals living with Alzheimer's or other dementias are older adults,³ potential volunteers may not have access to a study partner (e.g. if they are widowed) or they may reside in an institutional setting where a study partner cannot regularly observe health outcomes. The time commitment associated with the role of study partners can also be discouraging.⁸ Study partners, particularly adult children, may have other obligations such as employment or care for young family members, and feel they have insufficient time to commit for the duration and demands of a trial.^{6,8}

TRIAL DESIGN

One of the attractive benefits of enrolling in a clinical trial is the potential to receive more information about a diagnosis and access to potential

treatments.^{7,8} But clinical trials are designed with specific inclusion criteria for enrollment, limiting the number of volunteers who qualify for participation.⁶ Moreover, many Alzheimer's and dementia clinical trials and other studies sometimes require volunteers to participate in diagnostic tests such as lumbar punctures or magnetic resonance imaging (MRI) scans. Tolerance for such invasive procedures may be dependent on the perceived effect they have on a participant's level of cognition and function.⁷ Others may perceive these techniques as intrusive or time consuming, and be deterred by potential side effects.^{6,8,9}

Specifically in drug trials, while some individuals may be amenable to being in the control group that receives a placebo, others perceive the risk of receiving a placebo as a major hindrance to participation.^{6,9} For some, receiving a placebo is a larger deterrent than the possibility of receiving a treatment that produces side effects or little efficacy.⁷ While individuals may participate in dementia research for altruistic reasons,^{6,8} the potential lack of direct benefit makes it difficult for some volunteers and their study partners to willingly subject themselves to the demands of the trial process.^{7,9}

The different components of the trial process can be very confusing to individuals with cognitive impairments. Site staff may not be well trained on how to answer questions or alleviate concerns related to trial design. Investigators may also overlook the patient perspective when designing studies, missing an opportunity to demystify the trial process and make it a more dementia-friendly experience. And some studies may inadvertently discourage trial volunteers who are in the midst of the screening process by turning them away when studies meet sufficient enrollment numbers.

CULTURAL AND LINGUISTIC DIFFERENCES

Cultural differences can also affect awareness and participation in dementia research. Individuals from diverse communities may be skeptical or suspicious of research and institutional settings,^{8,9} or may perceive trial participation will not benefit their communities.¹⁷ Misconceptions or inadequate understanding of the purpose of clinical trials can further deter ethnic and minority populations from participating in research.¹⁷ For example, terms like "research," "trials" and "studies" may be subject to different interpretations based on cultural values or a country's historical experience.⁹

Linguistic differences can also hinder trial participation by encumbering communication with clinicians. For example, an evaluation of clinical practices at 36 centers in 15 European countries revealed language barriers and education levels affected adequate cognitive assessment and delivery of services for patients with ethnic and minority backgrounds.¹⁶ Many centers reported communication challenges in the administration of cognitive tests, in the types of instruments used, and when seeking consent for ancillary tests such as brain scans.¹⁶

SOCIOECONOMIC STATUS AND EDUCATIONAL FACTORS

In many countries, characteristics such as socioeconomic status and education level can affect participation in dementia clinical trials and other studies. Individuals with few financial resources may not seek medical assistance for symptoms of cognitive impairment, limiting the possibility of referral to clinical studies,¹⁷ although this may be less of an issue in countries where national health care laws ensure access to clinical services.¹⁶ Economically disadvantaged volunteers may also experience financial hardship traveling to trial sites.¹⁷ Clinical trials frequently take place in urban settings, making it more difficult for those living in rural communities to learn about research opportunities and to access studies. This financial burden can also be a deterrent for study partners.

Likewise, individuals with lower education may find it difficult to understand information about the trial process.¹⁷ For example, documentation on study procedures and potential risks are given to trial volunteers with consent forms – certifications that verify free participation and receipt of requisite trial materials. Consent forms are intentionally written in simple terms, but have increasingly become highly legalized documents with an immense amount of information. Because people with fewer years of formal education are at higher risk for Alzheimer’s and other dementias,³ and because ethnic and minority populations tend to experience lower education and socioeconomic status, investigators must carefully consider these factors in their recruitment strategies.

COEXISTING CONDITIONS

The presence of comorbid conditions is another challenge in trial enrollment. Many clinical trials and other studies test interventions for a specific disease, limiting the pool of potential participants to those without coexisting conditions. In dementia clinical trials and other studies, Alzheimer’s can complicate the

management of other comorbid health conditions and many people with Alzheimer's have one or more of them.² This can lead to poor health and impede participation in clinical studies. Moreover, individuals taking medications for dementia symptoms or other health conditions may involuntarily exclude themselves from trial enrollment.^{6,9} Medical devices, such as pacemakers, may also disqualify potential volunteers from certain studies.⁶ While coexisting conditions are not modifiable by study investigators, they highlight the need to advance understanding of the basic science of dementia and mixed dementia.

INDUSTRY CHALLENGES THAT AFFECT PARTICIPATION IN DEMENTIA RESEARCH

In addition to consumer challenges, there are several industry challenges that can affect the development and execution of clinical trials and other studies. Without addressing these challenges, the number of possible dementia studies available for participation may decrease, reducing opportunities for potential volunteers. These include multiple regulatory processes, variation in assessment tools and measures, and uncertain return on investment. Given that trial enrollment depends on a sufficient number of participants that meet study criteria, overcoming these industry obstacles is important to ensuring ample opportunities are available for potential volunteers to access and qualify for dementia clinical trials and other studies.

MULTIPLE REGULATORY PROCESSES

As geographically dispersed multi-center clinical trials and other studies for neurodegenerative diseases continue to grow, they face a number of challenges that can affect enrollment. One of the biggest challenges is navigating the regulatory processes of different countries at the national and local levels. For example, participating sites must obtain separate ethical review or institutional review board (IRB) approvals as mandated by a country's regulations. Even sites within the same country may have differing IRB processes, and changes at one site can affect protocol for an entire study.¹⁸ In Europe, local review requirements generally preempt any time savings associated with harmonized efforts involving three or more European Union countries. Supply chain regulations such as varying import and export restrictions across different countries can also complicate how researchers obtain and handle samples in clinical studies.¹⁸ Dealing with multiple regulatory bodies stretches trial site resources, creates an administrative burden and can lengthen project timelines

for study sponsors. Subsequently, companies may choose to conduct clinical trials and other studies in locations where regulations are successfully harmonized to ensure both patient safety and efficiency in study execution. This can unintentionally limit access to trial opportunities if willing volunteers reside in countries with processes that unduly slow clinical research.

VARIATION IN ASSESSMENT TOOLS AND MEASURES

Although not a direct hurdle to trial enrollment, effective study execution depends on assessment tools and measures for data analysis. While multi-center international dementia trials and studies capture social diversity and biological factors otherwise missed in homogeneous study populations, their expansion also introduces differences that can affect research methodology and findings.⁴ There is wide variation of assessment tools used across clinical sites in different countries.^{16,19} Local translation of trial instruments and interpretation of data can also be influenced by cultural values.^{5,16,18,20} This can lead to variation in clinical measures and obscure the efficacy of tested interventions, thereby making it difficult to compare and harmonize findings for large-scale efforts.

Furthermore, inconsistent measures have the potential of being an even more significant issue in asymptomatic and early stage Alzheimer's studies where researchers have to identify subtle neural differences with the appearance of few, if any, symptoms.²⁰ In these studies, the patient perspective plays an important role in testing the effectiveness of interventions in clinical trials by providing keen insight into their own experiences. Altruistic individuals may find the opportunity to inform the human drug and biologic review process a reason to enroll, but current measures to capture their perspectives are limited in consistency and comparability across multiple populations.

UNCERTAIN RETURN ON INVESTMENT

Underlying challenges to enrollment in dementia clinical trials and other studies is the uncertain environment of drug development for neurodegenerative diseases. As major investors in dementia research and development, biopharmaceutical companies provide critical translation of novel ideas into clinical practice. However, the protracted timeline of drug development – an average of 10 to 15 years – and the high failure rate for Alzheimer's and dementia therapies²¹ makes neurological disease research a costly venture for the private sector.

What's more, companies that make significant investments in dementia research face limited protections of their findings. Patents to protect discoveries are sought by industry throughout the research process, but due to the lengthy drug development timeline, may expire before or shortly after a therapy goes to market. As a result, manufacturers may not be able to recoup their research and development investments. The recent wave of patent expirations, known as the "patent cliff,"²² has caused some drug manufacturers to reconsider where to invest future research funds as they experience near-term profit losses. The high risk associated with dementia research means companies have to decide if they want to continue to gamble, consolidate their resources or exit the field altogether. This environment is also hurting the biotechnology community that depends on venture capital and other sources of private funding. Securing such funding for Alzheimer's- and dementia-focused biotechnology has become increasingly difficult and will ultimately reduce the number of these companies that exist. For potential trial volunteers, these unfavorable conditions can decrease the number of study opportunities available to them, further diminishing their chances of participation.

WHAT COUNTRIES CAN DO TO ADDRESS CHALLENGES TO DEMENTIA RESEARCH

In light of the current and future impact of Alzheimer's disease and other dementias, international leaders must support the development of scientific advances toward better treatments and ultimately, a cure. The most effective role governments can play in supporting and facilitating coordination of dementia clinical trial enrollment efforts is to expand opportunities to participate in research, provide education broadly, and streamline regulatory processes to promote efficiency and collaboration among interested parties.

- ❖ *Increase funding for dementia research.* Despite recent increases in research funding by the United States and United Kingdom, a chronic government underinvestment in dementia research persists. Additional funding would enable the pursuit of novel ideas and more basic science, the foundation of all clinical studies, and improve understanding of how to address the challenge of coexisting conditions in dementia research. More funds are also needed for translational science to study the biological mechanisms of potential therapies and non-pharmacological interventions. A rise in research funding will allow more studies to occur, giving potential volunteers more opportunities to qualify for participation.

- ❖ *Increase public awareness of Alzheimer's disease and other dementias.* Governments can educate the public about Alzheimer's disease and other dementias, the signs and symptoms of cognitive impairment, and when to seek medical assistance. Increasing understanding about neurodegenerative diseases can reduce misperceptions and stigma, and encourage early detection and diagnosis. National campaigns can target education to the general public to increase their knowledge about dementia; to older populations who are at higher risk of developing dementia; and to primary care professionals who generally are the first to see people seeking assistance with issues of cognitive impairment.

- ❖ *Increase awareness of dementia research.* For participants, looking for suitable studies and understanding their criteria can be confusing, especially for those who do not consider participating in clinical trials and other studies until disease enters their lives, such as after receiving an Alzheimer's diagnosis. Government agencies can facilitate coordination of trial recruitment efforts by educating the public on the value of participation in the drug development process and the current dearth of volunteers. They can share trial results in familiar language to motivate potential volunteers to enroll or encourage current trial participants to volunteer for another study. They can also ease concerns about participant safety by educating interested parties on the risks involved in clinical trials and other studies and the safeguards employed to mitigate them. Educating the public about oversight mechanisms such as IRBs, data monitoring committees, and government resources can provide the necessary reassurance to potential volunteers that their safety is a priority. Furthermore, public health officials can promote partnerships and strategies to educate local participation in clinical studies on cognitive health and conduct outreach to diverse and underserved populations, a key step to increasing the number of racial and ethnic minorities that participate in dementia research.

- ❖ *Incorporate dementia research into the care continuum.* Government agencies can also raise awareness about the value of clinical studies and patient referral among health care providers, an important gateway to potential study candidates. Referral to dementia research should be incorporated into the care continuum by asking health centers to encourage physicians to discuss research opportunities with their dementia patients and to share information about clinical trials and other studies in public spaces. Countries can also encourage incorporation of information about neurodegenerative diseases such as Alzheimer's into their primary care

medical school and nursing school curriculums, including information on how to identify the signs and symptoms of cognitive impairment, risk factors for dementia, pharmacological and non-pharmacological treatment options, the impact of dementia on caregivers and families, and why participation in clinical studies is so important. These efforts will help to make referral to and participation in clinical studies part of the norm, not the exception.

- ❖ *Improve access to clinical trials and other studies.* Many countries list current opportunities to participate in dementia clinical trials and other studies in public online databases. This assumes the general public understands the trial enrollment process and puts the onus on them to figure out how to participate. To address this issue, governments can work with Alzheimer's disease and dementia charities to improve information and outreach to persons with dementia and their caregivers. Alzheimer's and dementia charities worldwide play an important role in educating their staff, volunteers and clients about the importance of participation in clinical trials and studies. For example, in Canada, the Alzheimer Society of Canada is developing the *Clinical Trial and Study Recruitment: A Guide to Get Started* (available early 2015) to ensure volunteers interested in clinical trials and other studies are informed on how they can participate. Governments can also shift the burden of finding suitable investigations by supporting matching services for dementia clinical trials and other studies. Clinical trial matching services provide personalized assistance for study volunteers to submit their information in a single, central location, and then be presented with simple descriptions of studies they may match with, along with contact information for the study teams. In the United Kingdom, the Department of Health is funding an approach like this in England called *Join Dementia Research*.ⁱⁱ The service is being delivered in a partnership with the National Institute for Health Research (NIHR), Alzheimer's Research UK and the Alzheimer's Society. In the United States, the Alzheimer's Association offers *TrialMatch*[®],ⁱⁱⁱ a free, individualized clinical studies matching service for persons with dementia, their caregivers, healthy volunteers and physicians with current studies. Since its debut in July 2010, *TrialMatch*[®] has helped over 85,000^{iv} individuals find information on clinical studies based on their diagnosis, preferences and locations. Lastly, governments can encourage

ⁱⁱ *Join Dementia Research*, www.joindementiaresearch.nihr.ac.uk.

ⁱⁱⁱ *Alzheimer's Association TrialMatch*[®], alz.org/trialmatch.

^{iv} Number is as of October 2014.

investigators to help ease the burden of study partner participation by offering simple solutions such as paying for travel costs to trial sites or covering the costs of child care or other care duties during study visits. Taking into consideration the extra commitment and heavy burden for the patient and caregiver unit in dementia studies, regulatory agencies could also examine and facilitate alternative structures of compensation to encourage study participation.

- ❖ *Establish national ethic or institutional review boards (IRB).* Forming a central IRB for neurodegenerative diseases, including Alzheimer's, would increase the efficiency of initiating large, multi-center clinical trials while improving the protection of human volunteers involved with them. Country governments can streamline infrastructure and create efficiencies by establishing a central IRB for all clinical trial sites within their borders. For example, the National Cancer Institute (NCI) at the U.S. National Institutes of Health has a Central IRB (CIRB) Initiative, which expedites the enrollment process for NCI-sponsored studies.²³ The National Biomedical Research Ethics Council (NBREC) is working in partnership with advocacy organizations, academia and industry to support the coordination of such efforts for neurodegenerative disease research in North America.²⁴

- ❖ *Harmonize and collaborate on regulatory efforts.* In addition to simplifying regulatory requirements such as IRBs in their own nations, governments can coordinate regulatory requirements across countries to support multi-center clinical trials. Consensus by different regulatory agencies to determine what clinical measures are required will reduce the number of trials necessary and streamline the drug development process. Governments can also improve understanding of regulatory science by collaborating with stakeholders to foster expertise and address key issues. For example, the U.S. Food and Drug Administration (FDA), the Alzheimer's Association and the Reagan-Udall Foundation (RUF) have created a two-year fellowship at the FDA Center for Drug Evaluation and Research's Division of Neurology Products to nurture partnerships and address obstacles in the development of new treatments for Alzheimer's disease and other neurodegenerative disorders.²⁵ Vehicles like the Alzheimer's Association Research Roundtable also provide a platform to convene multiple regulatory perspectives with scientists from around the world to collectively discuss challenges to dementia research and development.²⁶

- ❖ *Support public-private partnerships.* Country governments can further support dementia research by participating in collaborative, pre-competitive efforts to standardize methods of data collection and analysis. For example, public and private partners in the World Wide Alzheimer's Disease Neuroimaging Initiative (WW-ADNI) have been developing standardized methods for data collection in clinical studies and sharing data across the network.²⁷ Likewise, members of the Coalition Against Major Disease's (CAMD) pre-dementia Clinical Outcomes Assessment (pCOA) task force are working together to advance a clinical outcome assessment tool for use in clinical trials of mild cognitive impairment (MCI) and early stage Alzheimer's disease.²⁸ To adequately capture participant input, the Cognition Working Group of the Critical Path Institute's (C-Path) Patient Reported Outcomes (PRO) Consortium is in the process of identifying an instrument to assess patients' perspectives by those with mild cognitive impairment (MCI) for use in clinical trials.²⁹ And the Global Biomarker Standardization Consortium (GBSC) is working with researchers, clinicians, industry, regulatory and government leaders to achieve consensus on the best ways to standardize and validate biomarker tests for use in clinical practices around the world.³⁰ GBSC's projects include a collaboration with the European Alzheimer's Disease Consortium (EADC) and ANDI on a harmonized protocol for hippocampal volumetry; and work with the Institute for Reference Materials and Measurement (IRMM) and the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) on the development of international reference materials for cerebrospinal fluid (CSF) Alzheimer's disease biomarkers. Regulatory bodies can help to validate common methodologies and share findings broadly across open data networks, which will ultimately inform and ease the development of future dementia clinical trials and other studies.

- ❖ *De-risk the drug development process.* Governments should evaluate intellectual property and market exclusivity issues in their countries to address industry challenges in drug development and commercialization. Regulatory bodies should also evaluate and provide, to the safest extent possible, expedited review processes for new research discoveries for neurodegenerative diseases, including Alzheimer's. The U.S. FDA has developed mechanisms to "fast track" programs for serious diseases³¹ and has drafted guidance for early-stage dementia research.³² Government agencies in other countries can develop similar expedited regulatory frameworks. Mitigating risk in patent protections and shortening the drug

development timeline will encourage biopharmaceutical companies to continue pursuing innovations without risking public safety.

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