Dementia Innovation Readiness Index

2018

As life expectancy rises across the globe, the burden of dementia will increase significantly. This is especially true in developing countries, which will be home to nearly 70% of people with dementia by 2050, up from 58% today. In recognition of this trend, the Global Coalition on Aging (GCOA) and Alzheimer's Disease International (ADI) focuses our 2018 Dementia Innovation Readiness Index on Argentina, Brazil, China, and India, as well as Saudi Arabia in recognition of its upcoming leadership of the G20 in 2020.

In 2017, we released the first edition of the Dementia Innovation Readiness Index – the result of an ambitious project to survey and analyze countries' readiness to develop and implement innovative dementia solutions across G7 countries.

Many of our findings from the G7 are equally relevant to the countries evaluated this year: Public leadership and funding for dementia innovation is insufficient, early diagnosis of dementia is not prioritized, and access to high-quality care is limited. But, for the countries we studied in this report, each of these shortcomings is compounded by additional challenges - economic disparity, geographic limitations, and in some cases, achieving human development goals.

The Index identifies specific challenges within each of the five countries as well as opportunities to promote innovation in the treatment and prevention of dementia and care for people and families impacted by the condition. Our findings are based on a series of expert interviews and a rigorous analysis of available data sources, and we are immensely grateful to the many people who contributed their time and insights.

We hope you will use the Index findings and recommendations as a tool to support advocacy, research, and public policies that can help alleviate the burden of dementia, and we welcome your feedback and sharing of best practices to accelerate this process.

Over the coming years, GCOA and ADI intend to expand the Index to cover all G20 countries. As we do so, we will continue to monitor progress in the countries we have studied and work to hold leaders accountable for fostering innovation readiness to improve the lives of people with dementia and their families.

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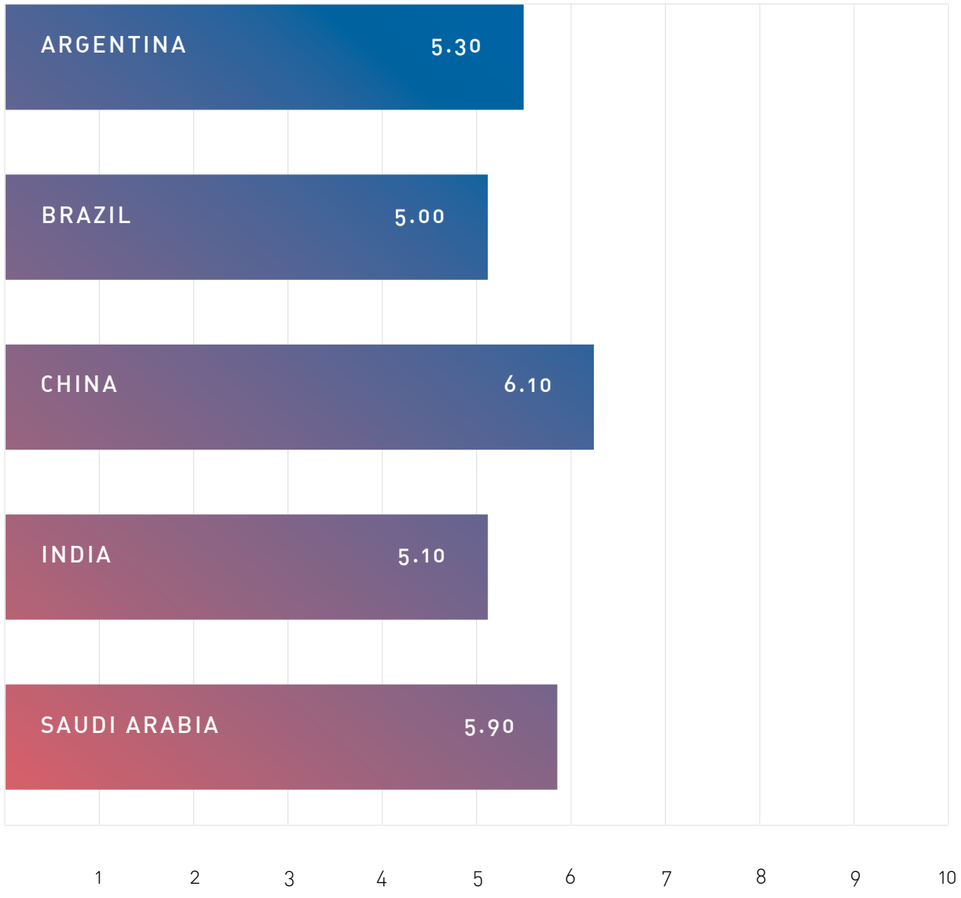
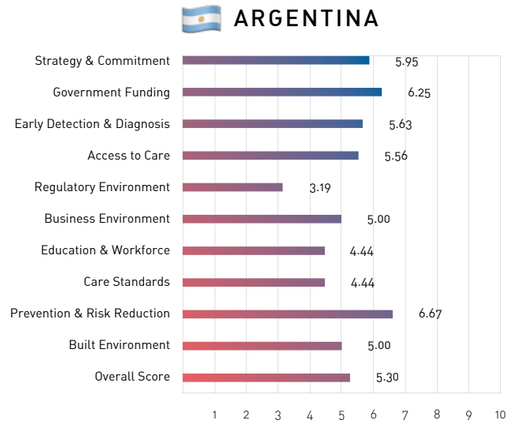
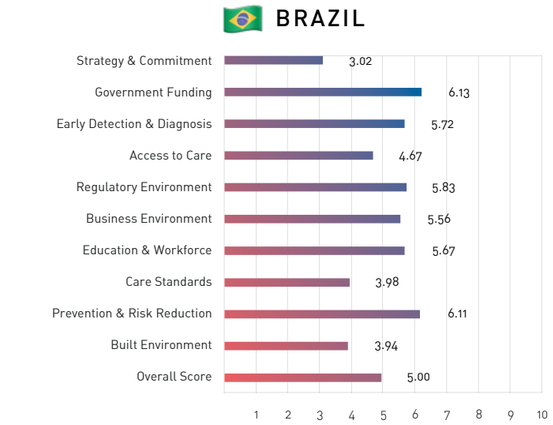
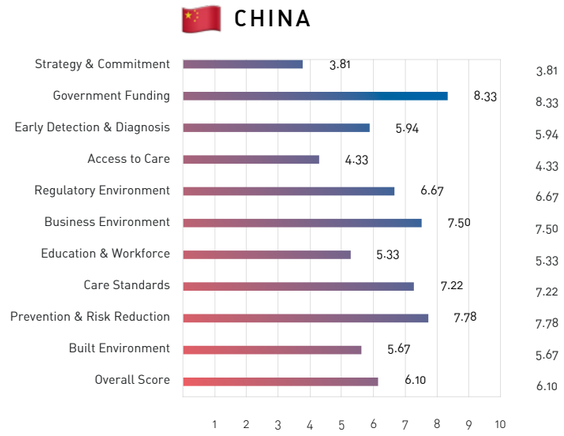
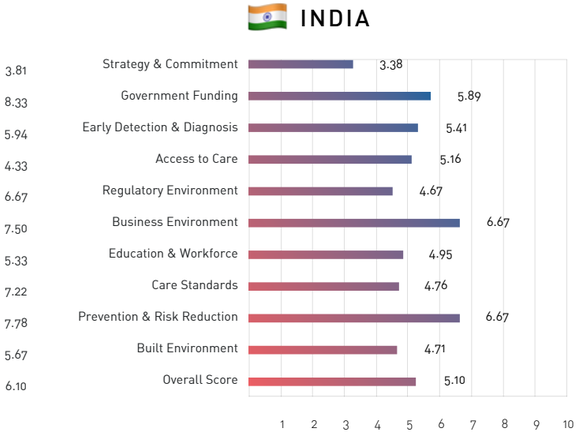
Below is a snapshot summarizing our overall findings on dementia innovation readiness in each of the five countries studied this year: Argentina, Brazil, China, India and Saudi Arabia. The snapshot is followed by more detailed category-specific findings. Further information about each country's response to dementia can be found in the report's detailed findings, which follow this executive summary and are accessible at www.alz.co.uk and www.globalcoalitiononaging.com

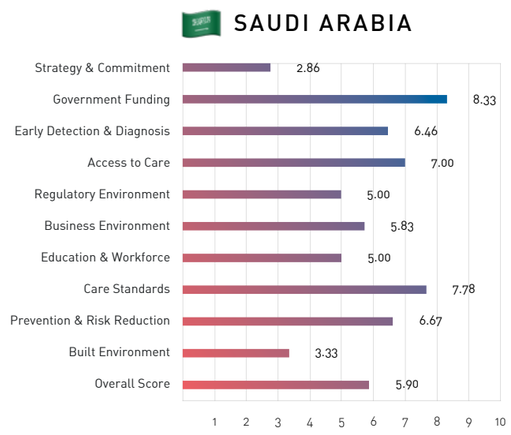












Executive Summary: Innovation Category Findings

STRATEGY & COMMITMENT

Key Findings
Several of the five countries studied have started to address the challenges presented by rapidly aging populations, but dementia is not yet a focal point for most.

Some regional and local governments outpace their national governments in prioritizing and responding to dementia.

Non-governmental organizations, universities, and non-profits are helping fill the leadership gap left by government.

In countries with areas of extreme poverty, the top government priority is achieving basic human development goals, crowding out attention on dementia.

Call to Action
Countries must create and implement dementia plans, which are critical to aligning priorities and enabling innovation.

GOVERNMENT FUNDING

Key Finding
Government funding for dementia research and care is relatively low and not focused on discovering innovative solutions for dementia.

Call to Action
Governments must develop comprehensive funding strategies for dementia research that prioritizes innovation.

EARLY DETECTION & DIAGNOSIS

Key Findings
Under-diagnosis of dementia is a significant challenge in the countries studied.

Low awareness of dementia among health care providers and the general public delays detection, diagnosis, and treatment.

Countries do not have adequate systems to track dementia diagnoses, share information among health care providers, and optimize patient care.

Due to distrust, lack of information, and under-diagnosis, people with dementia are not effectively recruited into clinical trials.

Call to Action
Stakeholders must raise awareness of dementia across society to promote timely diagnosis and access to care.

ACCESS TO CARE

Key Findings
Geography and economic status dictate an individual's ability to access high-quality care.

In traditional societies, caregiving is typically considered a familial duty rather than utilizing professionals with specialized training and expertise.

Call to Action
Governments, payers, and providers must establish care pathways that help people with dementia receive appropriate support from skilled caregivers as the condition progresses.

REGULATORY ENVIRONMENT

Key Finding
Regulators in the five countries studied generally support the findings of the U.S. Food and Drug Administration (FDA) and the European Medicines Agency (EMA).

Call to Action
Governments must fund regulatory agencies to ensure the timely approval of therapies introduced in other markets.

The patient voice should be better integrated into the drug review process.

BUSINESS ENVIRONMENT

Key Finding
There are currently few incentives for the private sector to invest in developing innovations and overcoming access barriers.

Call to Action
Stakeholders should improve the market environment in all countries to support private-sector investment in innovative solutions.

The private sector can catalyze technological innovation, including data sharing and medical records platforms, which will be an essential tool to improve dementia diagnosis and care.

EDUCATION & WORKFORCE

Key Findings
Health care education and workforce training includes limited availability for geriatric training programs and little dementia-specific training.

There is a missed opportunity to fully utilize non-physician professionals to provide dementia-related care and services.

Call to Action
Geriatrics, including information on dementia, should become an essential aspect of training for all medical providers, health care service providers, and related professionals.

CARE STANDARDS

Key Finding
Even where governments have implemented care standards, additional efforts are needed to improve the quality of dementia care.

Call to Action
Governments should support rigorous standards and innovative funding models to improve access to high-quality care specifically for people with dementia.

PREVENTION & RISK REDUCTION

Key Findings
As national populations age, dementia is an increasingly critical element of public health surveillance – but data remains limited in the reviewed countries.

Raising awareness will be the foundation of innovation readiness in the countries studied.

Call to Action
Risk reduction strategies for dementia should be integrated into broad or multi-condition health campaigns.

BUILT ENVIRONMENT

Key Finding
Mobility options, a key part of community living support, are limited for people with dementia.

Call to Action
Stakeholders should support the creation of dementia-friendly communities to support independence and community living.

Framework

The Dementia Innovation Readiness Index was created based on primary and secondary data sources collected and analyzed by the Global Coalition on Aging (GCOA) and Alzheimer's Disease International (ADI). The primary data sources consist of interviews and surveys with global key opinion leaders and subject matter experts (including scientists, advocates, regulators, researchers, caregivers, and business leaders, representing thousands of stakeholders in the fight against the diseases that cause dementia), as well as expert input from GCOA and ADI members. The secondary data sources consist of existing research gathered from global authorities including ADI and the World Health Organization (WHO). A full list of data sources can be found in Appendix C.

In order to measure innovation readiness, the Index aims to uncover and clarify the following:

- Where innovation in dementia is currently occurring;
- The enablers of innovation in prevention, treatment, and care; and
- The barriers to innovation in prevention, treatment, and care.

To that end, the Index evaluates dementia innovation across 10 categories:

- Strategy & Commitment
- Government Funding
- Education & Workforce
- Early Detection & Diagnosis
- Regulatory Environment
- Access to Care
- Prevention & Risk Reduction
- Business Environment
- Care Standards
- Built Environment

Each category consists of a set of indicators (a total of 48), according to which each category is scored. The categories and indicators were developed based on insights from existing indices measuring innovation in other sectors and an assessment of the current dementia innovation landscape. Though important innovations are occurring globally in dementia, the scope of this index is five G20 countries: Argentina, Brazil, China, India, and Saudi Arabia. This methodology was first developed in 2017 and will be applied to evaluate the innovation readiness of other countries in future indices.

Scoring

Scores were generated from surveys and interviews. Survey respondents were asked to designate a score of one, two, or three in each indicator for one or several countries, based on the respondent's area of expertise. In interviews, scores on the three-point scale were derived based on qualitative inputs from subject-matter experts. Insights from the interviews have also informed the qualitative analysis in the Index.

GCOA and ADI scored each country's performance in each indicator on a three-point performance scale (see Appendix A for performance scale) based on our combined analysis of qualitative and quantitative data, with a three representing high performance, a two representing moderate performance, and a one representing low performance.

Calculations

Category Scores

A country's category score represents the sum of its scores for that category's indicators, as a percentage of the total possible score that could be achieved.

TOTAL CATEGORY SCORE CALCULATION

$$\frac{\text{Sum of scores across all indicators}}{\text{Total possible score}} \times 10$$

Category Weight

In addition to determining each country's performance, the Index weights each category based on its relative importance as a driver of dementia innovation.

Weighting for the categories is based upon input from survey and interview participants, who were asked to rate each category on a ten-point scale, with 10 signifying high importance for driving innovation, and one signifying low importance. The average score for each category determines that category's weight.

WEIGHT CALCULATION

$$\frac{\text{Sum of category weighting scores}}{\text{Total number of category's weighting score inputs}}$$

Weighted Country Scores

Finally, the Index combines each country's category scores and each category's innovation weight to measure a country's overall performance in advancing innovation in dementia treatment, prevention, and care.

Each **weighted country score** is derived by adding all weighted category scores for that country and dividing that sum by the total **possible weighted country score**.

TOTAL WEIGHTED COUNTRY SCORE

$$\frac{\text{Sum of country's (category score x category weight)}}{\text{Total possible weighted country score}}$$

Detailed Findings

The 2018 Dementia Innovation Readiness Index describes the current dementia landscape in five of the G20 countries: Argentina, Brazil, China, India, and Saudi Arabia. It highlights the enablers driving progress in dementia treatment, prevention, and care as well as the barriers preventing innovation.

For each category, countries that performed in the 75th percentile for a given indicator are labeled green, countries below the 25th percentile for a given indicator are red, and countries between the 25th and 75th percentile for a given indicator are represented in yellow. In a few cases, indicators are left blank when no data was available.

Through our assessment of these enablers and barriers, we identified opportunities to promote dementia innovation readiness. On the following pages, we summarize our key findings and recommendations across each of the 10 categories.

Strategy & Commitment

KEY FINDINGS

Several of the five countries studied have started to address the challenges presented by rapidly aging populations, but dementia is not yet a focal point for most. Argentina is the only country among the five with a dementia plan in place. Others are stepping up their focus on aging issues generally but have yet to identify dementia as a highest-priority health issue. For example, India has established a National Program for Health Care of the Elderly, which aims to improve quality and access to care for older people.[1] Similarly, experts report that Saudi Arabia's Vision 2030 will include a health care plan for older adults. Age-related strategies like these typically include some discussion of dementia but fall short of addressing the impact on the health system or society.

Not surprisingly, countries with younger populations are less focused on aging and dementia – yet they have the greatest opportunity to proactively manage the condition's inevitable toll. Among the countries profiled this year, the 65+ population is highest in Argentina at 11.6%[2] and lowest in Saudi Arabia at 3.3%.[3] In comparison, 17.9% of the G7 countries' population is over 65.[4]

> "There have been some notable efforts over the past decade to make Alzheimer's a priority in Argentina. But when politicians or administrations change, our strategy goes back to step one."
>
> FERNANDO TARAGANO
>
> **Vice President of Scientific Committee**
> Asociación Lucha contra el Mal de Alzheimer y Alteraciones semejantes de la República Argentina

Some regional and local governments outpace their national governments in prioritizing and responding to dementia. For example, in several provinces and cities where the local populations are older than the national average, such as Tucumán, Argentina, and Kerala, India, local authorities established dementia support programs and enacted local dementia plans. Local action can galvanize a broader response and provide immediate help for people with dementia. However, experts report that without the full commitment of a national government, there is insufficient access to high-quality treatment and care and minimal support for developing innovative responses to dementia.

Third-party organizations are helping to fill the leadership gap left by government. None of the countries profiled have established strong national leadership on dementia. However, national Alzheimer's associations, university researchers, and other third-party organizations are playing a critical role in helping those with dementia while advocating for a stronger government role.

🇮🇳 INDIA

Kerala offers a model for local action
Kerala is one of the most elderly states in India. In the absence of a national dementia plan, the state government teamed up with the Alzheimer's and Related Disorders Society of India to develop and implement the Kerala State Initiative on Dementia to better serve those with the condition.

The initiative focuses on five pillars: (1) awareness, (2) services, (3) day care centers and residential care, (4) specialist care, and (5) palliative care.[5]

Notable accomplishments include opening a residential dementia care center, a day care center, starting a dementia friends program, and raising awareness of the importance of early diagnosis.[6] Other states have reportedly expressed interest in replicating Kerala's model.

	ARGENTINA	BRAZIL	CHINA	INDIA	SAUDI ARABIA
Visible, continuous political leadership	🟡	🟡	🟢	🟡	🟡
Presence of national dementia plan	🟡	🔴	🔴	🔴	🔴
Implementation of national dementia plan	🔴	🔴	🔴	🔴	🔴
Efficacy of national dementia plan in creating engagement	🟡	🔴	🔴	🔴	🔴
Monitoring and evaluation of national dementia plan	🟡	🔴	🔴	🔴	🔴
Commitment to dementia-friendly communities	🟡	🟡	🟢	🟡	🟡
Private sector or NGO leadership on dementia issues	🟢	🟡	🟢	🟢	🟡

In countries with areas of extreme poverty, the top government priority is achieving basic human development goals, crowding out attention on dementia. Health care, clean water, sanitation, and the eradication of hunger and poverty must come first, but leaders cannot afford to ignore the growing needs of people with dementia.

CALL TO ACTION

Countries must create and implement dementia plans, which are critical to aligning priorities and enabling innovation. Plans drive funding for research, promote preventive solutions, and improve care services. Of the countries reviewed, only Argentina has a national dementia plan in place. The program is led by Programa de Atención Médica Integral (PAMI), the Argentine agency responsible for elder care, but is not currently being implemented due to lack of funding. The state of Kerala, India, launched a dementia plan with the Alzheimer's and Related Disorders Society of India.[7] National dementia plans offer an opportunity to improve innovation readiness and should be widely embraced.

🇦🇷 ARGENTINA

Official government support for dementia has yet to coalesce
Establishing sustained political leadership on dementia at the national level has been a challenge for Argentina. Current and past health ministers reportedly see dementia as a priority, but their individual interests have not translated to a broader, sustained commitment from the government.

Experts report that in 2017, the Mental Health Directorate urged Congress to establish a Special Directorate in Neuro-Cognitive Disorders. Congress should urgently act upon this recommendation and create a permanent leadership position on dementia.

Government Funding

KEY FINDING

Government funding for dementia research and care is relatively low and not focused on discovering innovative solutions for dementia. Even in countries where funding for dementia research is on the rise, the investment is not commensurate with the need. Today, governments might fund basic research to understand dementia prevalence or diagnosis rates. However, few were reported to prioritize funding innovative research, treatments, and care delivery models. Besides increasing the amount and nature of funding, countries also need to ensure they have a skilled workforce capable of researching novel treatments and interventions as well as providing care for those with dementia.

CALL TO ACTION

Governments must develop comprehensive funding strategies for dementia research that prioritizes innovation. While some government agencies – India's Council of Medical Research, for example – do provide limited support, these funds tend to be allocated in a patchwork fashion. A unified funding strategy that prioritizes innovative research into basic and translational science, prevention, and care would help direct countries' responses to dementia and ensure that people with the condition receive the support they deserve.

The countries studied could benefit from greater utilization of nontraditional funding mechanisms like public-private partnerships that leverage government funding to promote innovation. Best-practice examples include the United States' Critical Path Institute and Europe's Innovative Medicines Initiative (IMI). IMI is jointly funded by the European Commission and the European Federation of Pharmaceutical Industries and Associations. It funds drug discovery projects with an emphasis on areas of "unmet medical or social need."

	ARGENTINA	BRAZIL	CHINA	INDIA	SAUDI ARABIA
Change in overall R&D funding	🟨	🟨	🟨	🟨	🟨
Change in government funding for dementia research and care	🟨	🟨	🟩	🟨	🟩
Incentivizing public-private partnerships	🟥	🟥	🟨	🟥	🟨
Government prioritization of innovative research, treatments, and care	🟥	🟨	🟨	🟥	🟨

BRAZIL

Model for universal distribution of treatment could expedite integration of innovations into the health care system

Experts report that the Brazilian government funds universal distribution of anticholinesterases to people diagnosed with mild to moderate dementia. However, because dementia in Brazil is under-diagnosed – it is estimated that only 23% of Brazilians with the condition receive a proper diagnosis – not everyone can access these treatments.[8] Still, Brazil's distribution system could help to pave the way for universal distribution of innovative treatments in the future, especially if paired with an effort to encourage diagnostic testing for dementia.

SAUDI ARABIA

Shortage of well-trained researchers

Government funding for R&D is, in general, on the rise in Saudi Arabia. Experts also report an increasing amount of funding for research into cognitive diseases, including dementia and its behavioral side effects. However, this funding is frequently left on the table because Saudi Arabia lacks a well-developed research infrastructure and workforce that might put these funds to good use. Today, Saudi Arabia has 2,200 physicians in training programs. It aims to nearly double that number by 2020.[9] New training programs for physicians could be an opportunity to help prepare Saudi Arabia's workforce to tap into research funding opportunities.

Even in countries where funding for dementia research is on the rise, the investment is not commensurate with the need.

Early Detection & Diagnosis

KEY FINDINGS

Under-diagnosis of dementia is a significant challenge in the countries studied. Only a few countries have diagnosis rates publicly available, and those diagnosis rates are rarely accurate. In Brazil, for example, it's estimated that 77% of cases of dementia are undiagnosed.[10] In India, as many as 90% of cases of dementia are reported to be undiagnosed.[11]

Low awareness of dementia among health care providers and the general public delays detection, diagnosis, and treatment. People may put off visiting their health care provider because they equate dementia with normal age-related cognitive decline. A general practitioner (GP) may lack the training to recognize dementia, and many doctors do not have access to advanced technologies that would enable diagnosis. Even in countries where advanced technologies exist, access is unevenly distributed.

> "We've seen some potential in training community health workers to recognize the symptoms of dementia and provide a referral. Training community health workers should be fully assessed, and if it's found to be effective, implemented across the country"
>
> CLEUSA FERRI
>
> **Professor at the Post-Graduation Program**
> Department of Psychobiology,
> Universidade Federal de Sao Paulo

In Argentina, for example, researchers began to introduce PET scans in 2008-2009, but the tests are generally only available to those living in Buenos Aires and only administered by a small number of specialists. This means the only way to tell if a patient has dementia is to monitor his or her symptoms and provide a diagnosis as the condition deteriorates. And, when a GP finally makes a referral to a specialist, there's often a long wait for an appointment – especially for people who live in rural areas.

Countries do not have adequate systems to track dementia diagnoses, share information among health care providers, and optimize patient care. In China and Saudi Arabia, for example, each hospital operates on its own without a centralized data repository of patient information, including relevant diagnoses. As countries work to increase diagnosis rates, it will be critical to create a data infrastructure that allows for providers to share information. Further, countries without information sharing systems run the risk of being unable to adequately provide high-quality, uninterrupted care for people with dementia even if they move between geographic locations or providers.

Due to distrust, lack of information, and under-diagnosis, people with dementia are not effectively recruited into clinical trials. Older people in the countries studied may be hesitant to take new, unapproved drugs and often maintain the misperception that trials are being used to experiment upon people, rather than to develop innovative treatments for dementia. Under-diagnosis of dementia further constrains clinical trial recruitment, as it is hard for companies to recruit enough people who meet the trial protocols. One bright spot is in Argentina, where recruitment for clinical trials is reportedly becoming easier due to a history of collaboration between universities, the pharmaceutical industry, and other organizations working to cure Alzheimer's disease and related dementias.

CALL TO ACTION

Stakeholders must raise awareness of dementia across society to promote timely diagnosis and access to care. Early diagnosis is also critical to enabling access to disease-modifying treatments, which evidence shows are most effective when used in the early stages. Experts pointed to several strategies for promoting early diagnosis: promoting awareness of the condition, creating more and better training opportunities for health care providers, and establishing data-sharing systems that enable providers to track diagnoses.

Perhaps the most pivotal challenge to promoting diagnosis is that dementia is frequently conflated with normal aging. In China, for example, dementia directly translates as, "stupid, demented elderly."[12] Because people with dementia and their families are unaware that the condition is not part of normal aging, they do not always seek help at an appropriate time. Even when people do seek help, health care providers might not be prepared to give a diagnosis due to a lack of training, a hesitancy to misdiagnose, and a shortage of advanced technologies that make it easier to confirm dementia.

	ARGENTINA	BRAZIL	CHINA	INDIA	SAUDI ARABIA
Effort by stakeholders to increase rates of detection and diagnosis	🟨	🟨	🟨	🟨	🟨
Presence of reliable, publicly available diagnosis rates	🟥	🟥	🟥	🟥	🟥
Cognitive assessment included as part of elderly medical/social care	🟩	🟨	🟩	🟨	🟩
General practioners (GPs) able to diagnose and treat dementia	🟨	🟥	🟨	🟥	🟨
Sufficient training and professional support for GPs to recognize, evaluate, and diagnose dementia	🟥	🟥	🟥	🟥	🟨
Access to GPs	🟩	🟩	🟩	🟩	🟩
Access to specialists capable of providing advanced diagnostics	🟥	🟨	🟨	🟨	🟨
Ability of research centers to recruit and execute clinical trials	🟨	🟩	🟨	🟨	🟨

INDIA, BRAZIL, CHINA

Training for community health workers aids early detection

In Kerala, India, as part of the state dementia plan, maternal and child health care workers who make home visits have been trained to identify people with potential cognitive impairments. Similarly, in Brazil, a small number of community health workers have been trained to identify potential cases of dementia. In both places, the community health workers provided referrals that resulted in a diagnosis over 60% of the time. These programs represent promising models for other countries.[13]

China is piloting the WHO Regional Office for the Western Pacific's toolkit for community-based dementia care, and experts say it is a useful tool for promoting early detection. The toolkit provides a care model and training for community workers working in low- and middle-income countries.[14] It includes screening tools as well as best practices such as memory cafes, support groups, and public awareness campaigns.

Access to Care

KEY FINDINGS

Geography and economic status dictate an individual's ability to access high-quality care. From early diagnosis, through treatment, to end-of-life care, where a person lives has an outsized impact on his or her care. While those living with dementia in major metropolitan areas may have access to highly trained neurologists and advanced technologies, people living in certain rural or impoverished areas must make do with a lower quality of care. Of course there is variability in policies across regions, yet national policies have yet to adequately address the rising care needs that come with an aging population.

In China and India, respectively, 43% and 67% of individuals live in rural areas where access to high-quality care is reported to be limited.[15] As a point of comparison, in the G7 countries, on average only 19% of individuals live in rural areas.[16]

Even for those living in urban areas, economic disparity has a significant impact on access to care – especially long-term care. Publicly funded long-term care facilities are often characterized by lengthy admission wait times, discriminatory policies that make it difficult for people with dementia to receive care, and low quality of care. While private care facilities often provide a higher quality of care, the high cost can be a barrier for many.

In traditional societies, caregiving is typically considered a familial duty, rather than utilizing professionals with specialized training and expertise. This was raised by experts in China, India, and Saudi Arabia where most care for people with dementia is provided by untrained family members or low-paid domestic workers who are not trained to provide care for people living with dementia. Moreover, experts report that stigma surrounds issues of family caregiving. For example, in China daughters who want to work rather than stay at home are frequently criticized, and in India family caregivers who seek training are perceived as not loving their relative enough to provide an adequate level of care. For those family caregivers interested in training, common barriers include a lack of programming and high costs.

CALL TO ACTION

Governments, payers, and providers must establish care pathways that help people with dementia receive appropriate support from skilled caregivers as the condition progresses. Especially within developing countries, when individuals are diagnosed with dementia, they are rarely provided with a care plan or adequate tools and resources to help them manage their condition. This can be due to multiple factors, ranging from a health care provider's general lack of awareness of how to address the condition to structural issues in the health care system. Innovations are needed to establish an uninterrupted, standardized continuum of care for people with dementia.

Ideally, countries should have systems in place that enable high-quality care to start in the home and be provided by trained family members and/or professional caregivers. As the condition progresses, people with dementia must be able to access high-quality long-term care – at home, in community day care programs, or in residential care facilities with skilled caregivers. Both the lack of appropriate facilities and the shortage of trained personnel present barriers today. In China, for example, some institutions have informal policies preventing people with dementia from moving in because they lack staff who are trained to manage the condition.[17]

	ARGENTINA	BRAZIL	CHINA	INDIA	SAUDI ARABIA
Access to post-diagnostic support	🟨	🟥	🟨	🟨	🟩
Access to in-home care (medical and non-medical)	🟨	🟨	🟥	🟨	🟩
Access to caregiver support (training for family caregivers, respite care, etc.)	🟨	🟥	🟥	🟥	🟨
Affordability and availability of assisted living and nursing homes	🟥	🟥	🟥	🟥	🟨
Assisted living and nursing homes well-equipped and staffed	🟨	🟨	🟨	🟨	🟨

CHINA

One-child policy leads to family caregiver shortage

Between 1979 and 2015, China's government imposed a family-planning policy barring couples from having more than one child. Care for the elderly in China is traditionally provided by family members, and many families now have one child who must deal with two aging parents and four aging grandparents. To begin addressing the pending care crisis, the Chinese government is working to keep care in the home and community, as institutional care is costly and economically unsustainable.[18] Recently, experts report that the government published guidelines that call for 90% of elder care to be provided in home, 6% in community-based care, and 4% in nursing homes. However, experts note that the Chinese government often sets in place policies that are not followed and suggest that the government's commitment to enacting these guidelines will clarify over the coming years.

SAUDI ARABIA

Regulations discourage investment in long-term care facilities

Only 3.3% of Saudi Arabia's population is currently over age 65.[19] This puts the country in a unique position to plan for a massive aging shift that will occur over the next 20 to 30 years. Today, experts report that long-term care facilities – known as "extended care homes" – are uncommon due to restrictive government regulations. The government reportedly considers extended care as a hospital setting and requires that facilities have a fully functional emergency department, intensive care unit, and radiology department. Because of the massive capital investment required to create a compliant facility, the private sector is reluctant to develop extended care homes.

Regulatory Environment

KEY FINDING

Regulators in the five countries studied generally support the findings of the U.S. Food and Drug Administration (FDA) and the European Medicines Agency (EMA). For example, the regulatory agencies of Brazil and China have set policies to help accelerate the review of treatments approved in the United States and the European Union. This sort of informal harmonization will help ensure that innovative treatments, once approved in a major market, will gain approval globally. At the same time, however, the experts interviewed were frustrated that government agencies were unable to act independently and promote policies in line with domestic priorities.

🇨🇳 CHINA

Streamlining approval of innovative therapies
In 2015, the China Food and Drug Administration updated its priority review policies to streamline the approval of innovative therapies.[20] Previously, priority review was available for innovative therapies that had not yet been approved in another market or for therapies that addressed an important unmet medical need – dementia was not included. Following the revision, China opened priority review for a wide range of drug categories – including geriatric drugs – and for foreign drugs manufactured in the United States or Europe and approved by the FDA or the EMA.[21]

Governments must fund regulatory agencies to ensure the timely approval of therapies introduced in other markets.
Experts report that regulators tend to follow the direction of global leaders in regulatory science such as the FDA and EMA, rather than establish country-specific policies. Following the lead of countries with greater capacity for regulatory sciences can be a good way for countries with smaller budgets to evaluate the efficacy and safety of innovative treatments. However, it is critical that policymakers adequately invest in regulatory agencies and their staffs so that as innovative treatments are approved abroad, they can be quickly made available to the public domestically.

The patient voice should be better integrated into the drug review process. None of the countries reviewed had formal structures in place to ensure that people with dementia advise on clinical trial design and outcomes that are important from their perspective. While some countries might have limited opportunities to comment upon new drug approvals – in Brazil, for example, online public inquiry is reportedly sought during the approval period – better integrating people with dementia into the development of drug guidelines specific to their diagnosed pathology would ensure that treatments adequately target the symptoms and outcomes that matter to them.

	ARGENTINA	BRAZIL	CHINA	INDIA	SAUDI ARABIA
Dementia regulation issues are clear and reflect latest scientific findings	🟥	🟥	🟥	🟥	🟥
Relevant regulatory bodies' willingness to drive innovation in regulatory science	🟨	🟨	🟩	🟨	🟩
Patient involvement in drug review process	🟨	🟨	🟨	🟥	🟥
Priority review - available for dementia	⬜	🟩	🟩	🟨	🟨

It is critical that policymakers adequately invest in regulatory agencies and their staffs so that as innovative treatments are approved abroad, they can be quickly made available to the public domestically.

Business Environment

KEY FINDING

There are currently few incentives for the private sector to invest in developing innovations and overcoming access barriers. In the countries reviewed, a significant urban/rural and socioeconomic divide limits access to cutting-edge services and care facilities, which negatively impacts the potential for private-sector investment and innovation. For example, Rio de Janeiro is a central hub for diagnostic and research infrastructure, but financial barriers prevent much of the population from accessing these services. Such access barriers deter private-sector investment from finding new solutions and reaching untapped markets. Without government incentives or a large population that can self-fund care, such as in Saudi Arabia, private-sector investment remains limited.

CALL TO ACTION

Stakeholders should improve the market environment in all countries to support private-sector investment in innovative solutions. While there are examples of public-private partnerships and financial incentives to attract private-sector investment, a comprehensive approach is needed to improve the business environment in the studied countries. There are some signs of progress: China has adopted measures that would provide government subsidies to NGOs to invest in care centers for older people,[22] and India has established tax relief mechanisms for care expenses that would reduce the financial burden on individuals and families.[23] However, a far more robust, multi-faceted approach is needed to create a business environment and market that fosters innovation in dementia.

In all of the countries reviewed, an increased role for the private sector can help bring new, needed solutions to dementia research and care. There is evidence of growing momentum in this area. For several decades, the Indian government has promoted a shift towards private-sector health care and medical education, with the private sector now delivering nearly 80% of out-patient care and 60% of in-patient care.[24] Some of the studied countries represent large pharmaceutical markets, and experts report that the industry is increasingly interested in these markets, including conducting clinical trials. Among all countries, a growing role for the private sector is a significant opportunity to develop and deploy innovations, particularly for the unmet needs of dementia. However, incentives to attract private-sector investment need to be further developed, implemented, and refined.

The private sector can catalyze technological innovation, including data-sharing and medical records platforms, which will be an essential tool to improve dementia diagnosis and care. In countries with significant economic and geographic barriers to accessing high-quality care, integrating technologies into the health system will be vitally important to address the needs of people with dementia. In the countries reviewed, research and care opportunities were largely limited to urban population centers and segments of the population that can afford to privately fund some or all aspects of care. Rural and poor populations often lack access to diagnostic tools, educational resources, and caregiving support, which indicates an opportunity for innovative technological approaches. However, fostering these innovations will require removing barriers to private-sector solutions in the health system.

	ARGENTINA	BRAZIL	CHINA	INDIA	SAUDI ARABIA
Government subsidies or tax incentives across disease areas	🟨	🟨	🟩	🟨	🟨
Patent protection - length and strength	🟩	🟨	🟩	🟨	🟩
Burden of government regulation	🟨	🟥	🟩	🟩	🟩
IP protection	🟨	🟨	🟨	🟨	🟨

Countries run the risk of underperforming in Global Competitiveness Index (GCI)
The World Economic Forum developed the GCI to rank how 137 global economies stack up against one another. GCI evaluates countries across a broad number of indicators including innovation across all sectors. Among the five countries evaluated in this report, not one ranked in the top 20.[25]

COUNTRY	OVERALL RANKING	INNOVATION RANKING
CHINA	27	28
SAUDI ARABIA	30	40
INDIA	40	29
BRAZIL	80	85
ARGENTINA	92	72

Education & Workforce

KEY FINDINGS

Health care education and workforce training includes limited availability for geriatric training programs and little dementia-specific training. While some countries have health care and medical training programs that focus on older people, these efforts are often limited and relatively new. For example, geriatrics-specific training programs are only just being established in Saudi Arabia, and in Brazil, the number of these programs is quite limited as well. In China, dementia is not included in the medical school curriculum,[26] which has been shown to reduce doctors' ability and willingness to diagnose and treat the condition.[27] Additionally, across the countries reviewed, geriatrics programs often struggle to recruit candidates, further reducing the number of specialists.

> "There are only 18 geriatric consultants in Saudi Arabia today. We're projected to reach 6 million elderly people in 2030 - there's no way that 18 specialists will be able to provide care for all of them."
>
> MOHAMMED BASHEIKH
>
> **Associate Professor & Consultant Internist & Geriatrician**
> King Abdulaziz University. Saudi Internal Medical Society, Saudi Geriatric Society

There is a missed opportunity to fully utilize non-physician professionals to provide dementia-related care and services. In the countries reviewed, many of the geriatrics programs are available only to physicians, with few options for nurses or other non-physician professionals. Experts also report that the level of training varies widely by geographic region and economic status. This is a missed opportunity to equip nurses and other professionals to provide and extend appropriate dementia care and assistance. For example, geriatric nursing is not a recognized specialty in India, which exacerbates a gap in workforce capabilities. While the country has several short-term programs to support elder caregivers in the private and public sectors, experts note that there is a relatively small number of these caregivers – leading to difficulty with hiring and retention. In Brazil, experts report that social workers have sufficient training to address dementia-related challenges – especially the legal issues surrounding dementia. But due to a lack of awareness about the role that social workers could play, they are not utilized to their highest potential.

CALL TO ACTION

Geriatrics, including information on dementia, should become an essential aspect of training for all medical providers, health care service providers, and related professionals. Multi-disciplinary care teams – including nurses, caregivers, social workers, and other non-physician professionals – can serve as a key resource to extend appropriate dementia care and services. For example, hospitals in Saudi Arabia and urban areas of Argentina have created successful multi-disciplinary care teams for older people, including people with dementia, by engaging a variety of health care professionals in geriatrics specialization. However, experts report that, in rural communities, a single doctor might be responsible for all aspects of patient care, without adequate training or non-physician support.

In some of the countries studied, concerted efforts and innovative approaches provide a model for how geriatrics training can be expanded. Brazilian geriatrics specialist societies, such as the Brazilian Society of Geriatrics and Gerontology, have led efforts to promote training in the field. Online tools, such as those in Argentina, have helped medical professionals to more easily engage in continuing education and knowledge-sharing. In addition to such voluntary professional training, geriatrics and dementia should be integrated into the core curriculum for all medical students, nurses, pharmacists, and other professionals. This approach would be one of the most effective ways to address the current shortfall of trained elder care professionals and meet the rapidly growing need.

	ARGENTINA	BRAZIL	CHINA	INDIA	SAUDI ARABIA
Availability of geriatric-specific training programs	🟨	🟨	🟨	🟨	🟥
Specialist saturation	🟥	🟥	🟥	🟥	🟥
Elder care specialty nurse saturation	🟥	🟥	🟥	🟥	🟥
Availability of ongoing training for elder care professionals	🟨	🟨	🟨	🟨	🟨
Integration of healthcare extenders (e.g., nurses, social workers, OTs) into dementia care pathway	🟨	🟨	🟨	🟨	🟩

SAUDI ARABIA

Saudi Arabia plans changes to the health system

The Saudi government has released a Vision 2030 statement, including a commitment to "better training to improve treatment for chronic diseases such as heart disease, diabetes and cancer that threaten our nation's health" and to improve "collaboration and integration between health and social care."[28] While dementia is not specifically discussed in the statement, experts noted an increased attention to the provision of geriatric training programs available to health care professionals.

PHYSICIAN SATURATION

Ranking the number of physicians working in country per 1000 people.[29]

ARGENTINA	3.9
CHINA	3.4
SAUDI ARABIA	2.5
BRAZIL	1.8
INDIA	0.76

Care Standards

KEY FINDING

Even where governments have implemented care standards, additional efforts are needed to improve the quality of dementia care. In a few of the countries reviewed, the national government has implemented quality measures in care settings such as hospitals and nursing homes. Saudi Arabia is exceptional in this area: the Ministry of Health has programs to improve geriatric care and home health care, and the sector is eager to embrace technology. However, in the other studied countries, experts express concern that care standards may be too low and not focused specifically on dementia, not adequately or consistently enforced, or face a financial disincentive because of the increased cost to public health systems. For example, while several Indian agencies provide certification of care standards, this certification is not mandatory. In Argentina, standards are largely related to care infrastructure, but do not cover care delivery. And in China, the government has adopted standards which are not uniformly implemented across care settings. Across all countries, limited funding and resources can constrain efforts to improve the quality of care.

CALL TO ACTION

Governments should support rigorous standards and innovative funding models to improve access to high-quality care specifically for people with dementia. Concerted efforts, including new funding models, are needed to improve the quality of dementia care, especially by expanding and refining pilots in the geriatrics space. India and China have invested in research grants to innovate care settings and practices in geriatric care, but there is little indication that these pilot approaches have been integrated or scaled into the national health system. While these programs would support the care of older people, they also need to be focused to support the specific needs of people with dementia. Overall, additional efforts are needed to ensure that care standards elevate quality of care and are supported by sufficient funding, enabling patient choice and accommodating a variety of needs and preferences. Further, national leadership to build countries' capacity for high-quality care will be a critical success factor, as this will require resources, training, and a commitment to awareness as the population with dementia continues to grow.

	ARGENTINA	BRAZIL	CHINA	INDIA	SAUDI ARABIA
Government implementation of quality measures					
Government support of innovative care services					
Presence of innovations in technology to improve care delivery					

Experts express concern that care standards may be too low and not focused specifically on dementia, not adequately or consistently enforced, or face a financial disincentive because of the cost to public health systems.

Prevention & Risk Reduction

KEY FINDINGS

As national populations age, dementia is an increasingly critical element of public health surveillance – but data remains limited in the studied countries. The selected countries have rapidly growing populations of older adults, which elevates the importance of reliable data regarding national rates of dementia prevalence, incidence, and mortality. However, this data is largely unavailable in the countries reviewed. Barriers include low rates of early, accurate diagnosis and a lack of health data interconnectivity, leading to information silos among facilities and providers. Some independent researchers and non-governmental organizations in India and Brazil have implemented measures to more accurately collect data on dementia, but the efforts are not expected to produce a national profile that encompasses the full impacts of the condition on populations or health systems.

Raising awareness will be the foundation of innovation readiness in the countries studied. There is currently low dementia awareness among national populations and policy-makers, who often believe that it is a normal part of aging and can be adequately addressed in general geriatric care settings. Additionally, there is little understanding of risk factors for dementia, which have not been included in public health messaging. However, organizations like the Alzheimer's and Related Disorders Society of India (ARDSI) and the Associação Brasileira de Alzheimer (ABRAz) are prioritizing public awareness, particularly prevention strategies that align with those of other non-communicable diseases. Such non-governmental organizations will play a key role in raising the public's dementia awareness and prompting calls to action.

CALL TO ACTION

Risk reduction strategies for dementia should be integrated into broad or multi-condition health campaigns. In countries around the world, public health campaigns focused on the prevention of non-communicable diseases have shifted attitudes and behaviors – but often failed to include dementia. On the other hand, campaigns focused only on dementia are sometimes ineffective. Experts note that efforts to launch public awareness campaigns regarding dementia in Argentina did not have the impact or dissemination into at-risk communities that had been expected. This indicates the potential for a variety of stakeholders to tie dementia into multi-condition health campaigns. The opportunity for health systems to reduce the incidence of dementia – and the associated costs – is significant; research estimates that reducing lifestyle risk factors could reduce worldwide dementia prevalence by a third.[30]

	ARGENTINA	BRAZIL	CHINA	INDIA	SAUDI ARABIA
Participation of dementia organizations in global NCD alliance	■	■	■	■	■
Dementia included in public health surveillance	■	■	■	■	■
Completion of lifestyle campaigns that address risk factors for dementia	■	■	■	■	■

> **"The projected rise of dementia in developing countries like India is overwhelming. So we're focusing on prevention efforts and raising awareness by including dementia in other public health campaigns and helping people understand that 'what's good for the heart is good for the brain.'"**

MEERA PATTABIRAMAN

Chairperson
Alzheimer's and Related Disorders Society of India

SAUDI ARABIA

Risk factors contribute to higher levels of dementia

Despite a relatively small older population, researchers at King Faisal Specialist Hospital and Research Centre found that the prevalence of MCI and dementia in Saudi Arabia (assessed using the Montreal Cognitive Assessment) were "in the upper range compared to developed and developing countries." Risk factors such as low levels of education, hypertension, and cardiovascular disease were thought to contribute to the finding.[31]

Research estimates that reducing lifestyle risk factors could reduce worldwide dementia prevalence by a third.

Built Environment

KEY FINDING

Mobility options, a key part of community living support, are limited for people with dementia. Mobility, including driving and public transit, supports the basic needs of people with dementia, such as daily errands and travel for medical appointments. It is also essential for participation in clinical trials. However, people with dementia face limited mobility options, particularly when driving becomes unsafe. Moderate accommodations have been made for older people on Indian public transit services, but there has not been a dedicated effort to make public transit accessible to people with dementia. In Argentina, travel to clinical trials is sponsored by pharmaceutical companies, offering one option for people with dementia to remain mobile to participate in research.

While mobility is just one piece of the puzzle when it comes to ensuring community participation and independence of people with dementia, it is an important marker towards embracing dementia-friendliness.

CALL TO ACTION

Stakeholders should support the creation of dementia-friendly communities to support independence and community living. Careful design and modifications to the built environment, as well as training for customer service professionals in public-facing sectors, can enhance engagement and mobility in addition to increasing awareness and shaping communities to understand and accommodate dementia. Reviewed countries can build on growing progress in this area. Some Indian states have deployed dementia-friendly community programs, and they are also exploring platforms for research participation that do not rely on access to transportation. In China, primary care is often provided in community health centers that are designed to be accessible to older people with limited mobility, though dementia diagnosis and treatment remain specialized and are not widely available.

Careful design and modifications to the built environment, as well as training for customer service professionals in public-facing sectors, can shape communities to understand and accommodate dementia.

	ARGENTINA	BRAZIL	CHINA	INDIA	SAUDI ARABIA
Presence of a support system in transportation for people with dementia	🟨	🟨	🟨	🟨	🟨
Availability of transportation options for people enrolling in clinical trials	🟨	🟨	🟨	🟨	🟨
Policy on driver's licenses	🟨	🟨	🟨	🟨	⬜
Consideration of dementia issues when planning and developing the built environment	🟥	🟥	🟨	🟥	🟥
Enacting dementia-friendly community principles on a local level	🟩	🟨	🟨	🟩	🟨

🇮🇳 INDIA

NGOs and local government drive dementia-friendly initiatives

In India, the Alzheimer's and Related Disorders Society of India (ARDSI) conducted 5 workshops on what dementia friendliness means in Trivandrum, Chennai, Bengaluru, New Delhi, and Cochin. Two hundred participants attended these workshops, including family caregivers, health and social care professionals, and members of the public.[32] Beginning in 2011, ARDSI and the city of Cochin have been working to make the city dementia-friendly through programs for children, dementia care informational sessions for students, and skills trainings for care home staff. Some individuals also trained to become dementia guides. [33]

Appendix A: Performance Scale

The scores for the Dementia Innovation Readiness Index are based on extensive survey research and secondary data. Survey respondents and interview subjects were asked to score their countries' performance for a set of indicators, based on their expertise. On the following pages is the performance scale that ADI and GCOA used to determine what scores to assign a country based on interview and survey responses.

CATEGORY	INDICATOR	SCORE OF 1	SCORE OF 2	SCORE OF 3
Strategy & Commitment	Visible, continuous political leadership	Not significant political leadership	There's some political will, but it is either just emerging or does not appear to be enduring	Strong political leadership
	Presence of national dementia plan	No plan at all	Non-governmental plan or strategy	Governmental plan
	Implementation of national dementia plan	There is no local, regional, or national strategy	There have been efforts to create a national strategy, but it has not been formalized by stakeholders	Plan has been officially adopted at the national level and is being widely implemented
	Efficacy of national dementia plan in creating engagement	There is little or no engagement as a result of the plan	There is limited engagement or a select group of stakeholders involved	Plan is engaging a broad range of stakeholders
	Monitoring, evaluation, and updating of national dementia plan	Strategy is rarely updated with progress tracked	Strategy is periodically updated with progress tracked	Strategy is updated regularly with progress tracked
	Commitment to dementia-friendly communities	No interest in dementia-friendly communities	There's been interest in dementia-friendly communities	Country has invested in and prioritized dementia-friendly communities
	Private sector or NGO leadership on dementia issues	The private sector and NGOs have provided minimal leadership on dementia issues	The private sector and NGOs have provided moderate leadership on dementia issues	The private sector and NGOs have provided strong leadership on dementia issues
Government Funding	Change in overall R&D funding	Total R&D funding has trended downwards	Total R&D funding has trended flat	Total R&D funding has trended upwards
	Change in government funding for dementia research and care	Government spending on dementia has decreased relative to inflation	Government spending on dementia has remained constant relative to inflation	Government spending on dementia has increased relative to inflation
	Incentivizing public-private partnerships	Government does not incentivize the development of public-private partnerships	Government moderately incentivizes the development of public-private partnerships, or only under specific conditions	Government strongly incentivizes the development of public-private partnerships
	Government prioritization of innovative research, treatments, and care	Government funding structure does not prioritize funding for innovative research, treatments or care	Government funding structure moderately prioritizes funding for innovative research, treatments or care	Government funding structure strongly prioritizes funding for innovative research, treatments or care

CATEGORY	INDICATOR	SCORE OF 1	SCORE OF 2	SCORE OF 3
Early Detection & Diagnosis	Effort by stakeholders to increase rates of detection and diagnosis	There has not been an adequate or formal effort by major stakeholders	There have been discrete efforts to increase detection and diagnosis	Strong national leadership has clearly demonstrated an effort to improve detection and diagnosis
	Presence of reliable, publicly available diagnosis rates	No diagnosis rates	Limited understanding of the rate of diagnosis	Diagnosis rates are available and reliable
	Cognitive assessment included as part of elderly medical/social care	Not included	Cognitive testing is included but limited	Cognitive testing is comprehensively included
	General practitioners (GPs) able to diagnose and treat dementia	GPs cannot diagnose or provide treatment	GPs have limited diagnostic ability	GPs can make a diagnosis and provide treatment easily
	Sufficient training and professional support for GPs to recognize, evaluate, and diagnose dementia	No		Yes
	Access to GPs	Accessing a GP is difficult and lengthy	There's a wait to access an individual's GP, but it's not difficult	People are able to reach their GP on demand
	Access to specialists capable of providing advanced diagnostics	Accessing a specialist is difficult and lengthy	There's a wait to access a specialist, but it's not too difficult	People are able to reach a specialist on demand
	Ability of research centers to recruit and execute clinical trials	It's nearly impossible to run and recruit for a clinical trial	There are some difficulties in recruiting and running clinical trials	Patients actively seek and doctors routinely refer people with dementia to clinical trials
Access to Care	Access to post-diagnostic support	Post-diagnostic support is limited or does not exist	Post-diagnostic support exists, but barriers to access exist	Post-diagnostic support readily exists
	Access to in-home care (medical and non-medical)	Low access to in-home care	Moderate access to in-home care	Access to quality, affordable in-home care is not difficult
	Access to caregiver support (training for family caregivers, respite care, etc.)	There is limited or no caregiver support available	There is access, however some barriers to utilizing services exist	There is access to quality, affordable caregiver support services
	Affordability and availability of assisted living and nursing homes	Assisted living and nursing homes are not available for dementia patients	Assisted living and nursing homes are available for some dementia patients	Assisted living and nursing homes are available and affordable for the majority of dementia patients
	Assisted living and nursing homes well-equipped and staffed	Assisted living and nursing homes are generally poorly equipped and staffed	There's a fair amount of variability in how well assisted living and nursing homes are equipped and staffed	Yes, assisted living and nursing homes are generally well equipped and staffed

CATEGORY	INDICATOR	SCORE OF 1	SCORE OF 2	SCORE OF 3
Regulatory Environment	Dementia regulation issues are clear and reflect latest scientific findings	No	In process of being updated	Yes
	Relevant regulatory bodies' willingness to drive innovation in regulatory science	No	Some officials have expressed willingness, but not across the regulatory body	Yes
	Patient involvement in drug review process	Patients are not included in the regulatory and review process	Patients are included in some level of the regulatory and review process	Patients fully included in the regulatory and review process
	Priority review - available for dementia	Priority review is unavailable for dementia	Priority review is available, but not for dementia treatments	Yes, priority review is available for dementia treatments
Business Environment	Government subsidies or tax incentives across disease areas	Government does not subsidize or provide tax incentives for private research	There are some subsidies or tax incentives for private research	Government widely subsidizes or provides tax incentives for private research
	Patent protection - length, and strength	Patents are not well protected	Patents have moderate protection	Patents are well protected
	Burden of government regulation	Performance of less than two in Global Competitiveness Report	Performance of two to three in Global Competitiveness Report	Performance of three or higher in the Global Competitiveness Report
	IP Protection	Performance of less than three in Global Competitiveness Report for intellectual property protection	Performance of three to five in Global Competitiveness Report for intellectual property protection	Performance over five in Global Competitiveness Report for intellectual property protection
Education & Workforce	Availability of geriatric-specific training programs	Low number of geriatric training programs	Moderate number of geriatric training programs	High saturation of geriatric training programs
	Specialist saturation	Low number of relevant doctors relative to the growing need	Moderate number of relevant doctors	High saturation of relevant doctors
	Elder care specialty nurse saturation	Low saturation of workers	Moderate saturation of workers	High saturation of highly trained workers
	Availability of ongoing training for elder care professionals	No		Yes
	Integration of health care extenders (e.g., nurses, social workers, OTs) into dementia care pathway	Poorly integrated	Moderately integrated	Well integrated

CATEGORY	INDICATOR	SCORE OF 1	SCORE OF 2	SCORE OF 3
Care Standards	Government implementation of quality measures	Quality measures are neither implemented nor being planned for	Quality measures are planned by government, but not yet implemented	Quality measures implemented by government to help improve health care outcomes
	Government support of innovative care services	No obvious evidence	The government has developed a limited effort to support care innovations	The government is actively driving care innovations
	Presence of innovations in technology to improve care delivery	There is not a clear effort around technology innovation	Use of technology is often discussed but few programs exist to encourage the development	Technology is a central focus for improved care delivery
Prevention & Risk Reduction	Participation of dementia organizations in global NCD alliance	Country's dementia association does not participate in non-communicable disease alliance		Country's dementia association participates in non-communicable disease alliance
	Dementia included in public health surveillance	No data is collected	Some data is collected, but is limited or of poor quality	There is regular data collection on dementia prevalence, incidence and mortality
	Completion of lifestyle campaigns that address risk factors for dementia	No lifestyle campaigns have launched that include dementia at this time	Lifestyle campaigns have been launched that include dementia, but as part of broader health messaging	Stakeholders have successfully launched lifestyle campaigns specifically related to dementia risk factors and awareness
	Availability of ongoing training for elder care professionals	No		Yes
	Integration of paramedical professionals into dementia care	Poorly integrated	Moderately integrated	Well integrated

CATEGORY	INDICATOR	SCORE OF 1	SCORE OF 2	SCORE OF 3
Built Environment	Presence of a support system in transportation for people with dementia	Little to no transportation options are open for people with dementia	Some transportation options are open for people with dementia	Transportation options are widely available for people with dementia
	Availability of transportation options for people enrolling in clinical trials	There are little to no transportation options available to people enrolling in clinical trials	There are some transportation options available for people enrolling in clinical trials	Transportation options are widely available for people enrolling in clinical trials
	Policy on driver's licenses	Lose driver's license automatically	Some procedures exist to evaluate continued ability to drive	Cognitive test once diagnosed is required
	Consideration of dementia issues when planning and developing the built environment	No, dementia is not widely considered when planning for and developing the built environment	Disabilities including dementia are considered when planning and developing the built environment	Yes, the built environment is specifically planned and developed to accommodate people with dementia
	Enacting dementia-friendly community principles on a local level	Almost no localities are working to enact the principles of dementia-friendly communities	A few localities are working to enact the principles of dementia-friendly communities	Many localities are working to enact the principles of dementia-friendly communities

Appendix B:
Secondary Data & Sources

STRATEGY & COMMITMENT

Data Point	Argentina	Brazil	China	India	Saudi Arabia
Presence of a national plan	Yes [34]	No plan [35]	No national plan, although dementia was acknowledged in National Mental Health Work Plan of China (2015-2020) [36 37]	No national plan, although a state plan in Kerala exists[38]	No national plan, although aging will be included in Vision 2030 plan
Implementation of national dementia plan	Plan is reportedly not funded	N/A	N/A	N/A	N/A
Commitment to Dementia-Friendly Communities	There are a small number of local efforts [39]	There are a small number of local efforts [40]	N/A [41]	There are a small number of local efforts [42]	N/A

GOVERNMENT FUNDING

Data Point	Argentina	Brazil	China	India	Saudi Arabia
Change in overall R&D funding	Increase approx. .2% since 2000 [43]	Yes, increase approx. .17% since 2000 [44]	Yes, increase approx. 1.225% since 2000 [45]	Yes, a 6.33% increase from 2016-2017; current 2017 R&D spending: $77.5 billion[46]	Increase from 2009: at .07% of GDP to 2013: at .82 % of GDP [47 48]

EARLY DETECTION & DIAGNOSIS

Data Point	Argentina	Brazil	China	India	Saudi Arabia
Presence of reliable, publicly available diagnosis rates	N/A	No reliable diagnosis rates are available – estimated that 77% of cases are not diagnosed [49]	N/A	No reliable diagnosis rates are available – estimated that 90% of cases are not diagnosed[50]	N/A
General practitioners (GPs) able to diagnose and treat dementia	N/A	Limited diagnostic ability[51]	Limited diagnostic ability[52]	No[53]	N/A[54]
Dementia specialist wait time/Advanced diagnostics	N/A	Lengthy wait time for specialists: Average of 2.08 years for those in the public system and 1.24 years for those in the private system[55]	N/A	N/A	Moderate wait time across healthcare system: Less than 40% receive appointments within 4 weeks [56]
Specialist availability for referral and diagnosis	Available in cities, but shortage in rural areas[57]	More availability in private services than public services[58]	Yes, but only at a few top hospitals[59 60]	Limited, "Indian Universities only train 387 new postgraduates annually in neurology and neurosurgery"[61]	Minimal and inadequate neurological and geriatric research programs available[62]

ACCESS TO CARE

Data Point	Argentina	Brazil	China	India	Saudi Arabia
Access to in-home care (medical and non-medical)	In-home care readily provided by families but rarely medical care[63]	Yes[64]	Long-term care provided often at home by family members but not government funded[65]	Professional in-home dementia care tested but not widespread; most dementia care is at home with family[66 67 68]	Minimal, for the rich; most people with dementia are taken care of at home by relatives[69]
Availability of assisted living and nursing homes	"Altogether, there are 70,000 LTC beds in the country, based in 600 facilities. Only 2.9 per cent of older persons live in LTC settings." [70]	Nursing homes exist mainly in large cities. A study registered 3,569 nursing homes, with only 6.6% funded by the government. Assisted living and long-term care are more family reliant as a result of Latin American cultural norm [71]	28,000 nursing home facilities with a total of approx. 7 million beds[72] The Chinese government remains largely uninvolved in financially supporting this sector[73]	Very minimal, approximately 22 available adept for dementia; general care at approx. 40,000 community hospitals (2015)[74]	Few nursing homes available and the few that exist are stigmatized for 'abandoned elderly' [75 76]

REGULATORY ENVIRONMENT

Data Point	Argentina	Brazil	China	India	Saudi Arabia
Relevant regulatory bodies' willingness to drive innovation in regulatory science	Moderate to poor but efforts are forthcoming to regularly improve regulatory practices[77]	Yes[78]	No[79]	N/A	Goal to improve governance and quality measures from current 10% to 100% of facilities[80]
Priority review for therapies - available for dementia	N/A[81]	Brazil's equivalent of the FDA, ANVISA, established a fast-track program in 2012. Drugs approved in the EU, US, Canada, Japan, and Australia would be accelerated in Brazil[82]	cFDA has established fast track regulatory approval for geriatric drugs/for drugs already approved by the FDA or EMA[83]	The country announced a fast track program for certain drugs that have received regulatory approvals in other markets, but Alzheimer's/dementia is not one of the disease areas[84]	The Saudi FDA has established guidelines for a fast track review of drugs, but no disease-specific info is available[85]

BUSINESS ENVIRONMENT

Data Point	Argentina	Brazil	China	India	Saudi Arabia
Patent protection - length, and strength	Patent protection for 20 years[86]	Patent protection for 20 years, but extensive patent backlog in Brazil[87]	Patent protection for 20 years[88]	Patent protection for 20 years, but patents are not regarded as strong[89 90]	Patent protection for 20 years[91]
Ease of doing business for private sector	Ranked 92 out of 137 in WEF's global competitiveness report[92]	Ranked 80 out of 137 in WEF's global competitiveness report[93]	Ranked 27 out of 137 in WEF's global competitiveness report[94]	Ranked 40 out of 137 in WEF's global competitiveness report[95]	Ranked 30 out of 137 in WEF's global competitiveness report[96]
IP protection	Ranked 89 out of 137 in WEF's Intellectual Property Protection Ratings[97]	Ranked 63 out of 137 in WEF's Intellectual Property Protection Ratings[98]	Ranked 49 out of 137 in WEF's Intellectual Property Protection Ratings[99]	Ranked 52 out of 137 in WEF's Intellectual Property Protection Ratings[100]	Ranked 34 out of 137 in WEF's Intellectual Property Protection Ratings[101]

EDUCATION & WORKFORCE

Data Point	Argentina	Brazil	China	India	Saudi Arabia
Specialist saturation	600 gerontological specialists since 1977[102] [103]	1,149 specialists in geriatrics[104]	N/A[105]	N/A[106]	N/A
Nurse saturation	1.55 nurses per 1,000 people[107]	7.4 nurses per 1,000 people[108]	2.4 nurses per 1,000 people[109]	1.37 per 1,000 people[110]	.72 nurses per 1,000 people[111]

PREVENTION & RISK REDUCTION

Data Point	Argentina	Brazil	China	India	Saudi Arabia
Participation of dementia organizations in global NCD alliance	Yes[112]	Yes[113]	Yes[114]	Yes[115]	Yes[116]

Appendix C: Endnotes

1. Ramesh Verma and Pardeep Khanna. "National Program of Health-Care for the Elderly in India: A Hope for Healthy Ageing." Int J Prev Med. 2013. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3843295/

2. "The World Factbook: Argentina." Central Intelligence Agency. 2018. Available at: https://www.cia.gov/library/publications/the-world-factbook/geos/ar.html

3. Population ages 65 and above (% of total). The World Bank. 2017. Available at: https://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS?locations=SA

4. "Elderly Population." Organization for Economic Co-Operation and Development. 2018. Available at: https://data.oecd.org/pop/elderly-population.htm

5. "Kerala State Initiative on Dementia." Alzheimer's Disease International. Available at: https://www.alz.co.uk/sites/default/files/pdfs/policy-india.pdf

6. Sudhir Kumar, Babu Varghese, Harish Tharayil, Jacob Roy. "Dementia Friendly Kerala: The Way Forward." Psychiatry in Kerala. 2015. Available at: https://kjponline.com/index.php/kjp/article/view/8

7. "Kerala State Initiative on Dementia." Alzheimer's Disease International. Available at: https://www.alz.co.uk/sites/default/files/pdfs/policy-india.pdf

8. Antonio Eduardo Nakamura, Davi Opaleye, Giovanni Tani, Cleusa Ferri. "Dementia Underdiagnosis in Brazil." The Lancet. 2015. Available at: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(15)60153-2/fulltext

9. "National Transformation Program 2020." Vision 2030; Kingdom of Saudi Arabia. Available at: http://vision2030.gov.sa/sites/default/files/NTP_En.pdf

10. Antonio Eduardo Nakamura, Davi Opaleye, Giovanni Tani, Cleusa Ferri. "Dementia Underdiagnosis in Brazil." The Lancet. 2015. Available at: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(15)60153-2/fulltext

11. "World Alzheimer Report 2011: The benefits of early diagnosis and intervention." Alzheimer's Disease International. 2011. Available at: https://www.alz.co.uk/research/world-report-2011.

12. Zheng Chen, Xuan Yang, Yuetao Song, et al. "Challenges of Dementia Care in China." Geriatrics. 2017. Available at: http://www.mdpi.com/2308-3417/2/1/7/pdf

13. "Casefinder Studies." Alzheimer's Disease International. Available at: https://www.alz.co.uk/1066/casefinder_studies.php

14. "Dementia Toolkit for Community Workers in Low-and Middle-Income Countries: Guide for Community-Based Management and Care of People with Dementia." World Health Organization Regional Office for the Western Pacific. 2018. Available at: http://iris.wpro.who.int/bitstream/handle/10665.1/14014/9789290618447-eng.pdf

15. Rural population (% of total). The World Bank. 2016. Available at: https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS

16. Urban population (% of total). The World Bank. 2016. Available at: https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS

17. Christina Wu, Lin Gao, Shulin Chen, et al. "Care services for elderly people with dementia in rural China: a case study." Bulletin of the World Health Organization. 2016. Available at: https://www.who.int/bulletin/volumes/94/3/15-160929/en/

18. Zheng Chen, Xuan Yang, Yuetao Song, et al. "Challenges of Dementia Care in China." Geriatrics. 2017. Available at: http://www.mdpi.com/2308-3417/2/1/7/pdf

19. Population ages 65 and above (% of total). The World Bank. 2017. Available at: https://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS?locations=SA

20. "Major Regulatory Policy Changes in China Will Impact Western Drug Development and Manufacturing Strategies." Paizabio. 2015. Available at: http://paizabio.com/news/press-releases/major-regulatory-policy-changes-in-china-will-impact-western-drug-development-and-manufacturing-strategies/

21. Ibid.

22. Kyra Rosow, Andrew Holzapfel, Jason Karlawish, Matthew Baumgart, Lisa J. Bain, Ara S Khachaturian. "Countrywide strategic plans on Alzheimer's disease: Developing the framework for the international battle against Alzheimer's disease." Alzheimer's & Dementia. 2011. Available at: http://alzheimerstoday.elsevier.com/Content/PDF/Countrywide_strategic_plans_on_Alzheimers_disease.pdf

23. Income tax department of the Government of India. Available at: http://www.incometaxindia.gov.in/

24. K Srinath Reddy. "India's Aspirations for Universal Health Coverage." New England Journal of Medicine. 2015. Available at: https://www.nejm.org/doi/full/10.1056/NEJMp1414214?query=recirc_inIssue_bottom_article

25. The Global Competitiveness Report: 2017-2018. World Economic Forum. Available at: http://reports.weforum.org/global-competitiveness-index-2017-2018/

26. Wang Hongyi. "Country's mental health services lacking." China Daily. 2012. Available at: http://www.chinadaily.com.cn/cndy/2012-05/16/content_15302489.htm

27. JY Liu, C Lai, D Dai, S Ting, K Choi. "Attitudes in the management of patients with dementia: Comparison in doctors with and without special training." East Asian Arch. Psychiatry. Available at: https://www.ncbi.nlm.nih.gov/pubmed/23535628

28. "National Transformation Program 2020." Vision 2030; Kingdom of Saudi Arabia. Available at: http://vision2030.gov.sa/sites/default/files/NTP_En.pdf

29. Physicians (per 1,000 people). The World Bank. 2016. Available at: https://data.worldbank.org/indicator/SH.MED.PHYS.ZS?locations=BR-AR-CN-IN-SA

30. Gill Livingston, Andrew Sommerlad, Vasiliki Orgeta, Sergi G Costafreda, Jonathan Huntley, et al. "Dementia prevention, intervention, and care." Lancet. 2017. Available at: https://www.thelancet.com/commissions/dementia2017

31. M Alkhunizan, A Alkhenizan, L Basudan. "Prevalence of Mild Cognitive Impairment and Dementia in Saudi Arabia: A Community-Based Study." Dement Geriatr Cogn Disord Extra. 2018. Available at: https://www.karger.com/Article/FullText/487231

32. "India - Dementia Friendly Communities." Alzheimer's Disease International. Available at: https://www.alz.co.uk/dementia-friendly-communities/india.

33. Ibid.

34. "Plan Estratégico Nacional PAMI Para un Cerebro Saludable, Enfermedad de Alzheimer Y Otras Demencias: 2016 – 2019." PAMI, INSSJP. Available at: http://www.pami.org.ar/pdf/Plan-Nacional.pdf

35. Knut Engedal and Jerson Laks. "Towards a Brazilian dementia plan? Lessons to be learned from Europe." Dementia e Neuropsychologia. 2016. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5642397/

36. Wei Xiong and Michael R. Phillips. "Translated and annotated version of the 2015-2020 National Mental Health Work Plan of the People's Republic of China." Shanghai Arch Psychiatry. 2016. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4984605/

37. Kyra Rosow, Andrew Holzapfel, Jason H. Karlawish, Matthew Baumgart, Lisa J. Bain, Ara S. Khachaturian. "Countrywide strategic plans on Alzheimer's disease: Developing the framework for the international battle against Alzheimer's disease." Alzheimer's & Dementia. 2011. Available at: http://alzheimerstoday.elsevier.com/Content/PDF/Countrywide_strategic_plans_on_Alzheimers_disease.pdf

38. Dementia India Report 2010. Alzheimer's Disease International's Global Alzheimer's Disease Chapter. 2010. Available at: http://ardsi.org/downloads/main%20report.pdf

39. Argentina – Dementia Friendly Communities. Alzheimer's Disease International. Available at: https://www.alz.co.uk/content/argentina-dementia-friendly-communities

40. Brazil - Dementia Friendly Communities. Alzheimer's Disease International. Available at: https://www.alz.co.uk/content/brazil-dementia-friendly-communities

41. Kyra Rosow, Andrew Holzapfel, Jason H. Karlawish, Matthew Baumgart, Lisa J. Bain, Ara S. Khachaturian. "Countrywide strategic plans on Alzheimer's disease: Developing the framework for the international battle against Alzheimer's disease." Alzheimer's & Dementia. 2011. Available at: http://alzheimerstoday.elsevier.com/Content/PDF/Countrywide_strategic_plans_on_Alzheimers_disease.pdf & Dementia in the Asia Pacific Region. Alzheimer's Disease International. 2014. Available at: https://www.alz.co.uk/adi/pdf/Dementia-Asia-Pacific-2014.pdf

42. India - Dementia Friendly Communities. Alzheimer's Disease International. Available at: https://www.alz.co.uk/dementia-friendly-communities/india.

43. Gross domestic spending on R&D. OECD Data. 2018. Available at: https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm#indicator-chart

44. Gross domestic spending on R&D. OECD Data. 2018. Available at: https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm#indicator-chart

45. Gross domestic spending on R&D. OECD Data. 2018. Available at: https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm#indicator-chart

46. "Asia Shows Strong R&D Growth." R&D Magazine. 2017. Available at: http://digital.rdmag.com/researchanddevelopment/2017_global_r_d_funding_forecast?pg=25#pg25

47. Innovation and Patents. IBEF. 2017. Available at: https://www.ibef.org/download/Innovation-and-Patents-June-2017.pdf

Research_and_development/

48. Saudi Arabia – Research and development expenditure as a share of GDP. Knoema. 2018. Available at: https://knoema.com/atlas/Saudi-Arabia/RandD-expenditure

49. Antonio Eduardo Nakamura, Davi Opaleye, Giovanni Tani, Cleusa P Ferri, Cleusa P Ferri. "Dementia underdiagnosis in Brazil." The Lancet. 2015. Available at: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(15)60153-2/fulltext

50. Amit Dias, Vikram Patel. "Closing the treatment gap for dementia in India." Indian Journal of Psychiatry. 2009. Available at: http://www.indianjpsychiatry.org/article.asp?issn=0019-5545;year=2009;volume=51;issue=5;spage=93;epage=97;aulast=Dias

51. Luís Felipe José Ravic de Miranda, Rafael de Oliveira Matoso, Márlon Vieira Rodrigues, Thiago Oliveira Lemos de Lima, Adriano Fiorini Nascimento, Fernando Castro Carvalho, Débora Regina de Melo Moreira, Jeferson Cruz Fernandes, Jonas Jardim de Paula, Luiz Alexandre V. Magno, Paulo Caramelli, Edgar Nunes de Moraes. "Factors influencing possible delay in the diagnosis of Alzheimer's disease." Dement Neuropsychol. 2011. Available at: http://www.scielo.br/pdf/dn/v5n4/1980-5764-dn-5-04-00328.pdf

52. Xin Yu, Shengdi Chen, Xiaochun Chen, Jianjun Jia, Chunhou Li, Cong Liu, Mondher Toumi, and Dominique Milea. "Clinical management and associated costs for moderate and severe Alzheimer's disease in urban China: a Delphi panel study." Translational Neurodegeneration. 2015. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4546035/

53. Dementia India Report 2010. Alzheimer's Disease International's Global Alzheimer's Disease Chapter. 2010. Available at: http://ardsi.org/downloads/main%20report.pdf

54. Al-Aama T. "Basic Geriatrics Knowledge Among Internal Medicine Trainees in a Teaching Hospital in Saudi Arabia." Journal of Cross-Cultural Gerontology. 2016. Available at: https://www.ncbi.nlm.nih.gov/pubmed/27033085

55. Carlos Henrique Ferreira Camargo, Giuliano Retzlaff, Filipe Fernandes Justus, and Marcelo Resende. "Patients with dementia syndrome in public and private services in southern Brazil." Dementia & Neuropsychologia. 2015. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5618993/

56. National Transformation Program 2020. Vision 2030 : Kingdom of Saudi Arabia. 2016. Available at: http://vision2030.gov.sa/sites/default/files/NTP_En.pdf

57. Ricardo F. Allegri, Pablo Bagnati, Sonia Brucki, Ricardo Nitrini. Global Clinical Trials for Alzheimer's Disease. 2013. Available in part at: https://books.google.com/

58. Carlos Henrique Ferreira Camargo, Giuliano Retzlaff, Filipe Fernandes Justus, and Marcelo Resende. "Patients with dementia syndrome in public and private services in southern Brazil." Dementia & Neuropsychologia. 2015. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5618993/

59. Mi Tian, Yan Zeng, Libo Sun and Qingmin Wu. "Alzheimers Disease and Dementia, Under-Recognized Public Health Crisis in China." Journal of Gerontology & Geriatric Research. 2014. Available at: https://www.omicsonline.org/open-access/alzheimers-disease-and-dementia-underrecognized-public-health-crisis-in-china-2167-7182.1000162.php?aid=31813

60. Zhaorui Liu, Emiliano Albanese, Shuran Li, Yueqin HuangEmail author, Cleusa P Ferri, Fang Yan, Renata Sousa, Weimin Dang and Martin Prince. "Chronic disease prevalence and care among the elderly in urban and rural Beijing, China - a 10/66 Dementia Research Group cross-sectional survey." BMC Public Health. 2009. Available at: https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-9-394

61. Krishnan Ganapathy. "Distribution of neurologists and neurosurgeons in India and its relevance to the adoption of telemedicine." Neurology India. 2015. Available at: http://www.neurologyindia.com/article.asp?issn=0028-3886;year=2015;volume=63;issue=2;spage=142;epage=154;aulast=Ganapathy

62. Hussein Algahtani, Bader Shirah, Faisal Boker, Albaraa Algamdi, and Abdulah Alkahtani. "Neurology Research in Saudi Arabia: Urgent call for action." Sultan Qaboos University Medical Journal. 2017. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5642363/

63. "Family Dynamics and Personal Strengths among Dementia Caregivers in Argentina." International Journal of Alzheimer's Disease. 2016. Available at: https://www.hindawi.com/journals/ijad/2016/2386728/

64. Elaine Thumé, Luiz Augusto Facchini, Grace Wyshak, and Paul Campbell. "The Utilization of Home Care by the Elderly in Brazil's Primary Health Care System." American Journal of Public Health. 2011. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3076415/

65. International Health Care Systems Profiles. The Commonwealth Fund. 2016. Available at: http://international.commonwealthfund.org/countries/china/

66. Amit Dias, Vikram Patel. "Closing the treatment gap for dementia in India." Indian Journal of Psychiatry. 2009. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3038542/

67. KS Shaji, K Smitha, KP Lal, MJ Prince. "Caregivers of people with Alzheimer's disease: a qualitative study from the Indian 10/66 Dementia Research Network." International Journal of Geriatric Psychiatry. 2003. Available at: https://www.ncbi.nlm.nih.gov/pubmed/12497550

68. "Dementia India Report 2010." Alzheimer's Disease International's Global Alzheimer's Disease Chapter. 2010. Available at: http://ardsi.org/downloads/main%20report.pdf

69. Saudi Arabia Health Care Market Overview. 2013. Available at: https://pdfs.semanticscholar.org/8b77/7bb337083d046ccf5b54f83f35d8611f5fa4.pdf

70. Xenia Scheil-Adlung. Extension of Social Security - Long-term care protection for older persons: A review of coverage deficits in 46 countries. International Labour Office, Geneva. 2015. Available at: http://ageingcommitteegeneva.org/wp-content/uploads/2017/11/ILO-2015_Long_term-care-protection-for-older-persons.pdf

71. Luiz E. Garcez-Leme and Mariana Deckers Leme."Costs of elderly health care in Brazil: challenges and strategies." Medical Express. 2014. Available at: http://www.medicalexpress.net.br/details/36/costs-of-elderly-health-care-in-brazil--challenges-and-strategies1

72. Weida Li. "China has 28,000 registered nursing homes." GB Times. 2018. Available at: https://gbtimes.com/china-has-28000-registered-nursing-homes.

73. Christina Nelson. "Senior Care in China: Challenges and Opportunities." China Business Review. 2012. Available at: https://www.chinabusinessreview.com/senior-care-in-china-challenges-and-opportunities/

74. Dementia India Report 2010. Alzheimer's Disease International's Global Alzheimer's Disease Chapter. 2010. Available at: http://ardsi.org/downloads/main%20report.pdf

75. Alia Almoajel, Alham Al-Salem, Lina Al-Ghunaim, Sara Al-Amri. "The Quality of Home Healthcare Service in Riyadh/Saudi Arabia." Asian Journal of Natural & Applied Sciences. 2016. Available at: https://www.researchgate.net/profile/Alyah_Almoajel/publication/319644780_THE_QUALITY_OF_HOME_HEALTHCARE_SERVICE_IN_RIYADHSAUDI_ARABIA/links/59b7acd0458515c212b4b390/THE-QUALITY-OF-HOME-HEALTHCARE-SERVICE-IN-RIYADH-SAUDI-ARABIA.pdf

76. Regional Report from Saudi Arabia. IAHPC News. 2009. Available at: https://hospicecare.com/news/09/05/regional_report.html

77. The changing regulatory environment in Latin America. Centre for Innovation in Regulatory Science. 2015. Available at: http://www.cirsci.org/wp-content/uploads/2016/01/CIRS-RD-Briefing-58-FINAL-for-distribution.pdf

78. Rafael Santos Santana, Evandro de Oliveira Lupatini, Silvana Nair Leite. "The regulation and adoption of health technologies under Brazil's Unified Health System: barriers to access to medicines for diseases of poverty?" Ciência & Saúde Coletiva. 2017. Available at: http://www.scielo.br/scielo.php?pid=S1413-81232017002501417&script=sci_arttext&tlng=en

79. Zheng Chen, Xuan Yang, Yuetao Song, Binbin Song, Yi Zhang, Jiawen Liu, Qing Wang, and Jia Yu. "Challenges of Dementia Care in China." Geriatrics. 2017. Available at: https://pdfs.semanticscholar.org/f5a2/5ea0bf7df61afcf0377a5a4198bdcc0ee3fc.pdf

80. National Transformation Program 2020. Vision 2030 : Kingdom of Saudi Arabia. 2016. Available at: http://vision2030.gov.sa/sites/default/files/NTP_En.pdf

81. Argentina Pharmaceutical Country Profile. WHO. 2010. Available at: http://apps.who.int/medicinedocs/documents/s19736en/s19736en.pdf

82. "Brazil OKs fast-track assessment for device and pharma trial applications." JMC. 2012. Available at: http://www.jmcinc.net/brazil-oks-fast-track-assessment-for-device-and-pharma-trial-applications/

83. Major Regulatory Policy Changes in China Will Impact Western Drug Development and Manufacturing Strategies. PaizaBio. 2015. Available at: http://paizabio.com/news/press-releases/major-regulatory-policy-changes-in-china-will-impact-western-drug-development-and-manufacturing-strategies/

84. PT Jyothi Datta. "Fast-track approvals for TB, hepatitis, HIV drugs on the anvil." The Hindu Business Line. 2017. Available at: https://www.thehindubusinessline.com/economy/fasttrack-approvals-for-tb-hepatitis-hiv-drugs-on-the-anvil/article9557599.ece

85. SFDA Priority Review Guidance. SFDA. Available at: https://www.sfda.gov.sa/en/drug/drug_reg/Regulations/SFDA%20-%20Prority%20Review%20Guidance%20version%201.1.pdf

86. Argentina – Patent Law. IPDalton. 1996. Available at: http://ipdalton.com/imagenes/Law%20-%20Patents.pdf

87. Ministry of Development, Industry, and Foreign Trade [Brazil]. Patent Lens. 2007.

Available at: http://www.bios.net/daisy/patentlens/3554.html

88. FAQ – China. European Patent Office. 2016. Available at: http://www.epo.org/searching-for-patents/helpful-resources/asian/china/faq.html

89. Growth of Innovation and Patents Industry in India – Infographic. IBEF. 2017. Available at: https://www.ibef.org/industry/research-development-india/infographic

90. Surabhi Agarwal. "Protecting Patents: India worst in world." Business Standard. 2014. Available at: http://www.business-standard.com/article/economy-policy/protecting-patents-india-worst-in-world-114012900371_1.html

91. Saudi Patent Office AND GULF (GCC Patent office). Drug Patents International. 2015. Available at: http://drugpatentsint.blogspot.com/2015/01/saudi-patent-office-and-gulf-gcc-patent.html

92. Global Competitiveness Index: 2017-2018 edition. World Economic Forum. 2018. Available at: http://reports.weforum.org/global-competitiveness-index-2017-2018/countryeconomy-profiles/

93. Global Competitiveness Index: 2017-2018 edition. World Economic Forum. 2018. Available at: http://reports.weforum.org/global-competitiveness-index-2017-2018/countryeconomy-profiles/

94. Global Competitiveness Index: 2017-2018 edition. World Economic Forum. 2018. Available at: http://reports.weforum.org/global-competitiveness-index-2017-2018/countryeconomy-profiles/

95. Global Competitiveness Index: 2017-2018 edition. World Economic Forum. 2018. Available at: http://reports.weforum.org/global-competitiveness-index-2017-2018/countryeconomy-profiles/

96. Global Competitiveness Index: 2017-2018 edition. World Economic Forum. 2018. Available at: http://reports.weforum.org/global-competitiveness-index-2017-2018/countryeconomy-profiles/

97. Intellectual Property Protections, Competitiveness Rankings. World Economic Forum. 2018. Available at: http://reports.weforum.org/global-competitiveness-report-2015-2016/competitiveness-rankings/

98. Intellectual Property Protections, Competitiveness Rankings. World Economic Forum. 2018. Available at: http://reports.weforum.org/global-competitiveness-report-2015-2016/competitiveness-rankings/

99. Intellectual Property Protections, Competitiveness Rankings. World Economic Forum. 2018. Available at: http://reports.weforum.org/global-competitiveness-report-2015-2016/competitiveness-rankings/

100. Intellectual Property Protections, Competitiveness Rankings. World Economic Forum. 2018. Available at: http://reports.weforum.org/global-competitiveness-report-2015-2016/competitiveness-rankings/

101. Intellectual Property Protections, Competitiveness Rankings. World Economic Forum. 2018. Available at: http://reports.weforum.org/global-competitiveness-report-2015-2016/competitiveness-rankings/

102. JR Jauregui, RK Rubin,R Kaplan and CG Musso. "Geriatric Care and Gerontological research in Argentina." Reviews in Clinical Gerontology. 2011. Available at: https://www.researchgate.net/publication/258820593_Geriatric_care_and_gerontological_research_in_Argentina

103. Alberto Luis Fernandez, Aldo Ferreres, Alejandra Morlett-Paredes, Diego Rivera & Juan Carlos Arango-Lasprilla. "Past, present, and future of neuropsychology in Argentina." The Clinical Neuropsychologist. 2015. Available at: https://www.tandfonline.com/doi/abs/10.1080/13854046.2016.1197313?src=recsys&journalCode=ntcn20

104. Silvia Pereira. Recruitment to Geriatric Medicine: Successful Strategies from an International Perspective. 2011. Available at: https://www.eiseverywhere.com/file_uploads/19f01fdf1d98834255dc95f502b2bf5b_RecruitmenttoGeriatricMedicine-SilviaPereira.pdf

105. Mi Tian, Yan Zeng, Libo Sun and Qingmin Wu. "Alzheimers Disease and Dementia, Under-Recognized Public Health Crisis in China." Journal of Gerontology & Geriatric Research. 2014. Available at: https://www.omicsonline.org/open-access/alzheimers-disease-and-dementia-underrecognized-public-health-crisis-in-china-2167-7182.1000162.php?aid=31813

106. Dementia in the Asia Pacific Region. Alzheimer's Disease International. 2014. Available at: https://www.alz.co.uk/adi/pdf/Dementia-Asia-Pacific-2014.pdf

107. Tim Kruth. Advanced Practice Nursing in Argentina. International Advanced Practice Nursing. 2013. Available at: https://internationalapn.org/2013/10/30/advanced-practice-nursing-in-argentina/

108. Nurses and midwives (per 1,000 people). The World Bank. 2018. Available at: https://data.worldbank.org/indicator/SH.MED.NUMW.P3?locations=BR

109. Nurses. OECD Data. 2018. Available at: https://data.oecd.org/healthres/nurses.htm

110. OECD.Stat. OECD. 2018. Available at: http://stats.oecd.org/

111. National Transformation Program 2020. Vision 2030 : Kingdom of Saudi Arabia. 2016. Available at: http://vision2030.gov.sa/sites/default/files/NTP_En.pdf

112. NCD Alliance. 2018. Available at: https://ncdalliance.org/

113. NCD Alliance. 2018. Available at: https://ncdalliance.org/

114. NCD Alliance. 2018. Available at: https://ncdalliance.org/

115. NCD Alliance. 2018. Available at: https://ncdalliance.org/

116. NCD Alliance. 2018. Available at: https://ncdalliance.org/

ADI is the international federation of 90 Alzheimer associations around the world, in official relations with the World Health Organization. ADI's vision is prevention, care and inclusion today, and cure tomorrow. ADI believes that the key to winning the fight against dementia lies in a unique combination of global solutions and local knowledge. As such, it works locally, by empowering Alzheimer associations to promote and offer care and support for persons with dementia and their care partners, while working globally to focus attention on dementia and campaign for policy change from governments. For more information, please visit www.alz.co.uk.

The Global Coalition on Aging aims to reshape how global leaders approach and prepare for the 21st century's profound shift in population aging. GCOA uniquely brings together global corporations across industry sectors with common strategic interests in aging populations, a comprehensive and systemic understanding of aging, and an optimistic view of its impact. Through research, public policy analysis, advocacy, and strategic communications, GCOA is advancing innovative solutions and working to ensure global aging is a path to health, productivity and economic growth. For more information, visit www.globalcoalitiononaging.com.