# International Health Insights:
# Dementia Prevention

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# Authorship, acknowledgements and contact information

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## What are International Health Insights?

These reports draw on international policies and best practice, evidence, and guidance, providing actionable intelligence to inform and strengthen public health and the care system in Wales.

Originally launched during the COVID-19 pandemic in 2020 (known then as International Horizon Scanning), the report series supported Wales's dynamic public health response and recovery. Since 2022, the scope has expanded to cover a broad range of emerging and priority health topics, commissioned by key stakeholders, such as Welsh Government and NHS executive bodies.

This work is part of Public Health Wales' wider systematic approach to intelligence gathering and evidence translation into policy and practice. It supports coherent, inclusive, and evidence-informed action that advances the implementation of the Wellbeing of Future Generations (Wales) Act and the A Healthier Wales strategic plan, contributing to a healthier, more equal, resilient, prosperous, and globally responsible Wales.

### Disclaimer
The reports provide a high-level summary of international learning only. Following the World Health Organization (WHO) rapid review methodology, they summarise recent evidence, policies, practical approaches, real-life experiences, examples from selected countries, and guidance from key global organisations. They are not designed to be comprehensive or to provide in-depth analysis or quality assurance. Drawing on both scientific and grey literature, they include sources to enable further exploration.

# Contents

# Key messages

## Overview and scope

- This report explores international approaches to **dementia prevention**, summarising evidence on **strategies across the life course**.
- It recognises that **risk factors accumulate** from early life and are **shaped by societal conditions**.

## Why prevention matters

Dementia is a **major and escalating global public health challenge**:
- An estimated **57 million people** worldwide were living with dementia in 2019, a figure projected to reach **153 million by 2050**.
- Dementia is the **seventh leading cause of death** globally.
- **Prevention potential**: Research suggests that **up to 45% of cases could be prevented** by **addressing 14 modifiable risk factors** across life stages.

## Key findings

**Effective prevention** requires integrated **action at three levels**: single, multi-domain, and structural:

1. **Single-component behavioural change interventions remain central** to global strategies:
- They target **individual modifiable health and lifestyle risks**, such as physical inactivity, smoking, social isolation, alcohol misuse, untreated hearing and vision loss, and cardio-metabolic conditions.
- They have relatively **modest standalone impact** but are **essential for reducing cumulative risk**.
- Efforts to lower dementia risk should **begin early and be sustained throughout life**.

2. **Multi-component interventions** represent the **most promising strategy**:
- They target a **multitude of risk factors** that usually are clustered within individuals.
- They can result in **significant improvements**. For example, the two-year Finnish Geriatric Intervention Study addressing diet, physical exercise, cognitive training, and vascular risk monitoring in at-risk elderly people showed cognitive function was 25% higher in the intervention group (see **FINGER** trial on page 11).
- Multi-domain models are being **adapted and optimised for diverse settings** across the world, involving a network of more than **40 countries** (see the **WW-FINGERS network** on page 11).

3. **Structural population-level policy measures are critical** to complement lifestyle changes. They can include:
- **Fiscal policies**, such as healthy food subsidies, alcohol/tobacco taxes,
- **Legislation**, such as smoking bans, helmet laws, low-emission zones,
- **Market restrictions** on health harming products, and
- **Environmental adaptations**, such as green spaces and active travel infrastructure.
- All of these **must foster equity**, ensuring high-risk and disadvantaged groups are included.

# Implications for policy and practice

Despite **increasing policy attention globally**, implementation faces **major challenges**:
- Only a quarter (26%) of WHO Member States have an **National Dementia Plan**.
- Existing plans often **lack funding and monitoring**.
- **Stigma, low awareness, resource gaps, and inequities** persist.
- **Readiness for innovations**, such as using AI and biomarkers, **remains limited**.

**Priority actions:**
1. **Make brain health a national priority** within health strategies.
2. **Invest across the life course** to address risk factors from childhood to old age.
3. **Scale up multi-domain interventions**, adapting proven models, such as FINGER, to national and local contexts.
4. **Reduce inequities** by targeting high-risk groups and ensuring equitable access to education, screening, and care.
5. **Leverage innovation** for AI-driven early detection, blood biomarkers, and new therapies.
6. **Build workforce capacity** to deliver prevention and brain health promotion.
7. **Engage communities** through awareness campaigns and **co-designed interventions** to reduce stigma.
8. **Monitor progress** using robust data systems to track outcomes and equity impacts.

# Country insights

Examples highlight diverse approaches, from policy frameworks to community-based interventions:
- **Finland**: Dementia prevention is embedded in national ageing and health strategies, supported by legislation and municipal delivery. Key actions include the FINGER multidomain lifestyle trial, nationwide brain health campaigns, digital tools, and structural measures, such as free education, physical activity promotion, and strict alcohol regulation.
- **Japan**: Prevention is underpinned by a robust policy framework, including the Basic Act on Dementia (2024) and a national dementia plan. Large-scale community initiatives like the Dementia Supporters Programme which has trained millions of advocates, are complemented by technology-driven safety and screening solutions.
- **The Republic of Korea**: The National Dementia Plan (2021–2025) delivers prevention through 256 publicly funded Local Dementia Centres offering screening, education, and caregiver support. The National Dementia Early Detection Programme provides free biennial screening for adults 60+, while the SUPERBRAIN multidomain intervention promotes cognitive health nationwide.
- **Uruguay**: A regional leader, Uruguay launched its National Dementia Plan (2023) emphasising risk reduction, brain health education, anti-stigma initiatives, and caregiver support. Innovations include school-based brain health education, advanced digital health infrastructure, and participation in LatAm-FINGERS, a multidomain lifestyle intervention trial.
- **United Kingdom**: Policy responses vary. Wales and Scotland have comprehensive strategies emphasising prevention and rights-based care, while England lacks a national plan but signals reform through its 10-Year Health Plan. Key initiatives include public awareness campaigns (Dementia Friends, Think Brain Health), integration of prevention into NHS Health Checks, and major research investments such as APPLE TREE, Our Future Health, and biomarker validation projects to advance early detection and scalable interventions.

# Table of abbreviations

| Acronym | Definition |
|---------|------------|
| AI | Artificial Intelligence |
| APPLE-Tree | Active Prevention in People at risk of dementia through Lifestyle, bEhaviour change and Technology to build REsiliEnce |
| APOE ε4 | Apolipoprotein E |
| DALYs | Disability-Adjusted Life Years |
| CVD | Cardiovascular Disease |
| FINGER | Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability |
| J-MINT | Japan-Multimodal Intervention Trial for the Prevention of Dementia |
| MCI | Mild Cognitive Impairment |
| NDPs | National Dementia Plans |
| NGOs | Non-Governmental Organisations |
| RCT | Randomised Control Trial |
| READ-OUT | REAl-world Dementia OUTcomes |
| SUPERBRAIN | SoUth Korean study to PrEvent cognitive impaiRment and protect BRAIN health |
| PAHO | Pan American Health Organization |
| WHO | World Health Organization |

# Introduction

## 1. Scope and focus

- This report summarises global evidence on **dementia prevention strategies and approaches**.
- It adopts a **life course approach,** recognising that risk factors accumulate across the lifespan and are shaped by **broader determinants of health**.[1]
- The report synthesises evidence across **four key areas of intervention** and implementation:
  - **Single component interventions** targeting specific risk factors.
  - **Multi-domain component interventions** addressing clustered risks.
  - **Population-level policy measures** for structural change.
  - **Future innovations** (including digital health and artificial intelligence (AI) tools)
- **Five country case studies** illustrate practical implementation in Finland, Japan, the Republic of Korea, Uruguay, and the United Kingdom.

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### Definitions used in this report

**Brain health**: Defined by the World Health Organization (WHO) as "*the state of brain functioning across cognitive, sensory, social-emotional, behavioural and motor domains, allowing a person to realize their full potential over the life course, irrespective of the presence or absence of disorders*".[2] This perspective frames brain health as dynamic and evolving, shaped by factors such as physical health, safe environments, lifelong learning, social connection, and access to quality services. Addressing these determinants can improve wellbeing and generate wider social and economic benefits.[2]

**Neurological disorders**: Conditions affecting the central and peripheral nervous systems. They include epilepsy, migraine, neurodegenerative disorders (including dementia and Parkinson disease), cerebrovascular diseases (including stroke), infections, immune-related and neuromuscular disorders, neurodevelopmental conditions, traumatic injuries, nervous system cancers, and related diseases.[3]

**Dementia**: A syndrome caused by several diseases that progressively damage brain cells, leading to cognitive decline beyond what might be expected from the usual consequences of biological ageing. **Alzheimer disease** accounts for 60-70% of cases, followed by **vascular dementia** as the next most common form.[4]

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## 2. Methods

- **Evidence search**: Systematic searches were conducted using **Cochrane** and **Campbell Collaboration** databases. To supplement these, additional searches on **Google** and **Google Scholar** identified grey literature and provided detailed information for case studies (search results and evidence table available on request).
- **Case study development and selection:** Five country case studies were developed to illustrate dementia prevention approaches that could be relevant and effective in Wales. Selection was based on the availability of evidence from systematic reviews and grey literature, and similarity to the Welsh context (e.g., health service funding models, demographic profiles). Additional targeted searches gathered in-depth information for each case study.

# 3. Why is this issue important?

## The global challenge of dementia
- **Scale of the problem**: Dementia is a major global health challenge, affecting **57 million people** in 2019, with numbers projected to nearly triple to 153 million by 2050.[5]
- **Mortality and disability**: It is the **seventh leading cause of death** worldwide, responsible for **1.6 million deaths** in 2019. It is also a significant driver of disability and dependency among older adults; it ranks **25th for disability-adjusted life years** (DALYs), which more than doubled between 2000 and 2019.[6]
- **Gender disparities**: Women bear a disproportionate burden, accounting for **65% of dementia-related deaths** in 2019 and experiencing 66% higher DALYs than men aged 60+.[6]
- **Economic impact**: Global dementia costs reached **$1.3 trillion in 2019**, projected to rise to $2.8 trillion by 2030.[7] This figure covers costs for informal care (family), social care (community and residential), and medical care (primary and secondary treatment).[8]

## Limitations of current dementia treatments
- **Limited treatment effectiveness:** Current treatments for age-related brain diseases, including dementia, offer only modest benefits. Symptomatic drugs, such as **cholinesterase inhibitors**, may slow cognitive decline in early stages but do not halt disease progression, and none are curative.[9] [10]
- **Diagnostic advances:** Techniques such as biomarkers are improving early detection, but major therapeutic breakthroughs that significantly change long-term outcomes are still lacking.[9]
- **Prevention imperative:** This reality underscores the importance of preventing disease onset whenever and as early as possible. [6 9 10]

## Brain health as a lifelong priority
- **Cornerstone of well-being:** Brain health is increasingly recognized as essential for disease prevention and mental well-being across the lifespan.[11]
- **Modifiable risks:** The belief that dementia is inevitable with ageing is being challenged by growing evidence. The **2024 Lancet Commission**[9] reports that up to 45% of dementia cases may be prevented by addressing 14 modifiable risk factors throughout life (see Figure 1).
- **Life course approach:** Risk factors accumulate across life stages:
  - **Early life**: low educational attainment
  - **Midlife**: hearing loss, obesity, traumatic brain injury
  - **Later life**: social isolation, air pollution, vision loss

  It is never too early or too late to act, **lifestyle changes can reduce risk at any stage of life**.[9]
- **Clustering of risks:** Modifiable risks often cluster and interact (e.g. obesity increases hypertension risk), necessitating multi-domain interventions.[9]
- **Shared risk, collective benefit:** Many risk factors are common to multiple conditions, including dementia, stroke, and late-life depression. Targeting these shared risks yields broad health and resilience benefits.[10]
- **Economic rationale:** International evidence shows that prevention strategies are cost-saving, improve quality of life, and deliver wider social benefits.[9 12]

Figure 1: Fourteen modifiable dementia risks factors throughout life[13]
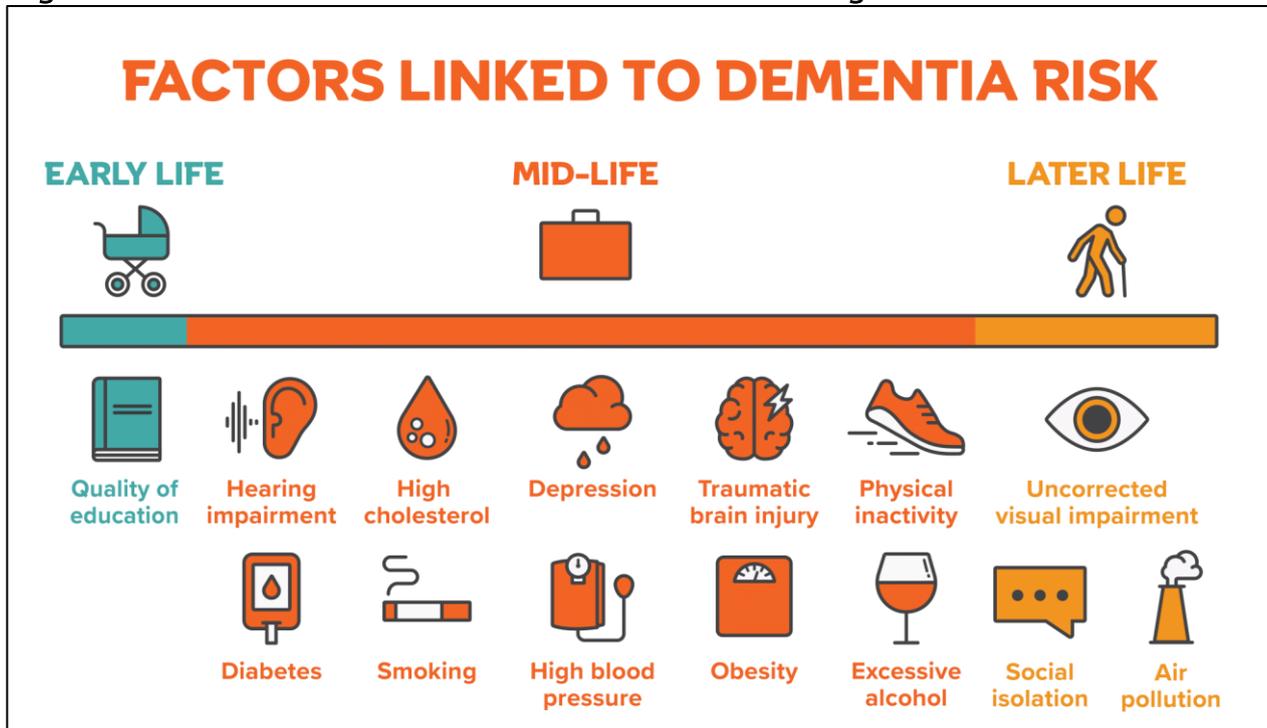


# Dementia prevention – what works?

## 1. Single-component interventions

- **Foundational role:** Single-component interventions focused on individual health behaviours and specific modifiable risk factors form a cornerstone of global dementia prevention strategies. These approaches are supported by strong scientific consensus indicating that up to 45% of dementia cases could be prevented by addressing these factors across the life course (See Table 1).[9 12]
- **Life course perspective:** Interventions target 14 modifiable risk factors spanning early life to older age, recognising that risks accumulate over time and require sustained, stage-specific action.[9]
- **Effectiveness:** Evidence shows these interventions deliver modest cognitive benefits and often lack strong evidence of long-term dementia prevention when implemented in isolation.[9 12]
- **Broader health impact:** Despite limitations, these strategies remain critical because many modifiable risks, such as hypertension, obesity, and physical inactivity, are shared across multiple conditions. For example, there is an established relationship[14] between cardiovascular disease (CVD) and dementia, particularly vascular dementia. Whilst the underlying mechanisms[15] are complex and multifactorial, the association is likely to be due to the shared risk factors: raised blood pressure, cholesterol, diabetes, obesity, physical inactivity and smoking. This overlap provides a strong scientific basis for prevention efforts that can enhance overall brain health and resilience across populations.[12 16]

## Table 1: Evidence on specific modifiable risk factors for dementia

| Risk factor | Evidence summary | Recommended actions (Lancet)[9] |
|---|---|---|
| Education and cognitive training | Higher education and lifelong cognitive stimulation reduce dementia risk. [9 17 18] Computerized training shows small, immediate benefits; long-term impact unclear.[19 20 21] | Ensure access to quality education; promote cognitively stimulating activities in midlife. |
| Physical activity | Regular exercise is linked to lower dementia risk.[9 22] Evidence varies by intensity and duration.[23] Some randomised controlled trials (RCTs) show modest cognitive benefits.[9] | Encourage sustained physical activity across adulthood. |
| Hearing loss | Treating hearing loss significantly decreases dementia risk.[24 25] Research consistently supports the role of hearing aids in lowering dementia risk. [9] | Improve access to hearing aids; reduce harmful noise exposure. |
| Depression treatment | Consistent association between depression and dementia. [9 26] New evidence suggests effectively treating depression appears to reduce dementia risk.[27] | Ensure effective depression treatment. |
| Smoking cessation | Smoking, particularly in midlife, is a significant risk factor for dementia, with evidence strongly suggesting that smoking cessation reduces dementia risk. [9 28] | Implement education, pricing policies, and smoking bans; provide cessation support. |
| Alcohol | Heavy midlife drinking is associated with an increased risk of dementia. Evidence supports limiting alcohol consumption as part of dementia prevention strategies. [9 29 30] | Reduce excessive consumption through pricing and awareness campaigns. |
| Traumatic brain injury | Traumatic brain injury, especially when sustained in midlife or earlier, is a significant risk factor for dementia.[31 32] Common causes include falls and sports injuries. | Promote helmet use in sports and cycling. |
| Hypertension | Midlife hypertension is a major risk factor.[9] Antihypertensive medication is protective,[33] although some studies are too short to show a difference in dementia incidence.[34] | Maintain systolic BP ≤130 mmHg from age 40. |
| Obesity | Midlife obesity is a recognized risk factor for dementia and intentional modest weight loss has been associated with improvements in cognition.[9 35 36] | Promote healthy weight and early obesity treatment. |
| Diabetes | Type 2 diabetes is a significant risk factor for dementia. Improved control of diabetes and specific anti-diabetic medications have been associated with dementia risk reduction.[9 37] | Maintain a healthy weight and treat obesity as early as possible |
| LDL cholesterol | Recent large-scale studies and meta-analyses show that elevated LDL levels are associated with a higher incidence of all-cause dementia.[9 38] | Detect and treat high LDL cholesterol from midlife |
| Social isolation | Strong link to dementia.[9 39] Interventions to boost social contact show mixed results but may help protect brain health and build cognitive reserve. [9 40 41] | Create age-friendly environments; encourage social participation. |
| Vision loss | Meta-analyses show untreated vision loss increases dementia risk.[42 43] Treating visual impairments is effective and cost-efficient. [9] | Ensure accessible screening and treatment. |
| Air pollution | Exposure to air pollution is increasingly linked to higher dementia risk.[44] Emerging evidence suggests that improving air quality can reduce dementia risk. [9] | Reduce air pollution exposure through policy and urban planning. |

# 2. Multi-domain component interventions

Given the multifactorial nature of dementia, interventions targeting **multiple risk factors simultaneously** are considered the most effective prevention strategy.[6] [9]

## The FINGER trial: A benchmark for success
- The **FINGER trial** provides the most robust and widely replicated evidence supporting multi-domain intervention strategies[45] [46] (see Finland case study, page 16).
- This RCT demonstrated that a 2-year programme combining dietary guidance, exercise, cognitive training, and vascular risk management in older adults at elevated risk of dementia showed cognitive function was 25% higher in the intervention group. Benefits were observed across all cognitive domains and socioeconomic groups. It also reduced the incidence of new chronic diseases.[45] [46]

## Challenges in scaling
- The programme was resource-intensive, requiring more than 200 hours of expert time per participant, making large-scale implementation difficult. Other trials showed mixed results, though benefits often appear in high-risk subgroups.[47] [48]

## Global expansion: The WW-FINGERS network
- To enhance scalability and adaptability, the FINGER model has evolved into the **WW-FINGERS** network, active in more than 60 countries, harmonising protocols and sharing data to adapt interventions globally.[6] [46]
- **Status**: 13 trials completed, 15 ongoing, more planned.[49]
- **Adaptations:**
  - **UK APPLE-Tree** (Active Prevention in People at risk of dementia through Lifestyle, bEhaviour change and Technology to build REsiliEnce) programme: Testing a scalable lifestyle intervention targeting five key risks (diabetes, inactivity, isolation, depression, smoking) in people with Mild Cognitive Impairment (MCI).[50]
  - Similar trials are underway in Japan, Uruguay, and the Republic of Korea (see case studies, pages 17-21).

## Genetic risk
- Multidomain interventions demonstrate efficacy even in individuals with **Apolipoprotein E (APOE ε4) genetic risk**, reinforcing their relevance across risk profiles.[9]

# 3. Public health and population-level policy interventions

## Global and national frameworks
- The international response to dementia is anchored in WHO-led frameworks, reflecting a growing global commitment to brain health.
- The **Global Action Plan on the Public Health Response to Dementia (2017–2025, extended to 2031)**[51] sets out seven action areas, including risk reduction, public awareness, early diagnosis, treatment, and long-term care. It aligns closely with the **Intersectoral Global Action Plan on Epilepsy and Other Neurological Disorders (2022–2031)**,[52] which provides a 10-year roadmap for reducing the global burden of neurological conditions.[6]

- **National Dementia Plans (NDPs)** translate these global commitments into action, but progress is uneven: only **26% of WHO Member States** have a verified dementia policy, and many lack funding, coordination, and monitoring.[6] Effective policy requires sustained financing, clear care pathways, and robust evaluation.[12]

## A public health approach

- A public health lens is now widely recognised as critical for effective dementia prevention.
- Many risk factors stem from lifelong socioeconomic disadvantage, making it vital to address **wider determinants of health** such as access to education, healthcare, and healthy environments to reduce risk across populations.[6]
- This approach requires an **interdisciplinary, cross-sector strategy** across the life course, as outlined in the Global Dementia Action Plan.[51] As risk factors are cumulative, **multi-factorial interventions** yield better outcomes than isolated efforts. [6]

## Structural action for primary prevention

- Preventing dementia requires coordinated action at both individual and population levels. While lifestyle changes are important, structural interventions and policy reforms are essential to address modifiable risk factors at scale. Examples include:
  - **Fiscal policies**: Subsidies for healthy food, and taxes on alcohol and tobacco
  - **Marketing regulations**: Restrictions on advertising unhealthy products
  - **Legislative measures**: Smoking bans, helmet laws, low-emission zones
  - **Environmental adaptations**: Green spaces, active travel infrastructure, adequate housing.[9][53]

## Addressing equity through policy

1. **Tackling structural inequalities**
   Dementia risk is closely linked to social and economic inequalities. Unequal access to education, healthcare, and safe environments must be addressed, alongside systemic conditions that perpetuate disadvantage in early and midlife.[9]

2. **Prioritising vulnerable populations**
   Policies must be inclusive and tailored to high-risk groups:
- **Minority ethnic communities and socioeconomically disadvantaged populations** often face a higher burden of risk factors.[9]
- **Migrant communities**: Many national plans lack culturally tailored recommendations.[54]
- **LGBTQI+ individuals**: Lifelong discrimination increases mental health risks, isolation, and barriers to care.[55]
- **People with Down syndrome**: Elevated Alzheimer's risk requires tailored interventions such as physical activity and cognitive training.[55]

3. **Addressing wider determinants of health**
- Prevention must go beyond health promotion to include **systemic improvements in living conditions,** including access to nutritious food, safe and inclusive housing, reduced noise and pollution exposure, and infrastructure that supports physical activity and social connection.[9]

4. **Improving data and research equity**
- Research representation is skewed toward high-income countries and participants of European origin, limiting generalizability. Biomarker bias in Alzheimer's research raises concerns about diagnostic accuracy across ethnic groups.[9]

## Awareness campaigns and advocacy

- **Why they matter:** Awareness and advocacy are vital for reducing stigma, correcting misconceptions, and addressing persistently low public understanding of dementia and brain health. These efforts also mobilize political will, secure resources, and drive population-level behaviour change.[10][12]
- **Global targets:** The WHO Global Action Plan calls for **100% of countries to have at least one functioning awareness campaign or advocacy programme by 2031**.[51] Yet, as of 2022, only 24% of WHO Member States reported having such a campaign.[12]
- **Current challenges:** Brain health remains under-prioritized, limiting visibility and funding. Stigma and fear, particularly around dementia, further hinder engagement and uptake of preventive measures.[10]
- **Key elements of effective campaigns:**
  - **Civil society leadership**: Grassroots organizations often drive design and delivery.
  - **Strategic partnerships**: Collaborations with WHO, regional bodies (e.g., Pan American Health Organization (PAHO)), and Non-Governmental Organisations (NGOs) (e.g., Alzheimer's Disease International) enhance cultural relevance and policy traction.
  - **Multi-channel communication**: Social media, television, radio, and print media ensure broad reach, with social media often cited as particularly effective.
  - **Inclusive messaging**: Campaigns must be accessible to all, including people with disabilities, using diverse formats such as audio, video, and easy-read materials (see Box 1). [6][10]
- **Measuring impact**: Evaluation remains complex, with limited evidence on long-term stigma reduction. Robust monitoring frameworks are needed to track behavioural and attitudinal change over time.[6]

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### Box 1. "Let's Talk About Dementia" campaign

**Overview:**
- Launched by **PAHO** in partnership with **Alzheimer's Disease International**, this campaign is a leading example of regional awareness-raising on dementia.

**Launch details:**
- **Launch**: September 2019, aligned with World Alzheimer's Month.
- **Objective**: Demystify dementia, encourage open dialogue, and promote better planning and support for people living with dementia and their carers.

**Key features:**
- **Multilingual materials**: Posters and social media cards available in multiple languages.
- **Content focus**: Importance of talking about dementia, warning signs, practical risk-reduction tips.
- **Channels**: Social media (Facebook, Twitter, Instagram), posters, press releases.

**Impact:**
- **Engagement**: ~800,000 people engaged via social media; ~30,000 campaign webpage visits.
- **Outcomes**: Increased regional awareness, requests for country-level adaptation, and strengthened collaboration between civil society, ministries of health, and PAHO country offices.

**Why it matters:**
- This campaign shows how culturally tailored, multisectoral approaches can reduce stigma and foster collaboration. Its success offers a replicable model for other regions aiming to raise awareness and promote dementia prevention.[6]

# 4. Future innovations – digital health and artificial intelligence (AI) tools

Technological advances are reshaping dementia prevention, particularly in early detection, secondary prevention, and personalized care. Digital health, AI, and biomarker science are transforming how risk is identified, monitored, and managed across the life course.

## Digital health technologies
- **Mobile and wearable devices**: Smartphones, wearables, and augmented reality tools can:
  - Detect early neurodegenerative changes
  - Monitor physical and cognitive health
  - Support daily living and social engagement

  These offer scalable, non-invasive monitoring but evidence on their effectiveness, particularly for screening and long-term management, is still emerging.[9]
- **Equity considerations:** Digital health solutions must address **digital inclusion** for older adults, people with disabilities, and underserved populations to avoid widening health disparities. [9]

## AI and early detection
- **Predictive modelling**: AI is increasingly used to analyse large-scale health data to detect early cognitive decline and predict dementia risk.[56] For example, the UK's **Our Future Health** initiative uses AI to validate biomarkers for early detection (see UK case study, pages 21-23).[57]
- **Digital cognitive testing**: Projects like **READ-OUT** (REAl-world Dementia OUTcomes) combine AI, blood biomarkers, and digital assessments to improve real-world early diagnosis.[58] [59]

## Biomarkers and secondary prevention
- **Early intervention**: Detecting dementia in its **preclinical phase (10–20 years before symptoms)** enables strategies to delay progression.[9]
- **Fluid biomarkers**: Blood biomarkers offer low-cost, less invasive alternatives to imaging, but raise ethical concerns when used in asymptomatic individuals due to risks of misdiagnosis and psychological harm.[9]
- **Evolving memory clinics:** Traditionally focused on diagnosing symptomatic individuals, memory clinics are becoming hubs for **risk assessment and prevention**, integrating digital tools and biomarkers. Emerging **Brain Health Services** in Europe exemplify this shift (see Box 2).[60] [61] [62]

## Challenges
- **Data diversity**: A major challenge for AI in dementia is the lack of diversity in training datasets, which limits generalizability and raises equity concerns. Most research has focused on populations of European origin with high socioeconomic status.[9]
- **System readiness**: Health systems must prepare for the implementation of novel disease-modifying therapies identified through advanced detection. Without adequate infrastructure, patients may face delays in accessing treatment.[9] [57]

## Box 2: Memory Clinics and the evolution into Brain Health Services

### From diagnosis to prevention
- Traditional **memory clinics** focus on diagnosing and managing cognitive impairment, including dementia and MCI.
- They are not designed for **cognitively unimpaired individuals** seeking risk reduction or cognitive enhancement.

### Emergence of Brain Health Services
- To fill this gap, memory clinics are evolving into **Brain Health Services**, targeting at-risk but unimpaired individuals (e.g., family history, genetic risk, subjective cognitive decline).
- Typically integrated within existing memory clinics, they leverage specialist expertise and infrastructure to deliver:
  - **Comprehensive risk assessment:** Lifestyle, genetic, and biomarker profiling.
  - **Personalized risk communication:** Clear, accessible messaging using visual tools
  - **Tailored risk reduction strategies:** Multi-domain interventions based on the FINGER model.
  - **Cognitive enhancement:** Activities such as cognitive training, physical exercise, and emerging techniques like non-invasive brain stimulation.

### Implementation and pilots
- The **European Task Force on Brain Health Services** has published guidance and **eight pilot sites across Europe** (e.g., Aberdeen, Amsterdam, Geneva, Stockholm) are testing feasibility and cost-effectiveness. Scotland has funded demonstrator sites under Brain Health Scotland.

### Future potential
- Long-term impact is under evaluation. Success depends on advances in biomarkers and preventive therapies to enable scalable secondary prevention. [60] [61] [62]

# Country insights

The following countries are featured as they offer valuable insights and lessons from implementing various dementia interventions. Selection was based on the availability of evidence identified through the systematic review and grey literature searches, as well as similarities to the Welsh context (e.g., health service funding models and demographic profiles). Additional targeted searches were conducted to gather more detailed information for developing the case studies.

## Finland

### Country context
- Finland faces significant demographic pressure due to its ageing population and the burden of dementia.
- **Demographics:** Finland's population is 5.6 million (2023), with 26% aged 65+.[63]
- **Dementia prevalence:** An estimated 150,000 people were living with memory disorders in 2021, with 23,000 new diagnoses annually.[64]
- **Disease burden:** Alzheimer disease and other dementias are the second leading cause of death for women (160.2 deaths per 100,000 population) and men (86.7 per 100,000).[63]
- **Costs:** Direct dementia care costs are estimated at €1 billion annually.[64]

### Policy context
Finland embeds dementia prevention within national health promotion and ageing strategies, with municipalities responsible for implementation.[65] Key policies include:
- **Government Programme (2023):** Advocates for extending healthy life years and shifting care toward prevention and early support.
- **Quality Recommendations for Active and Functional Ageing (2024–2027):** Promotes active ageing, voluntary work, technology use, and age-friendly environments.
- **National Programme of Ageing (2023):** Includes lifestyle guidance and dementia-specific measures.
- **Legislative Framework:** Memory disorders are treated as chronic illnesses under the **Act on Supporting Functional Capacity of Older Persons**, ensuring regulated elderly services.[63]

### Key interventions

1. FINGER multidomain intervention
- **Overview:** First long-term RCT to show multi-domain lifestyle interventions improve cognition in older adults at risk of dementia.
- **Design:** Two-year programme combining nutritional guidance, physical activity, and cognitive training versus general health advice.[66]
- **Outcomes:**
  - 25% greater improvement in overall cognitive function compared to controls.[66]
  - Benefits observed among APOE ε4 carriers.
  - Reduced chronic disease risk and fewer cerebrovascular events in long-term follow-up.[67]
  - Cost-effectiveness: Modelling studies suggest FINGER could deliver substantial societal benefits and be cost-effective for dementia prevention.[68]

2. Awareness and community-based prevention
- **National campaigns:** The **Finnish National Brain Health Programme** (2023) promotes brain health

across all age groups - children, working-age adults, and seniors.[69]

- **NGOs and local groups**: Alzheimer Society of Finland leads advocacy and support. Local initiatives, such as 'Memory for Health' in Ostrobothnia, provide cognitive training and education. [69]

3. **Digital tools and practical guidance**
- **Digital guidance**: 'Muistipuisto' website offers interactive brain training and lifestyle guidance.
- **National guidelines**: Accessible recommendations on nutrition, mobility, and exercise.[69]

### 4. Structural and legislative measures

Finland's public health framework uses legislation and structural policies to address key modifiable dementia risk factors:

- **Education:** Free, publicly funded education reduces socioeconomic disparities linked to dementia risk.
- **Physical activity:** Legislation promotes sports and physical activity through coordinated state-municipal cooperation and funding.
- **Alcohol regulation:** A state-owned retail monopoly (Alko), combined with high taxes and strict marketing restrictions, helps to reduce population-level alcohol consumption. [69]

# Japan

## Country context

- Japan faces one of the most severe dementia challenges globally, driven by rapid population ageing.[70]
- **Demographics:** Population 124.3 million, with 32% over 65 years.[71]
- **Dementia prevalence:**
  - Rates have risen sharply over 30 years, especially among those aged 70+. Regional disparities exist, with the Kantō region showing the highest prevalence.[72]
  - By 2030, Japan is projected to have the highest global dementia rate (43.7 per 1,000 population),[70] with 5.23 million people living with dementia and 5.93 million with cognitive impairment, around 10% of the population.[73]
- **Disease burden:** Dementia is the second leading cause of death for women (62.8 per 100,000) and tenth for men (34.8 per 100,000).[74]
- **Costs**: The high and rising numbers of dementia cases threaten to strain Japan's social, economic, and health care systems. The cost to the health system was estimated at $107.3 billion in 2014, and the cost of informal home care was $45.6 billion.[75] According to one analysis, Japan will face a yearly GDP loss of 1.46% and an economic cost of $1.76 trillion due to dementia.[76]

## Policy context

Japan has established foundational legislation and national programmes to promote inclusivity and coordinate dementia efforts across all levels:

- **Legislation:** The **Basic Act on Dementia to Promote an Inclusive Society** (2024) mandates national and local governments to create an inclusive society for people with dementia, ensuring dignity, social participation, and advancing research.[77]
- **National strategy:** Japan is among the few countries with a comprehensive dementia plan. Its **10-Year Plan** launched the Dementia Supporters programme in 2004, and Japan continues to lead global advocacy, urging G7 nations to prioritize dementia prevention and research.[78]
- **Orange Innovation Project:** Led by the Ministry of Economy, Trade and Industry, this initiative promotes inclusive product design through co-production with people with lived experience.[79]

## Key interventions

### 1. Community and social support
Japan emphasizes building widespread community awareness and support structures to ensure early intervention and maintain dignity for people living with dementia:

- **Dementia Supporters Programme**: A nationwide training initiative launched as part of Japan's '10-Year Plan' to raise public awareness and address stigma:
  - **Scale and reach**: The programme trains citizens in 90-minute seminars to become advocates for people with dementia. As of 2021, 13.3 million people have been trained. Trained supporters are identified by orange bracelets. [80]
  - **Impact**: This initiative significantly impacted public perception and served as the inspiration for similar programmes globally, such as the 'Dementia Friends' programme in the UK.[78]
- **Team Orange**: Government-led effort linking trained supporters and health professionals to provide early intervention, emotional care, and daily support for people with dementia, often in collaboration with local businesses.[81] By 2022, 495 teams were established in 220 municipalities, with the aim to form 1,700 teams by 2025.[82]
- **Local initiatives**
  - **Kayoinoba prevention programme:** This programme encourages residents to organize social activities and learning opportunities for older people to stay active, including dining, exercising, and practicing their hobbies.[81]
  - **Orange Patrols:** Volunteers in Matsudo, a Tokyo suburb, assist disoriented individuals using QR codes for identification, boosting community awareness.[55]

### 2. Multidomain intervention trial
- **Japan-Multimodal Intervention Trial for the Prevention of Dementia (J-MINT) trial:** Part of the WW-FINGERS, this 18-month RCT tested multidomain interventions (vascular risk management, physical activity, nutrition, cognitive training) in older adults with MCI.
- **Findings:** No significant effect on slowing cognitive decline, but the intervention improved several important secondary health outcomes (e.g. diet, blood pressure, physical function, hearing-related outcomes) and participants who adhered well to the intervention, especially exercise and cognitive training, did experience cognitive benefits. Further research is needed to refine interventions and identify subgroups most likely to benefit.[83]

### 3. Technology-based solutions
Acknowledging challenges such as the 19,039 dementia patients reported missing in Japan in 2023, Japan is increasingly leveraging digital tools to enhance safety and prevention:[84] [85]

- **Patient monitoring:** Kakogawa City introduced BLE tags and 'Mimamori Cameras' (safety monitoring cameras) for real-time location tracking, accessible via a free app.[86]
- **Digital cognitive screening**: Sanda City launched a *Touch de Brain* health check using the NOU-KNOW app, offering gamified cognitive assessments and links to prevention programmes.[86]

# Republic of Korea

## Country context
- The Republic of Korea is among the fastest ageing countries globally, taking only 26 years to transition from an 'ageing society' to an 'aged-society'.[87]
- **Demographics**: Population of 51.7 million (2023), with 19.5% aged 65+.[88]

- **Prevalence**: Estimated 1 million people living with dementia in 2024, up from 610,000 in 2014 (65% increase). Numbers are projected to exceed 3 million by 2050. Prevalence among adults ≥65 is 10.3% and expected to reach 15.1% by 2050.[89] [90]
- **Disease burden**: Alzheimer's and other dementias are the sixth leading cause of death overall (25 per 100,000), and fourth for women (34.6 per 100,000).[88]
- **Costs:** Annual dementia-related costs are projected to rise from 0.9% to 3.8% of GDP between 2019 and 2050.[91]

## Policy context

- The Republic of Korea, alongside Japan, is a pioneer in Asia for dementia policy, becoming the first country in the region to make dementia a national health priority.
- **National Dementia Plan**: Implemented since 2008, updated regularly. The **4th National Dementia Plan (2021–2025)** focuses on:
  - Expanding community-based dementia centres
  - Integrating dementia screening into primary care
  - Workforce development for neurologists and geriatric specialists
  - Priorities include early detection, risk reduction, and caregiver support.[92]
- The Republic of Korea operates a three-tier dementia management system, comprising the National Institute of Dementia (national level), 17 regional dementia centres, and 256 local centres delivering community-based services.[82]

## Key interventions

1. Local Dementia Centres
- **Purpose:** To provide universal access to dementia-related services for older adults, focusing on:
  - Risk reduction and early diagnosis
  - Public awareness and stigma reduction
  - Support for families and caregivers
  - Short-term care and community-based services.[55]
- **Scale**: 256 centres operate nationwide as of 2025.[93]
- **Funding**: Publicly funded through National Health Insurance and Long-Term Care Insurance.[89]
- **Services**:
  - Free cognitive screening, including referrals from national checkups for those aged 65+
  - Monitoring of high-risk groups (aged 75+, MCI, living alone)
  - Cognitive enhancement classes and risk-reduction education
  - Caregiver support, counselling, and family education.[93]

2. National Dementia Early Detection Programme
- **Overview**: Since 2010, the Republic of Korea's National Dementia Early Detection Programme has offered free cognitive screening every two years for all residents aged 60+, delivered through local dementia centres. Additionally, the National Health Insurance Service provides screening at age 66 and biennially thereafter.
- **Impact**: In 2021, 3.8 million older adults were screened, with 579,000 (15%) diagnosed with cognitive decline.[82] [94]

3. SUPERBRAIN multidomain intervention
- **Overview**: Launched in 2019 as part of the Republic of Korea's national dementia plan, the **SoUth Korean study to PrEvent cognitive impaiRment and protect BRAIN health (SUPERBRAIN)** is a nationwide lifestyle intervention for at-risk older adults.[95]
- **Features:**

- Publicly funded and free for participants
- Delivered through community centres and public health facilities nationwide.
- Part of the WW-FINGERS network, integrating cognitive training, physical activity, vascular risk management, nutrition, and motivational support.[49] [55]
- **Delivery**: Combination of in-person sessions and digital tools; facilitated by trained professionals including nurses, social workers, and dementia care specialists.
- **Outcomes**: Demonstrated improvements in cognitive function and maintenance of brain health among participants.[96] [97]

4. Investment in research
- Since the launch of the National Dementia Plan in 2008, the Republic of Korea has significantly expanded research funding, focusing on genetics, neuroimaging, and AI-based diagnostics.[98]
- Key initiatives:
  - **K-ROAD** (Korea-Registries to Overcome Dementia and Accelerate Dementia Research) **registry:** Collects ethnic-specific dementia data to accelerate research.[99]
  - **AI-powered screening tools:** Mobile app predicting dementia risk with 87% accuracy.[100]
  - **Neuroimaging integration:** Combines PET scans with genetic data to better understand disease progression.[101]
  - **Genetic discoveries:** Identification of new Alzheimer's-related genes (e.g., SORL1, APCDD1, DRC7), enabling precision medicine approaches.[101]

# Uruguay

## Country context
- Uruguay is among the fastest-ageing nations in Latin America and the Caribbean, increasing the urgency of addressing age-related conditions such as dementia.[102]
- **Demographics**: Population of 3.39 million (2023), with 17.7% aged 65+; projected to reach 22% by 2050.[103]
- **Dementia prevalence**: Estimated 50,000 people living with dementia in 2022;[55] projected to more than double to 112,000 by 2050 (107% increase).[102]
- **Disease burden**: Alzheimer disease and other dementias rank as the fourth leading cause of death for women (89.9 per 100,000) and tenth for men (36.4 per 100,000).[103]
- **Costs**: Health expenditure is projected to reach US$3.69 billion by 2050, with demographic changes accounting for 26% of this increase.[102]

## Policy context
Uruguay is a regional leader in dementia policy, characterised by early institutional action, multisectoral collaboration, and a strong focus on prevention and rights-based care.[102]
- **National Dementia Plan (2023):** Developed with the Ministry of Public Health, Alzheimer's Disease International, and local stakeholders.[104]
  Key features:
  - Risk reduction targeting hypertension, diabetes, smoking, inactivity, and social isolation
  - Brain health education in schools
  - Anti-ageism training and awareness campaigns within the health sector to reduce stigma.
  - Caregiver support networks and mental health services
  - Development of data infrastructure for dementia surveillance.[105]
- **Brain Health Unit (2020):** First in Latin America, housed within the Ministry of Health to coordinate dementia policy and research.[105] [102]

- **Long Term Care National System (2015):** Promotes autonomy and prioritizes home-based care over institutional care.[106]
- **National Programme for the Elderly:** Focus on healthy, active ageing and age-friendly health services.[107]

## Key interventions
- **Brain health education in schools:** Uruguay is one of the few countries to include brain health promotion in school curricula, promoting lifelong cognitive health and injury prevention (e.g., reducing head trauma in football).[55]
- **Data and digital health infrastructure**: Uruguay's National Dementia Plan includes plans for advanced data systems to improve dementia surveillance and care. Building on its national digital health programme 'Salud.uy', key components include:[108]
    - Unified electronic health records for continuity of care
    - National health data bank for epidemiological monitoring
    - Tele imaging for remote diagnostics
    - Integrated health network for real-time data sharing and coordinated care.[109]
- **Multidomain intervention trial:** Uruguay participates in **LatAm-FINGERS**, the first regional adaptation of the Finnish FINGER study, testing a 24-month lifestyle intervention (diet, exercise, cognitive training, vascular risk monitoring) across 12 countries.[110]

# United Kingdom

## Country context (UK-wide)
- **Demographics**: The current population of United Kingdom of Great Britain and Northern Ireland is 68.7 million (2023), with 21.4% aged 65+.[111]
- **Dementia prevalence**:
  Approximately 944,000 people in the UK are living with dementia, projected to reach 1 million by 2030 and 1.6 million by 2050.[112] Women account for 65% of cases. Individuals from lower socioeconomic backgrounds and those with learning disabilities are up to three times more likely to develop dementia at an earlier age. Dementia incidence is over 20% higher among Black adults compared to the UK average.[112]
- **Disease burden**: Dementia was the leading cause of death across the UK in 2022, responsible for 74,000 deaths (11.3% of all deaths).[113] It is the top cause of death for women (165.1 per 100,000), and third for men (89.9 per 100,000).[111]
- **Economic cost:**
  Dementia costs the UK £25 billion annually (2024), projected to rise to £30 billion by 2030 and £47 billion by 2050. The largest share of dementia-related costs come from unpaid caregiving and social care services.[114]

## Country context (Wales)
- **Prevalence**: Welsh Government estimates 42,000 aged 65+ live with dementia, predicted to rise by 37% to nearly 70,000 people by 2040.[115]
- **Economic burden:** Dementia-related costs in Wales total £2.3 billion (2024), mainly driven by unpaid family care and social care. This figure is projected to reach £4.6 billion by 2040.[115] [116]

# Policy context (UK nations)

## Wales
1.  **Dementia Action Plan for Wales** (2018-2022):
- Aimed to make Wales a dementia-friendly nation, through person-centred care, integrated services, and prevention. Updated during COVID-19 to strengthen service provision.[115][116]
- Delivery is being advanced through the **National Dementia Care Standards (2021)**: National and regional workstreams focus on community engagement, memory assessment, dementia connectors, dementia-friendly hospital care and workforce development.
- **Funding:** £12.7 million annually to Regional Partnership Boards for implementation.[117]
- **Evaluation:** Reported improvements in multi-disciplinary working, memory assessment services, and strategic prioritisation.[118]
- Work is underway on a successor plan.[117]

2.  **Associated frameworks and initiatives:**
- **Prevention-Based Health and Care Framework (2025)** for systematic prevention planning.[119]
- **Cardiovascular Disease Prevention Plan for Wales (2025): An ABCD Plus Approach**, a prevention-focused strategy to identify and support those at highest risk of CVD.[120]
- **All-Wales Dementia Hearing Loss Pathway** for equitable audiology care.[121]
- Allied Health Professionals Dementia Framework (2022) to support people living with dementia, their carers, and communities to stay physically, cognitively, and socially active.[122]

## England
- Currently lacks a national dementia strategy, prompting calls for a comprehensive plan.[123][124]
- **NHS Operational Planning Guidance for 2025/26:** Removed dementia diagnosis rate targets and other specific dementia priorities.[123][125]
- **10-Year Health Plan:** Signals major changes for dementia care, diagnosis and prevention, including: improved GP access and digital tools (NHS App); 'Modern Service Framework' for dementia care standards; research investment via Dame Barbara Windsor Dementia Goals Programme; faster clinical trials and an 'Innovator Passport' for new technologies; prevention focus on smoking, diet, inactivity, and personalised risk information.[126]

## Scotland
- **10-year dementia strategy (2023):** 'Everyone's Story', emphasizes empowerment, inclusivity, and rights-based care.[127]
- **Delivery Plan (2024–2026):** Priorities include digital innovation, equity, and rights-based care.[128]
- Initiatives include support for Virtual Reality therapy through Alzheimer Scotland, and integration of dementia into the Digital Health and Care Strategy.[128]

## Northern Ireland
- **Regional Dementia Care Pathway (2022):** Co-developed with people with lived experience, seeks to implement recommendations from the **2011 Northern Ireland Dementia Strategy.**
- Focuses on timely diagnosis, person-centred support, and consistent care standards.[129]

# Key interventions and research (UK-wide)

## 1. Public awareness and engagement campaigns

### Dementia Friends
- **Overview**: UK-wide initiative led by Alzheimer's Society and funded by the Cabinet Office and Department of Health, inspired by Japan. Aims to improve public understanding of dementia, reduce stigma, and create dementia-friendly communities.[130]
- **Delivery and partnerships:** Online videos, face-to-face sessions, and outreach; collaborates with major organisations (e.g., Iceland, Boots, British Gas), schools, and emergency services.
- **Impact**: 3.8+ million people joined; 9,000+ volunteer Champions delivering sessions.[130]

### Think Brain Health campaign (Alzheimer's Research UK)
- **Overview**: National public awareness initiative launched in 2021, to reframe dementia prevention through the lens of brain health.[131]
- **Focus**: Promotes lifestyle changes to reduce dementia risk (mental activity, heart health, social connection), targeting adults in their 40s and 50s.[131][132]
- **Delivery**: Digital tools (e.g. Brain Health Check-in), educational resources, and media campaigns.[133] Advocates for policy change, including NHS Health Check reform and tackling environmental risks like air pollution.[134]

### NHS Health Check programme
- **Overview**: Since 2018, England's NHS Health Check programme has integrated dementia prevention into routine health assessments for adults aged 40–74.[135]
- **What it offers:** Free check every 5 years via GPs or local councils; 20–30 min assessment: body measurements, blood tests, lifestyle review; advice on brain health, risk factors, and signposting for those 65+.[135][136]
- **Impact**: Reached 41% (6.4 million) of eligible people between 2015 and 2020; £2.93 return per £1 invested; projected to reduce absolute health inequality by 2040.[137]

## 2. Research and innovation

### APPLE TREE (Active Prevention in People at risk of dementia through Lifestyle, bEhaviour change and Technology to build REsiliEnce)
- **Purpose:** Tests how lifestyle, behaviour change, and technology can help prevent dementia and build resilience in at-risk individuals.[50]
- **Focus:** Scalable intervention for people with MCI or memory concerns, builds on FINGER.[138]
- **Delivery:** RCT in England; targets five modifiable risks (diabetes, inactivity, isolation, depression, smoking); designed for non-expert delivery and NHS scale-up.[139]
- **Funding:** ESRC-funded; led by Queen Mary University with NHS and academic partners.[50]
- **Outcomes**: Early evidence of improved knowledge, behaviour change, and social connection.[140]

### Our Future Health and UK Dementia Research Institute
- **Goal:** Building the UK's largest health research cohort (up to 5 million participants) to enable early dementia detection and prevention.[141]
- **Focus:** AI and blood biomarkers; multi-source data (genetic, clinical, lifestyle).[141]
- **Funding and partnerships**: £600 million+ awarded by UKRI, life sciences companies and charities; partners include NHS, pharma, charities.[142][143]
- **Expected outcomes**: Transform dementia diagnosis timelines (92% within 18 weeks by 2029); support NHS planning for scalable early interventions.[144]

## SPIINNET (Sustainable Prevention, Innovation and INvolvement NETwork)

- **Goal**: Community-driven research to reduce dementia risk and improve quality of life.[145]
- **Funding and partnerships**: £1.7 million (ESRC, NIHR, Alzheimer's Society); led by UCL and Exeter with 14 universities.
- **Expected outcomes:** Inclusive prevention strategies; sustainable research ecosystem.[145]

## READ-OUT project (Real-world Dementia Outcomes)

- **Goal:** Validate blood-based biomarkers for early dementia diagnosis and enable NHS implementation.[59]
- **Delivery:** Nationwide blood sampling at 29 UK sites.
- **Funding:** £4.5million (Alzheimer's Society, Alzheimer's Research UK, NIHR, Gates Ventures).
- **Expected outcomes:** Faster, cheaper, non-invasive testing. [59] [146]

## Dementia board games (University of Liverpool)

- **Goal:** Raise awareness and understanding of dementia across generations through interactive, co-produced board games:
  - Dementia Explorer: For children (ages 7–11) to learn about dementia and risk factors in an engaging, age-appropriate way.[147]
  - Dementia Inequalities: Exploring barriers and solutions for carers, professionals and students.[148]
- **Impact:** Knowledge gains in 318 students; potential for wider health and social care training.[149]

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