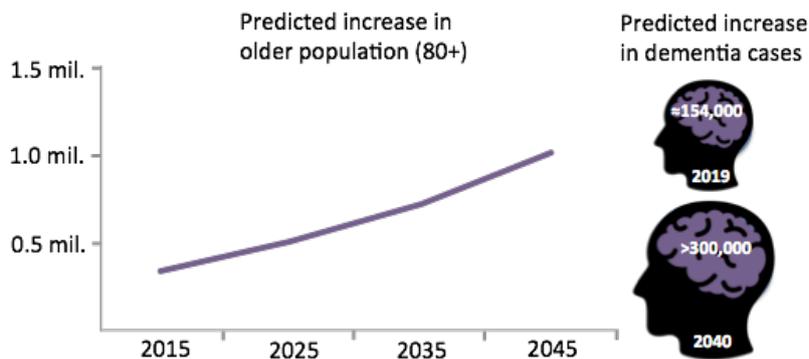
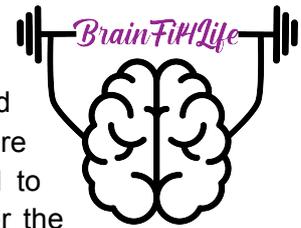


## BrainFit4Life: seeking a brighter future for you and your loved ones

Advances in medicine and improved healthcare in Switzerland, as well as worldwide, have led to an unprecedented increase in life expectancy in recent years. In 2000, 15% of the population was aged 65+. This has now increased to 19% (2020)<sup>1</sup>. More and more people are living to meet their grandchildren and even great-grandchildren and to experience a long and healthy older age. It is imperative to empower the people to extend their brain health to live better and fitter for longer.



While a slowing of brain function is a classic sign of old age, dementia goes far beyond this, causing a serious decrease in quality of life. Dementia is not caused by a single disease but is rather a symptom of a number of underlying processes. The most common cause

of dementia is Alzheimer's disease, which accounts for up to 70 % of dementia cases in the aging population<sup>2</sup>. While cognitive disability and loss of function are the most well-known symptoms of dementia, the disease starts decades earlier in a prolonged asymptomatic phase that has potential for targeted intervention.

In Switzerland and across the world, cases of dementia are rapidly increasing. Almost 30,000 people developing dementia each year in Switzerland means that **every 18 minutes one individual becomes affected by this devastating neurological condition**. Being female increases the chance of becoming demented (**twice as many women than men** suffer from Alzheimer's disease), and women are more likely than men to care for people with dementia. The emotional costs that accompany dementia are unquantifiable, but the socio-economic burden dementia causes on families is enormous.

**Aging of the Swiss population <sup>1</sup>:**  
Percentage of the population aged 65+  
2000: 15%  
2020: 19%  
2040: 25 % (predicted)

**Dementia cases in Switzerland <sup>3</sup>:**  
Current number cases: 154,000  
Expected number of cases in 2040: 300,000

**Dementia costs in Switzerland <sup>4</sup>:**  
Total costs per year: 11.8 billion CHF  
Direct costs: 6.3 billion CHF (53%)  
Indirect costs: 5.5 billion CHF (47%)

It was recently estimated that the total annual cost of dementia in Switzerland is 11.8 billion CHF<sup>4</sup>. Of all costs, approximately half are direct costs, meaning visits to the doctor, hospitalizations, diagnostics, drugs and home care from Spitex, etc. The remaining costs, a total of approximately 5.5 billion CHF, are indirect costs, meaning unpaid care provided by family and friends of those with dementia. These figures are extraordinarily high, making dementia the most costly chronic condition of all!

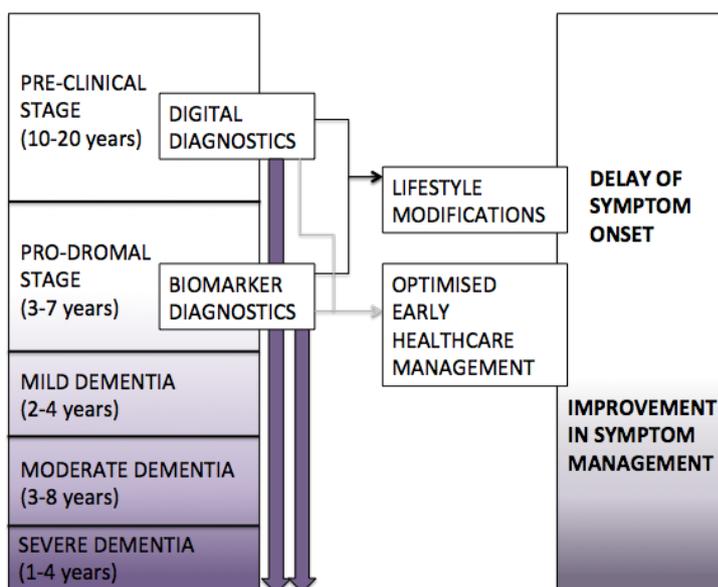
Dementia is a difficult subject for many people, with stigma and denial of symptoms preventing many people from being diagnosed. **A lack of diagnosis unfortunately does not stop the progression of disease. It does not prevent the relentless increase in disease cases, nor does it decrease the financial costs of the disease.** Any treatment or prevention strategy — including ones that will emerge in the future from research being conducted today — needs to be implemented as early as possible, when the patient still has a lot of healthy brain cells to preserve. Early diagnostics offer great potential for developing future therapeutic strategies aimed at halting the progression of the disease early on. But even in the absence of therapeutics, a brain health forecast offers tangible benefits as (a) it allows patients to be more involved in care choices; (b) it gives families more time to plan; (c) it avoids problems associated with delayed dementia diagnosis, like financial abuse, social isolation, etc.<sup>5</sup>. For all these reasons, early diagnosis is paramount.

**Contribution of lifestyle modifiable factors to overall dementia risk:**

**Risk factor contribution<sup>6</sup>: Numbers in Switzerland:**

Smoking, 6%:	31% ♂ smoke 23% ♀ smoke <sup>7</sup>
High blood pressure, 2%:	19% ♂ have high blood pressure 16% ♀ have high blood pressure <sup>8</sup>
Depression, 4%:	8% ♂ report major depression 10% ♀ report major depression <sup>9</sup> 29% ♂+♀ report at least mild depression <sup>10</sup>

The good news is that lifestyle measures could reduce the risk of dementia. Smoking and high blood pressure, as well as depression and a lack of social interaction, have been shown to be linked to dementia risk<sup>6</sup>. While countering some of these risk factors is certainly not trivial, the potential benefits in terms of prolonging brain fitness are considerable.



**Preventive measures and early diagnosis of populations at risk has great potential for reducing the prevalence of dementia, granting people a healthier and happier late life.** It is estimated that early prevention may delay the onset of dementia by five years or more, potentially halving the number of cases and the costs associated with this condition<sup>2,6</sup>.

Dementia is an active research topic in Switzerland. The National Dementia Strategy (2014-2019) has pushed for improved care of patients and their families. This work and research into different aspects of dementia have also been supported by the continuous commitment and financial support of Alzheimer Schweiz and the Synapsis Foundation. Furthermore, regional programs have been recently launched to implement preventive strategies for patients with cognitive decline. CAREMENS, for example, offers cognitive and physical therapies for mild cognitively impaired subjects in all Memory clinics of Western Switzerland<sup>11</sup>.

### **The request of the BrainFit4Life Task Force:**

Despite all these efforts, as a group of experts on brain health and disease, we are convinced that there is a huge opportunity to enhance the impact of clinical research for understanding and efficiently treating dementia. Therefore, we call the Swiss authorities to respond to the following requests:

1. Support for **a national brain health registry** based on the principles of data federation

The expertise of basic and clinical neuroscientists, along with the unique public-health system and IT infrastructure in Switzerland, should be capitalized on to create a federated system that empowers researchers from various domains to use data collected for diagnostic purposes under strict protection of privacy. This idea has already been pioneered by the MemoNet consortium<sup>12</sup>, which aims to improve individuals' diagnosis of memory dysfunction and provides a federation of clinical data across Swiss universities. We wish to expand this network to become nation-wide and to serve as a supporting and training tool for informed clinical diagnosis. A nation-wide MemoNet will increase the predictive and diagnostic power of the collected data. Finally a national brain health registry will serve an exemplary data-driven personalized medicine engine at the service of civil society.

2. The design of a tailored **brain health program**

More and more data are emerging relating to modifiable risk factors that contribute to the likelihood of developing dementia and the age at which clinical symptoms develop. Some of the risk factors fall under the umbrella of a healthy lifestyle and are in the minds of the general public as also being risk factors for other diseases. Therefore, a structured prevention program is necessary to ensure that everything possible is done to aid the population in reducing all possible risks. Fitting hearing aids in those diagnosed with hearing loss, for example, has been shown to be associated with a reduced incidence of dementia<sup>13</sup>. In Switzerland, the high healthcare standards represent a solid foundation to implement a federal preventive dementia strategy under the umbrella of the first global randomized control trial called worldwide FINGERS<sup>14</sup>. Besides the positioning of Switzerland in this global trial program, Swiss citizens will profit substantially from the multi-domain intervention with exercise, diet, cognitive and social stimulation and management of vascular/metabolic risk factors benefiting cognition in subjects at risk of dementia.

3. A focus towards **early memory diagnostics** to identify people at risk

Any diagnosis, however late, is better than no diagnosis. Yet in terms of securing appropriate medical and social care, only early diagnosis during the pre-clinical phase and asymptomatic phase holds potential for modification of disease progression. Recent

technological developments and the use of digital tools in healthcare allow the support of such tools for earlier and more reliable diagnosis and for more objective patient monitoring over time. Furthermore, particularly in the technology-rich environment of Switzerland, such tools may become capable of estimating drug efficacy in a personalized manner, and digital therapeutics may be used as targeted, interventions to slow cognitive decline and maintain the patient's independence for longer. We believe that the use of early diagnosis should become more widespread, so that appropriate support may be made available to those diagnosed. Dementia screening at an annual check-up should be considered for those over 60 years of age, and insurance companies may need to provide patient journey packages in which dementia patients are cared for in an integrated solution over time.

#### 4. A **public awareness campaign** to increase understanding of dementia

The above measures, especially including early diagnosis and a dementia prevention program, can only be effective if those working in the medical profession (both specialists and general practitioners) and also the public are provided with accurate and clear information about the advantages of lifestyle changes and of early diagnosis. A better understanding of brain aging will increase the awareness about preclinical symptoms, and the adoption of early treatment. Furthermore, focusing on brain health on the long term will improve the quality of life and lead to better acceptance of aging-related conditions while reducing stigma surrounding dementia. Capitalizing on the work that Alzheimer's Switzerland has done over the years in the public dissemination, we see a time when experts, medical practitioners, and caregivers closely work together to inform the public and help them overcome fears and stigma associated with the conditions.

The implementation of these four points, which will be carried out in concert with Alzheimer Schweiz, is essential if the dementia landscape in Switzerland is to be improved. Better patient care and support are vital, but developing tailored treatments and preventive strategies will eventually reduce the incidence of dementia, benefiting the population and reducing the socioeconomic costs. Switzerland has an ideal landscape for realizing the goals of the task force. It is a hub for innovation and high-level clinical and experimental research and has an exemplary healthcare system. It already possesses a tight network of successful memory clinics, and together with its strong infrastructure and funding bodies, large presence of pharmaceutical companies, tech startups, civil society efforts, and nursing homes. Only with dedicated investment and long-term commitment from the federal government to implement the Strategic Research Plan for Brain Aging can the impact of the Swiss medical and technological landscape be maximized to the benefit of its citizens.

#### **References**

<sup>1</sup> Population change scenarios for Switzerland (Federal Statistics Office): available at <https://www.media-stat.admin.ch/animated/chart/01pyramid/ga-q-01.03.02-dashboard.html>

<sup>2</sup> Global action plan on the public health response to dementia 2017–2025. Geneva: World Health Organization; 2017. Licence: CC BY-NC-SA 3.0 IGO.

<sup>3</sup> Demenz in der Schweiz 2019: Zahlen und Fakten: Alzheimer Schweiz.

<sup>4</sup> Begey, K., Wissensmanagement, L. & Geschäftsleitung, M. der. Steuergruppe Alzheimer Schweiz. Alzheimer Schweiz Demenzkostenstudie 2019: Gesellschaftliche Perspektive

<sup>5</sup> Alzheimer's Disease International. 2019. World Alzheimer Report 2019: Attitudes to dementia. London: Alzheimer's Disease International.

<sup>6</sup> Livingston, G. *et al.* Dementia prevention, intervention, and care. *Lancet* 390, 2673–2734 (2017).

<sup>7</sup> Zahlen & Fakten: Tabak, Federal Statistics Office. Available at <https://www.bag.admin.ch/bag/de/home/zahlen-und-statistiken/zahlen-fakten-zu-sucht/zahlen-fakten-zu-tabak.html>

<sup>8</sup> Herz- und Kreislauf-Erkrankungen, Federal Statistics Office. Available at <https://www.bfs.admin.ch/bfs/de/home/statistiken/gesundheit/gesundheitszustand/krankheiten/herz-kreislauf-erkrankungen.html>

<sup>9</sup> Psychische Gesundheit, Federal Statistics Office. Available at <https://www.bfs.admin.ch/bfs/de/home/statistiken/gesundheit/gesundheitszustand/psychische.html>

<sup>10</sup> Major Depression nach Alter, Geschlecht, Sprachgebiet, Bildungsniveau, Federal Statistics Office. Available at <https://www.bfs.admin.ch/bfs/de/home/statistiken/gesundheit/gesundheitszustand/psychische.assetdetail.303610.html>

<sup>11</sup> <https://promotionsante.ch/pds/cycle-de-soutien-2019/esquisses-de-projets-choisis.html>

<sup>12</sup> Draganski et al. (2019) A nationwide initiative for brain imaging and clinical phenotype data federation in Swiss university memory centres. *Current Opinion in Neurology* 32(4):557-63.

<sup>13</sup> Mahmoudi, E. et al. (2019) Can Hearing Aids Delay Time to Diagnosis of Dementia, Depression or Falls in Older Adults? *Journal of the American Geriatric Society*, 67(11): 2362-69.

<sup>14</sup> World Wide Fingers. Available at: <http://alz.org/wwfingers>.

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