



Institute
and Faculty
of Actuaries

Dementia and insurance: cognitive protection

Matt Singleton
Swiss Re



11 March 2020

Cognitive protection

- Dementia: it's **not** [only] **Alzheimer's** and we **don't know much**
- Genetic, lifestyle and environmental **risk factors** exist
- There's growing evidence **we can prevent / postpone** its onset
- The future sees **better intervention** and "**early warning**" systems
- Insurance has a **role to play** today and in **the future**



Institute
and Faculty
of Actuaries



Institute
and Faculty
of Actuaries

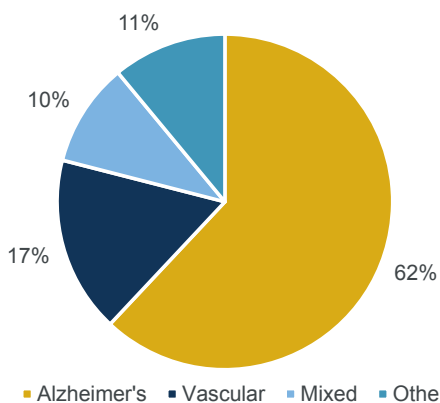
Dementia

It's not [only] Alzheimer's and we don't know much

Dementia:

Many causes, common symptoms

Causes / types of dementia and approximate % of cases attributed²



Dementia is a syndrome due to **disease of the brain** – usually of a **chronic or progressive** nature – in which there is **disturbance** of multiple higher **cortical functions**, including memory, thinking, orientation, comprehension, calculation, learning capacity, language, and judgement¹.



Institute
and Faculty
of Actuaries

¹ World Health Organization, 2012; ² Alzheimer's Society, UK – UK figures

LATE entry

Limbic-predominant Age-related TDP-43 Encephalopathy

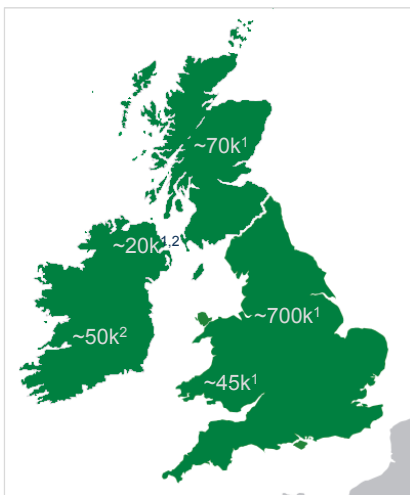


Institute
and Faculty
of Actuaries

Peter T Nelson, Dennis W Dickson et al (2019) Limbic-predominant age-related TDP-43 encephalopathy (LATE): consensus working group report, Brain, Volume 142, Issue 6, June 2019, Pages 1503–1527, <https://doi.org/10.1093/brain/awz099>

5

High costs; growing prevalence



- Approx 900k people living with dementia in the UK and Ireland^{1,2}
 - >2m by 2050¹
- USD 715bn pa spent in high income countries
 - 85% apportioned to social care
 - Half of social care provided by family³
- Delaying onset of dementia by 2 years across population would reduce costs by ~15% by 2030¹



Institute
and Faculty
of Actuaries

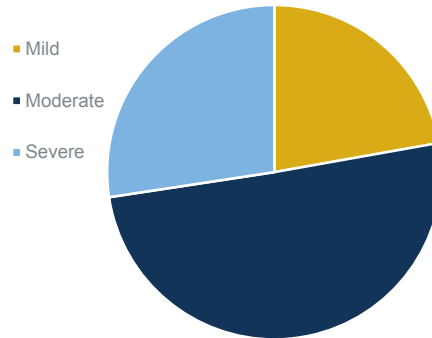
¹ Alzheimer's Society, UK 2013-17; ² Institute Public Health, Ireland 2017; Alzheimer's Disease International, 2015

6

Mortality and dementia

"Of the cohort [1,400 subjects], 22.2% (95% confidence interval 20.1, 24.5) died with mild dementia; 50.4% (47.8, 53.0) moderate; and 27.4% (25.1, 29.8) with severe dementia."

Proportion of deaths at each dementia stage



Institute and Faculty of Actuaries

Aworinde, J., Werbeloff, N., Lewis, G. et al. (2018) Dementia severity at death: a register-based cohort study. BMC Psychiatry 18, 355 (2018) doi:10.1186/s12888-018-1930-5



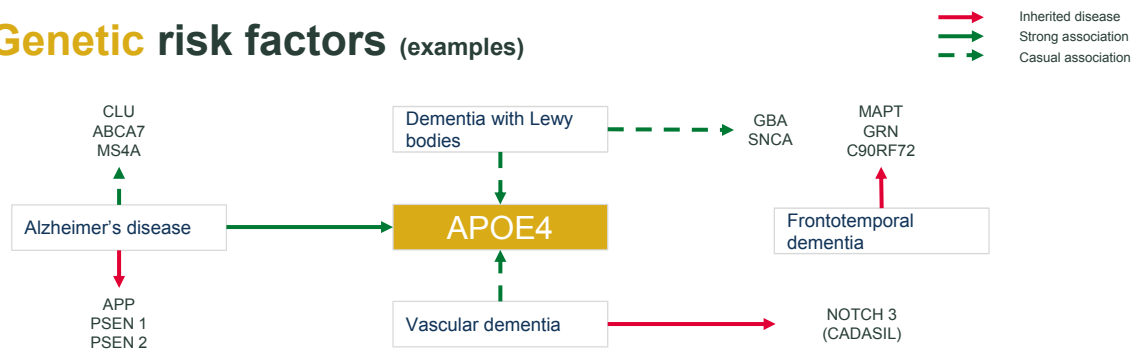
Institute and Faculty of Actuaries

Dementia

Genetic and environmental factors exist



Genetic risk factors (examples)



The APOE4 allele story

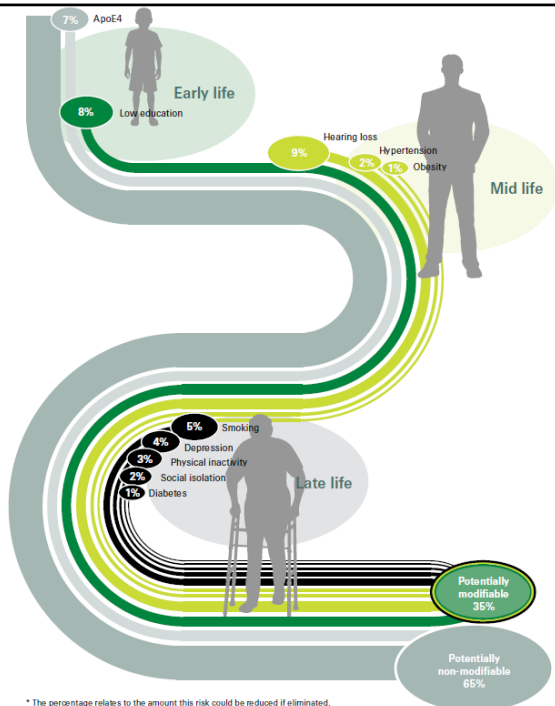
Zygosity	Mean age of diagnosis	Allele frequency in US / UK	Alzheimer's likelihood
Homozygous	68 years	2%	3-5x
Heterozygous	76 years	25%	2x
Non-carriers	84 years	73%	



Riedel et al., 2016; Allele frequency: Alzheimer's Association, 2017; Likelihood and genes: Alzheimer's Society, UK, accessed June 2018

9

Risk factors throughout the **lifecourse**



* The percentage relates to the amount this risk could be reduced if eliminated.

Livingston et al (2017), Dementia prevention, intervention, and care, *The Lancet*



10



Institute and Faculty of Actuaries

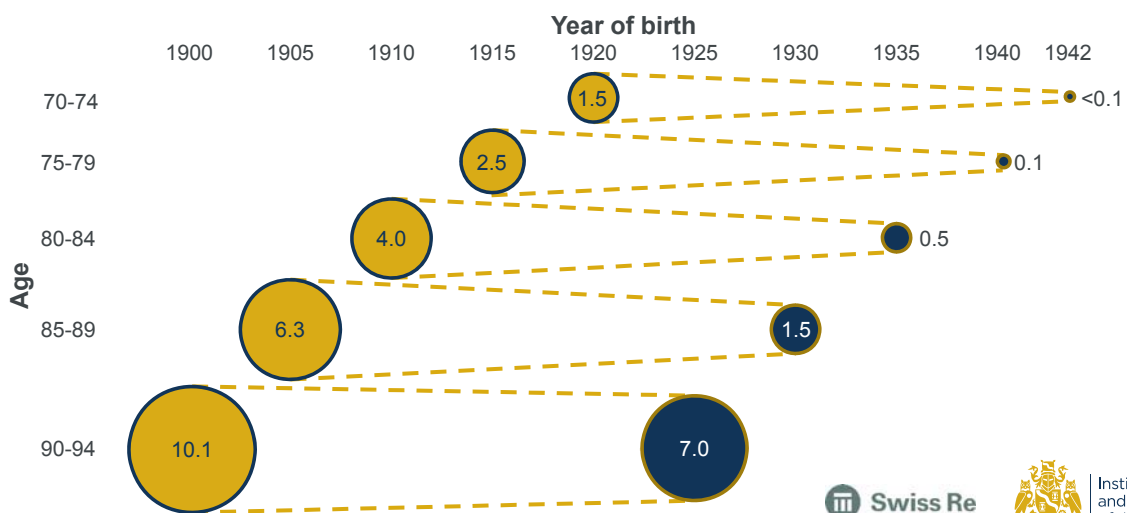
Dementia

There's growing evidence we can prevent / postpone its onset



Incidence has fallen in many geographies

● Incidence per 100 person years (US)



Institute and Faculty of Actuaries

Adapted from Derby CA, Katz MJ, Lipton RB, Hall CB. Trends in Dementia Incidence in a Birth Cohort Analysis of the Einstein Aging Study. JAMA Neurol. 2017;74(11):1345–1351. doi:10.1001/jamaneurol.2017.1964

Reducing risk of dementia



“Cognitive reserve”: stay mentally active



Drink alcohol in moderation



Address hearing loss



Maintain a healthy weight



Take regular exercise



Don't smoke



Eat a healthy, balanced diet



Participate in social activities



If APOE4: be Nigerian or APOE 2?



Institute and Faculty of Actuaries

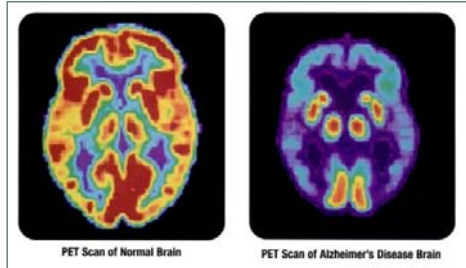


Institute and Faculty of Actuaries

Dementia

The future sees better intervention and “early warning” systems

Simple blood test



Plasma biomarkers are significantly correlated with brain $A\beta$ burden and CSF [cerebrospinal fluid] - $A\beta$ 1-42 level



Institute and Faculty of Actuaries

A Nakamura et al. *Nature* 554, 249-254 (2018) doi:10.1038/nature25456

15

Cognitive testing apps

Regular testing for:

Instant verbal memory

Delayed verbal memory

Attention

Focus

Impulse control

Spatial memory

Emotion identification

Information processing

Working memory

Executive function

Flexible thinking

Potential applications:
 • Assessment
 • Disease mgmnt

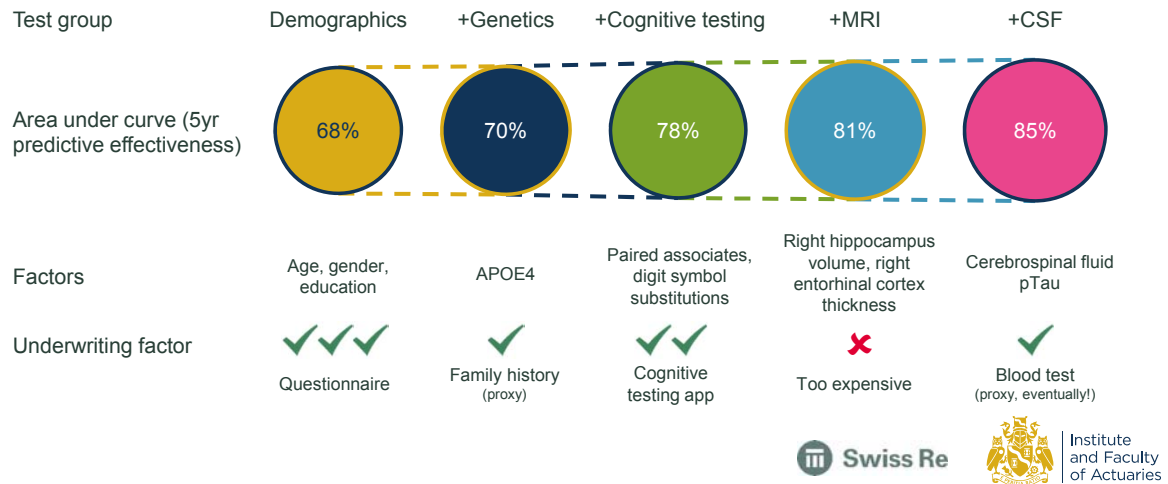


Institute and Faculty of Actuaries

Categories taken from savonix.com

16

Predicting who will develop mild cognitive impairment / Alzheimer's disease



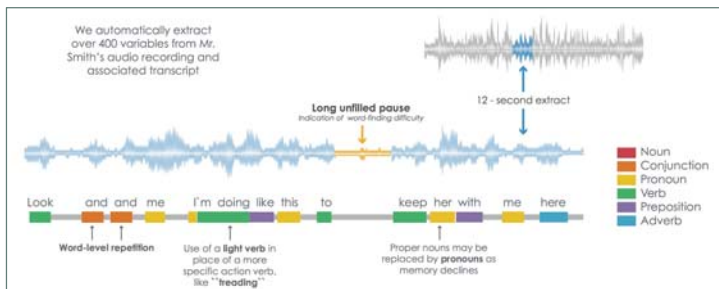
Adapted from Marilyn Albert, Yuxin Zhu, et al; Predicting progression from normal cognition to mild cognitive impairment for individuals at 5 years, Brain, Volume 141, Issue 3, 1 March 2018, Pages 877–887, <https://doi.org/10.1093/brain/awx365>

17

There came a day when **Iris laid her hand on Puss's knee** and said,
 "Susten poujin drom **love** poujin? Poujin susten?"

Example – voice recognition via Winterlight Labs

People with Alzheimer’s have word finding difficulties which results in **longer pauses between words**, more hesitation, using **more pronouns and fewer nouns** (e.g. “her” instead of “Rita”) and using **less complex words** (e.g. “car” instead of “sedan”). In contrast, a person with **Parkinson’s disease** or **Multiple Sclerosis sounds different** but might use the same language as a neurologically healthy senior.



Institute and Faculty of Actuaries

Taken from winterlightlabs.com

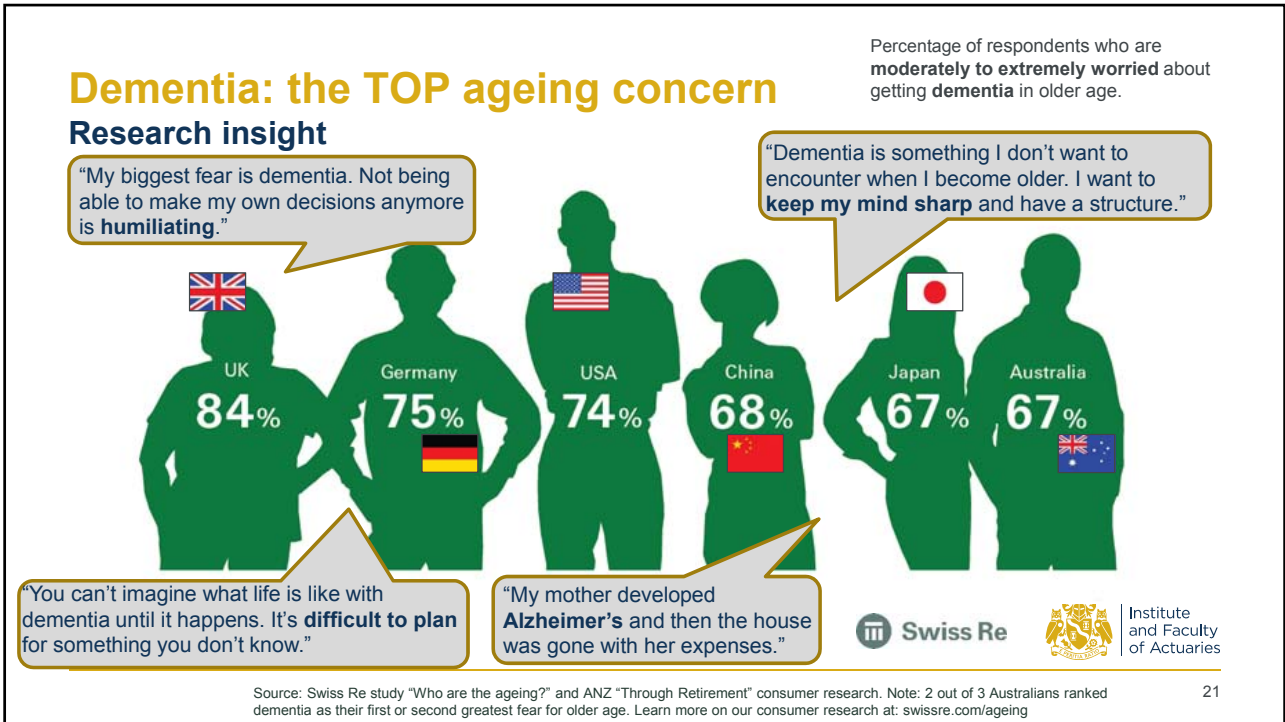
19



Institute and Faculty of Actuaries

Dementia

Insurance has a role to play today and in the future



What can insurance do today?

- Resist the urge to “solve everything”
- Provide value-added, relevant services – “payouts plus”
- Build affordable, consumer-led solutions

Swiss Re | 22

Insurance can help today, but it's the future that's exciting.



Institute
and Faculty
of Actuaries

23

Questions

Comments

The views expressed in this [publication/presentation] are those of invited contributors and not necessarily those of the IFoA. The IFoA do not endorse any of the views stated, nor any claims or representations made in this [publication/presentation] and accept no responsibility or liability to any person for loss or damage suffered as a consequence of their placing reliance upon any view, claim or representation made in this [publication/presentation].

The information and expressions of opinion contained in this publication are not intended to be a comprehensive study, nor to provide actuarial advice or advice of any nature and should not be treated as a substitute for specific advice concerning individual situations. On no account may any part of this [publication/presentation] be reproduced without the written permission of the IFoA [or authors, in the case of non-IFoA research].



Institute
and Faculty
of Actuaries

24

©2020 Swiss Re. All rights reserved. You are not permitted to create any modifications or derivative works of this presentation or to use it for commercial or other public purposes without the prior written permission of Swiss Re.

The information and opinions contained in the presentation are provided as at the date of the presentation and are subject to change without notice. Although the information used was taken from reliable sources, Swiss Re does not accept any responsibility for the accuracy or comprehensiveness of the details given. All liability for the accuracy and completeness thereof or for any damage or loss resulting from the use of the information contained in this presentation is expressly excluded. Under no circumstances shall Swiss Re or its Group companies be liable for any financial or consequential loss relating to this presentation.



Institute
and Faculty
of Actuaries