

somewhat
different



Longevity Protection

Guaranteed Income for Life

Dr. Claudia Ingrid Prévôt , Hannover Re L&H, Sweden

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Key facts about Hannover Re



Founded by HDI
(P&C reinsurance only)

1990



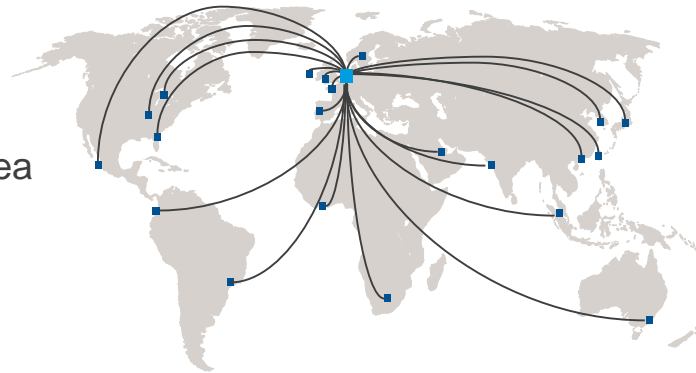
Start of L&H reinsurance
as strategic growth segment

1994



Initial Public Offering
of Hannover Re

Legal form as a Societas Europaea
Hannover Rück SE since 2013



>140 subsidiaries, branches/
representative offices **worldwide**



4th largest reinsurer
in the world

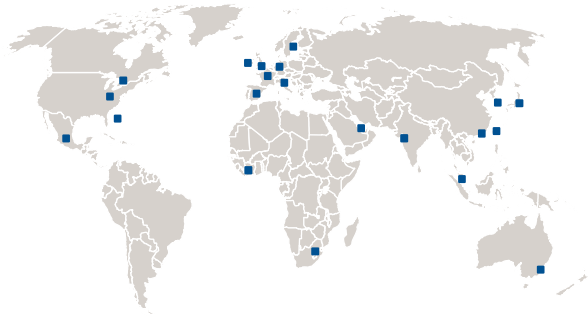


Total staff of
~3,300 employees



Majority shareholder:
50.2% held by **Talanx AG**

In brief: L&H business group



25

Offices

~900

Experts

EUR 364 m.

VNB

EUR 7.1 bn.

GWP

EUR 245 m.

EBIT

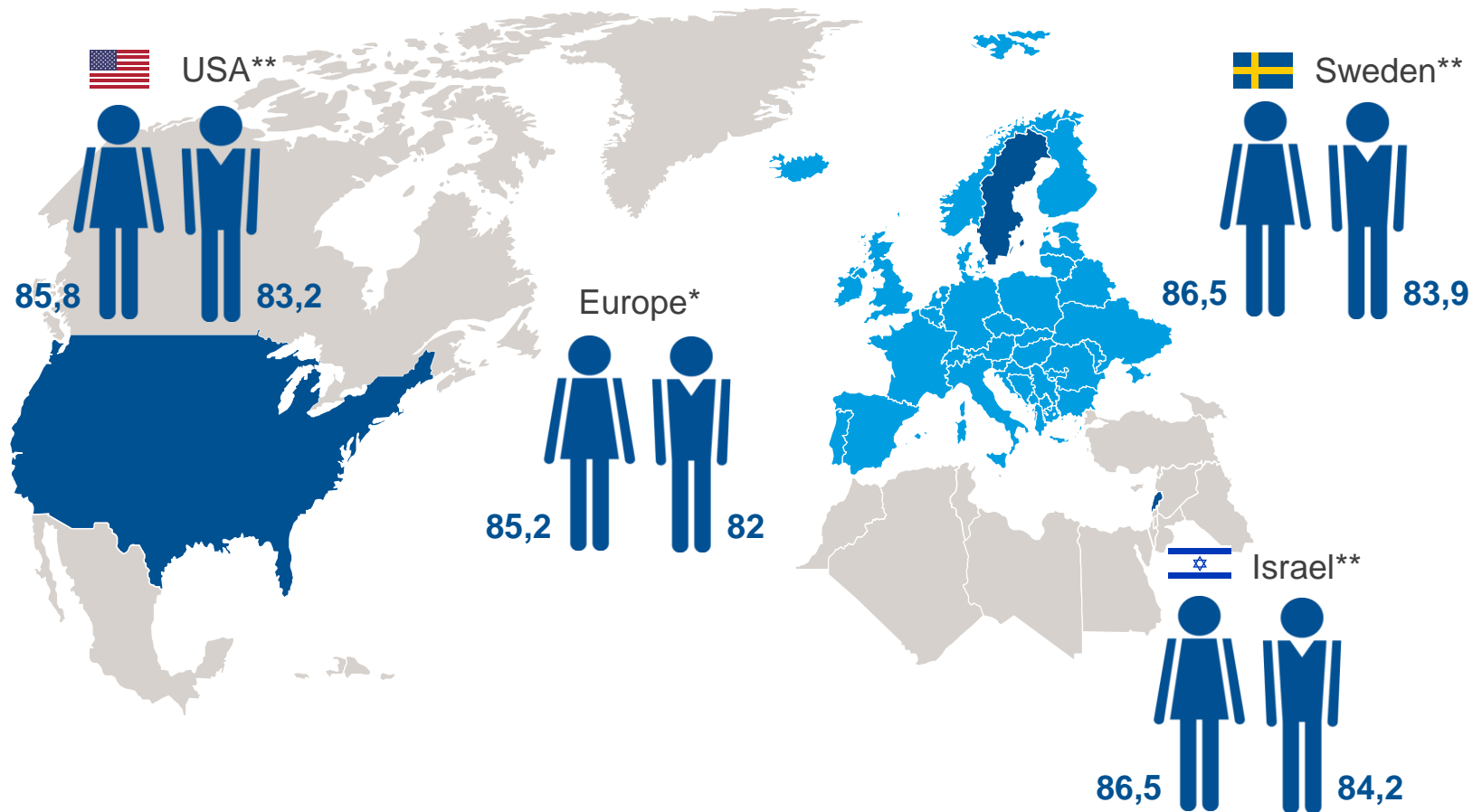
Hannover Re's background

in the longevity market

- ▶ One of the first players in the Regular Premium Annuity Treaties (RPATs) market
- ▶ Market-leader in the Enhanced Annuity market
- ▶ Volume of RPATs written until today: approximately £18bn
- ▶ Expertise in reinsurance products for longevity risk also extends to non-UK markets



Total Life Expectancy at age 65

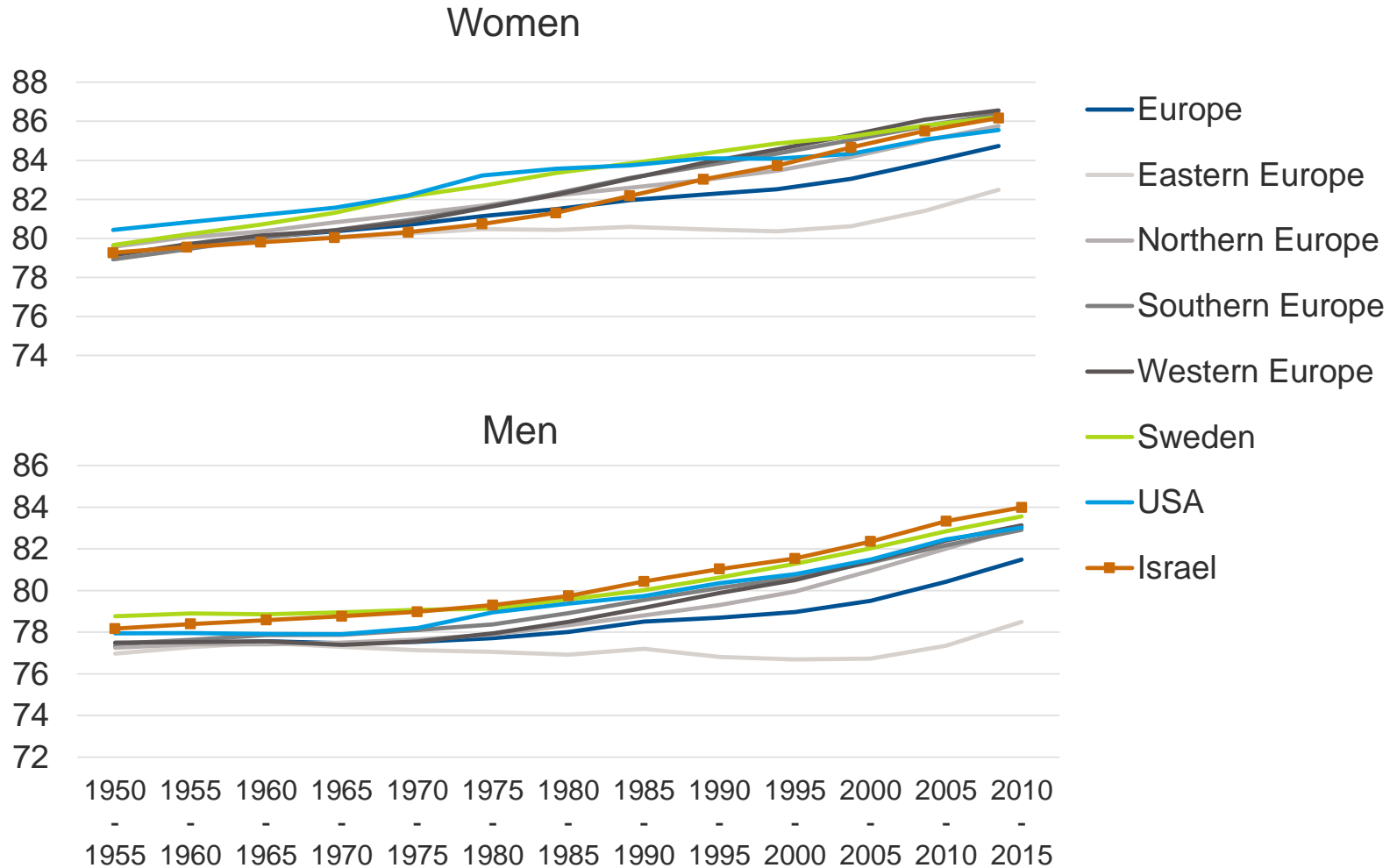


Source:

* United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision

**Human Mortality Database (HMD), <https://www.mortality.org/>

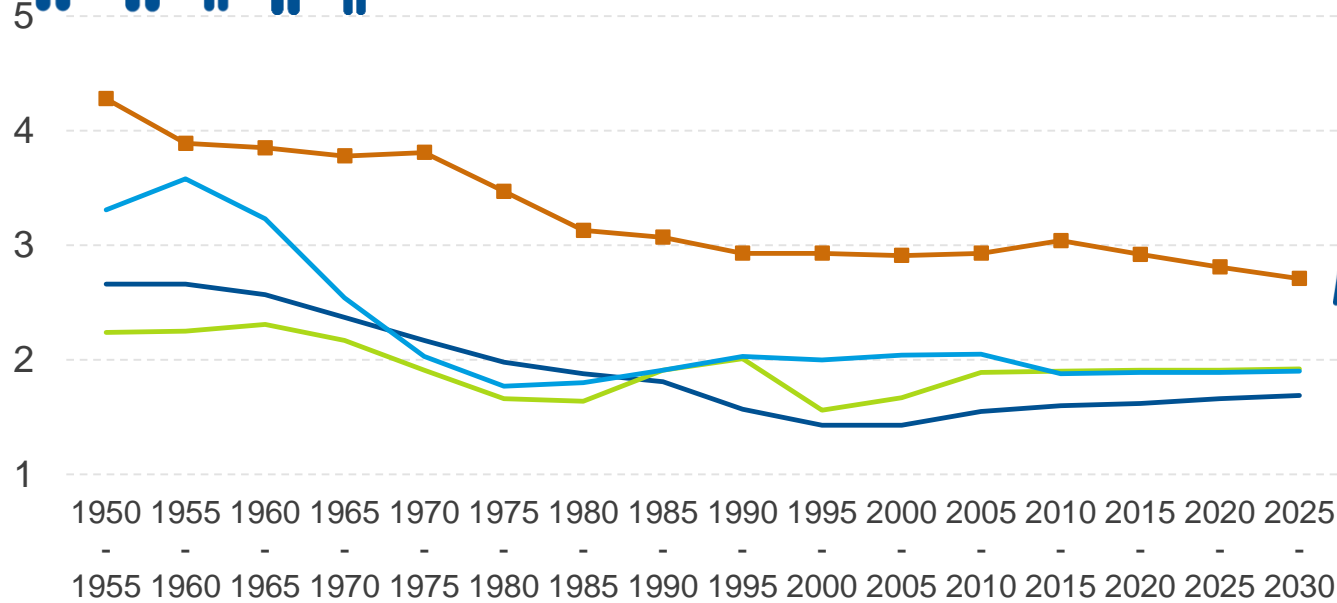
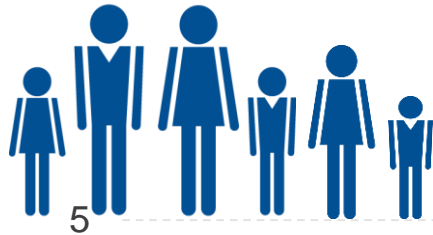
Life Expectancy at age 65



Source: United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision, <https://population.un.org/wpp/>

Total Fertility Rate

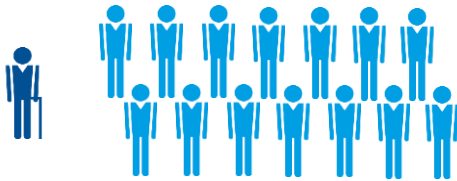
Children per woman



Source: United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision, <https://population.un.org/wpp/>

Dependency Ratio

Number of individuals aged 65 and over per 100 people of working age defined as those aged between 20 and 64



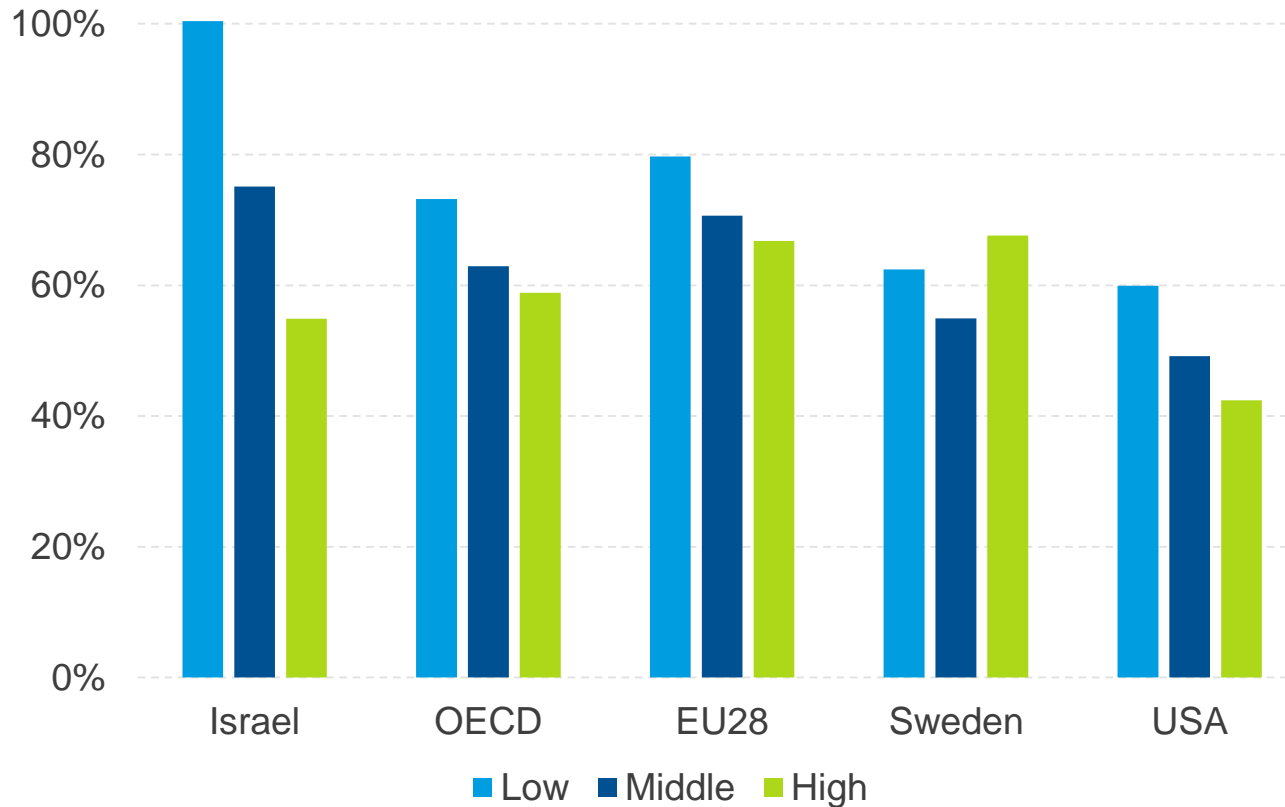
	1950	1960	1970	1980	1990	2000	2010	2015	2020	2030
Israel	7	9	13	17	18	19	19	21	24	26
Europe	14	15	19	22	21	24	26	29	32	41
Sweden	17	20	23	29	31	30	31	34	36	41
USA	14	17	19	21	22	21	22	25	29	37



Source: United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision.

Net Replacement Rate

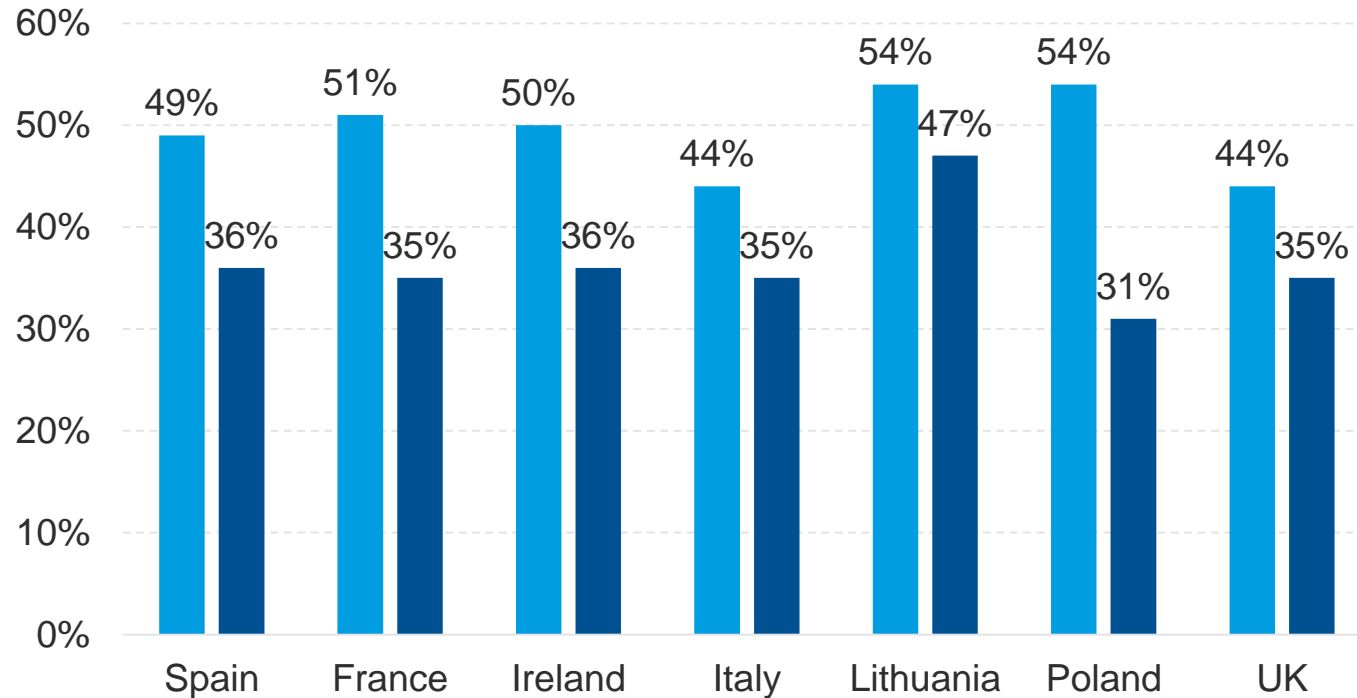
Mandatory pension schemes



Source: OECD (2017), "Net pension replacement rates: mandatory and voluntary schemes", in *Pensions at a Glance 2017: OECD and G20 Indicators*, OECD Publishing, Paris

So, what now?

Worry – Action Gap¹



- I am worried I won't have enough money when I retire
- I am taking steps now to ensure I have an adequate retirement income

Source: ¹ Consumer Attitudes Survey (Aviva MarNov 2015)

Longevity Protection

Aspects to consider

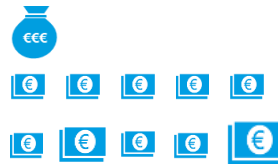
Sales channel

Individual or group?



Premium Payment

Lump sum or regular payment?
Fixed or variable?



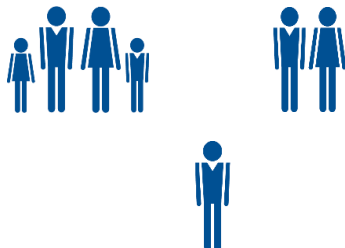
Financials

Fixed, variable or indexed?
Tax incentives?



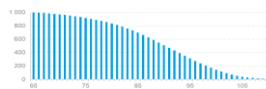
People covered

Single life or joint lives?



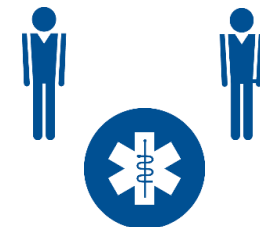
Commitment

Lump sum, fixed term or life long?
With or without guarantees?



Underwriting

Standard or enhanced annuity?



Case Study: UK

Pillar II

Life long immediate annuity

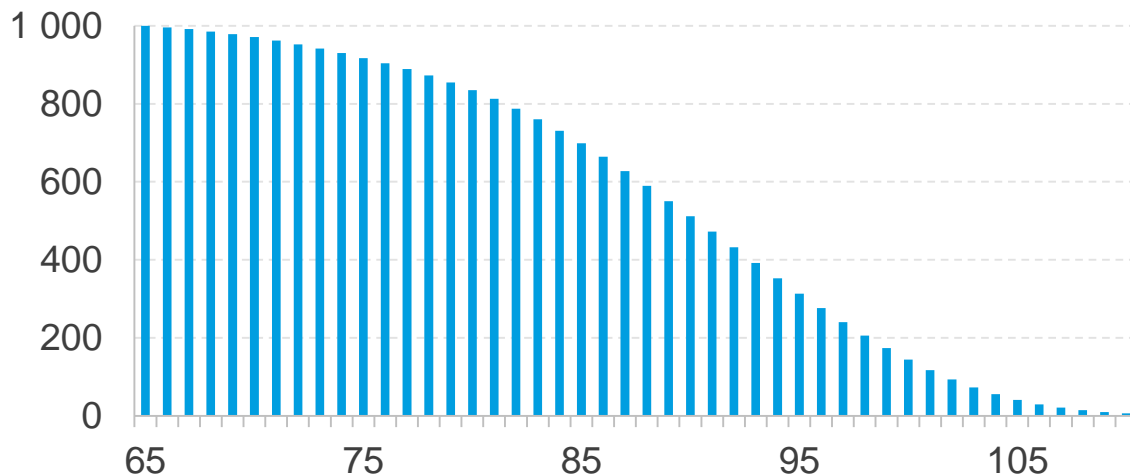
Retiree
annuitizes
his fund

Life Long Annuity starts immediately



65

Age



Fund size at age 65:

230,000 €

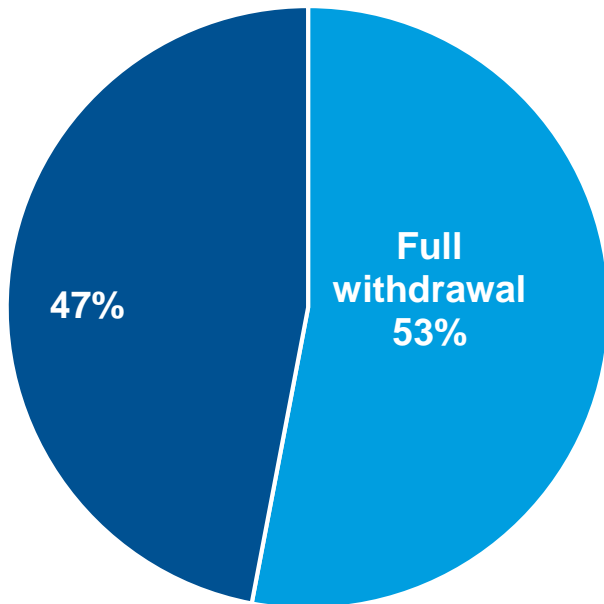
for a monthly annuity of
1,000 € from age 65 until
death

All calculations before margins, expenses and cost for reinsurance, risk free interest rate €, Swedish population mortality, male single life

Freedom and Choice in Pension Act - UK

What happened since 2015 until 2017?

Before the pension freedoms, over 90% of pots were used to buy annuities.

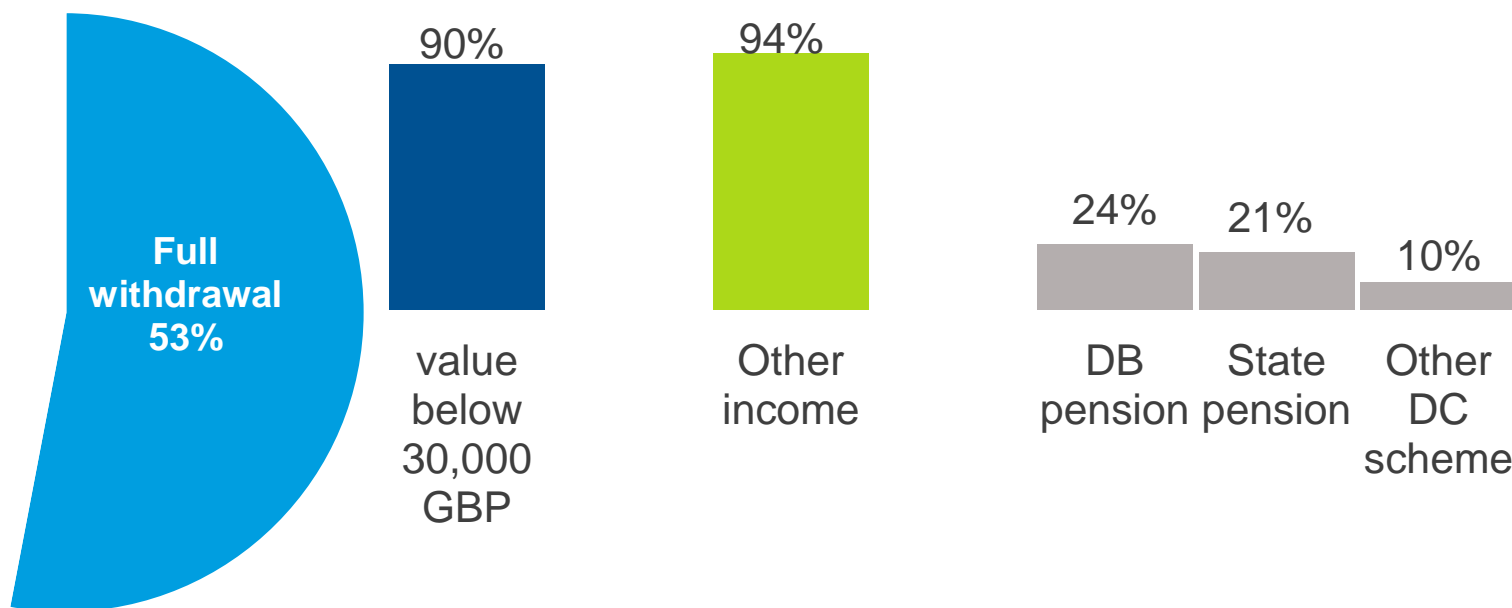


Source: Retirement outcomes review: interim report, July 2017, Financial Conduct Authority, UK

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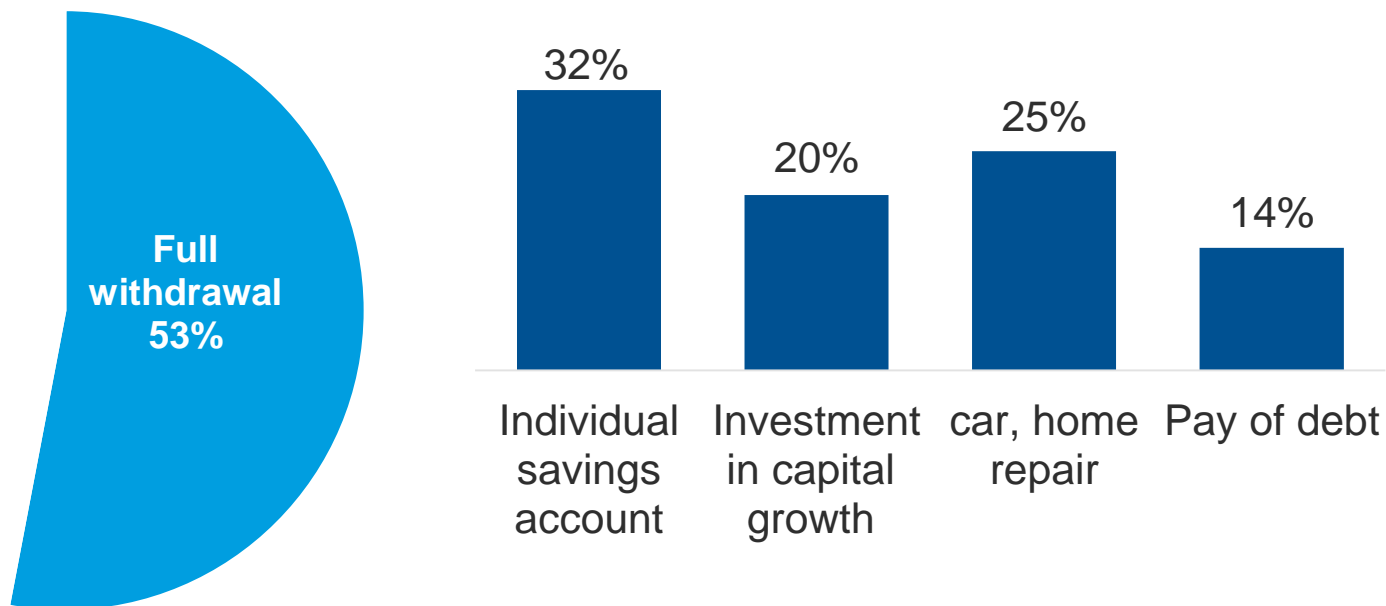


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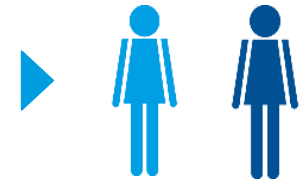
Source: Retirement outcomes review: interim report, July 2017, Financial Conduct Authority, UK

How long are we going to live?



2 in 3 pre-retiree men **underestimate** the life expectancy of the average 65-year-old man

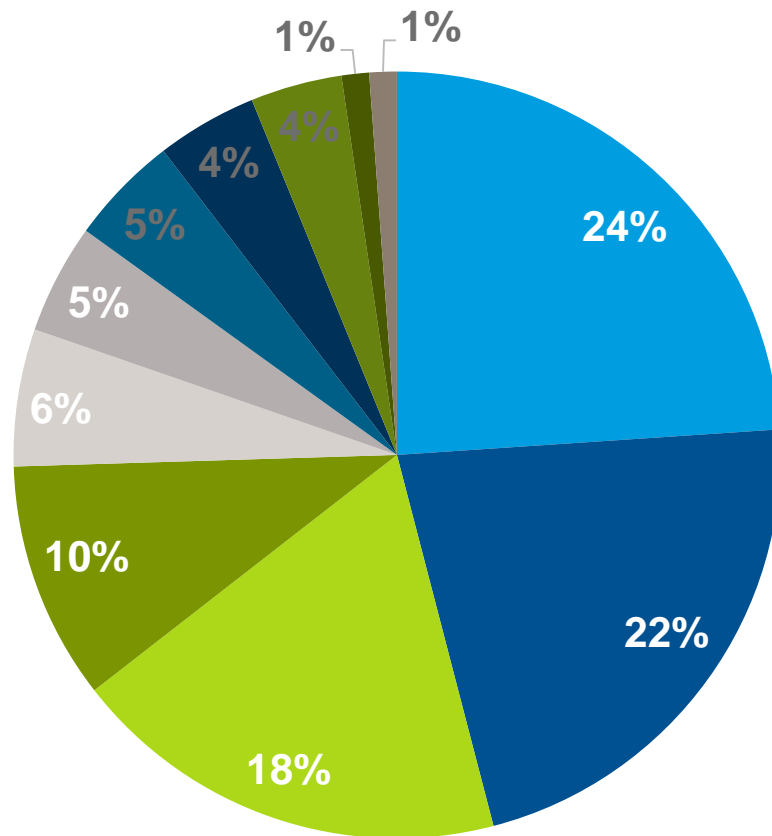
1 in 2 pre-retiree women **underestimate** the life expectancy of the average 65-year-old woman



Source: Stanford Center on Longevity, <http://longevity.stanford.edu/underestimating-years-in-retirement/>

What are your plans?

Flexibility in retirement



- Traveling
- Spending more time with friends and family
- Pursuing new hobbies
- Volunteer work
- Continue working in the same field
- Living abroad
- Studying
- Continue working, but in another field
- Starting a business
- None of the above
- Don't know

Source: Successful Retirement – Healthy Aging and Financial Security, The Aegon Retirement Readiness Survey 2017

Why do people abstain from buying annuities?

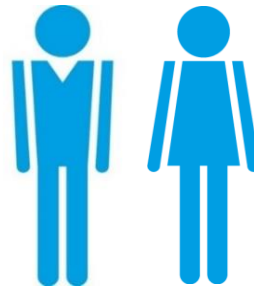
I will not live that long.

If I bought an annuity, I think I would get little value for my money.

If I die the money is lost.

This is all too complicated and I do not want to think about being old.

I would like to control & invest my money as I think best.



There are no incentives.

I would like to access my money whenever I want to.

I believe that I'll get enough pension. The state will take care of me.

Alternative insurance concepts?

Deferred annuity at retirement

Life long immediate annuity

Retiree annuitizes his fund

Life Long Annuity starts immediately



65

85

Age



Retiree pays single premium.

Retiree manages his own funds.
Draw down according to needs!

Life Long Annuity starts later in life.
Back up solution for old age!

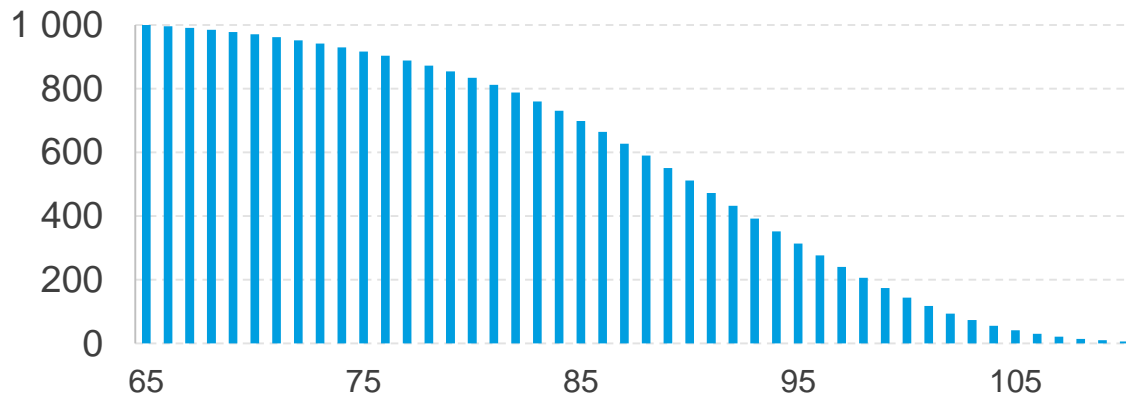
Deferred annuity at retirement

Cash flow comparison

Deferred annuity at retirement requires substantially lower investment

Immediate annuity

in €



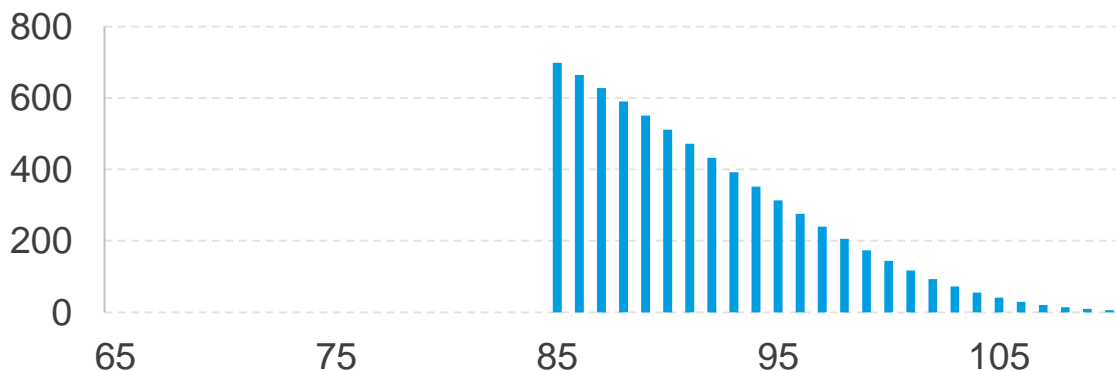
Single premium at age 65:

230,000 €

for a monthly annuity of 1,000 € from age 65 until death

Deferred annuity at retirement

in €



Single premium at age 65:

39,000 €

for a monthly annuity of 1,000 € from age 85 until death

All calculations before margins, expenses and cost for reinsurance, risk free interest rate €, Swedish population mortality, male single life

Case Study: U.S.

Long-Term Services and Support (LTSS) - Fact Sheet

60% of adults needing help with everyday activities are 65 or older. (2014)



More than 50% of older people with disabilities remaining in the community relied exclusively on unpaid help. (2004)



20% of caregivers with the most intense level of responsibility report that they are reducing work hours, taking a less demanding job, or giving up work entirely.

The total economic value of family caregiving was **\$470 billion** - more than the total formal LTSS spending of \$339 billion. (2013)

Average annual cost of a private room in a nursing home was about **\$92,000** and **\$82,000** for a shared room. (2016)

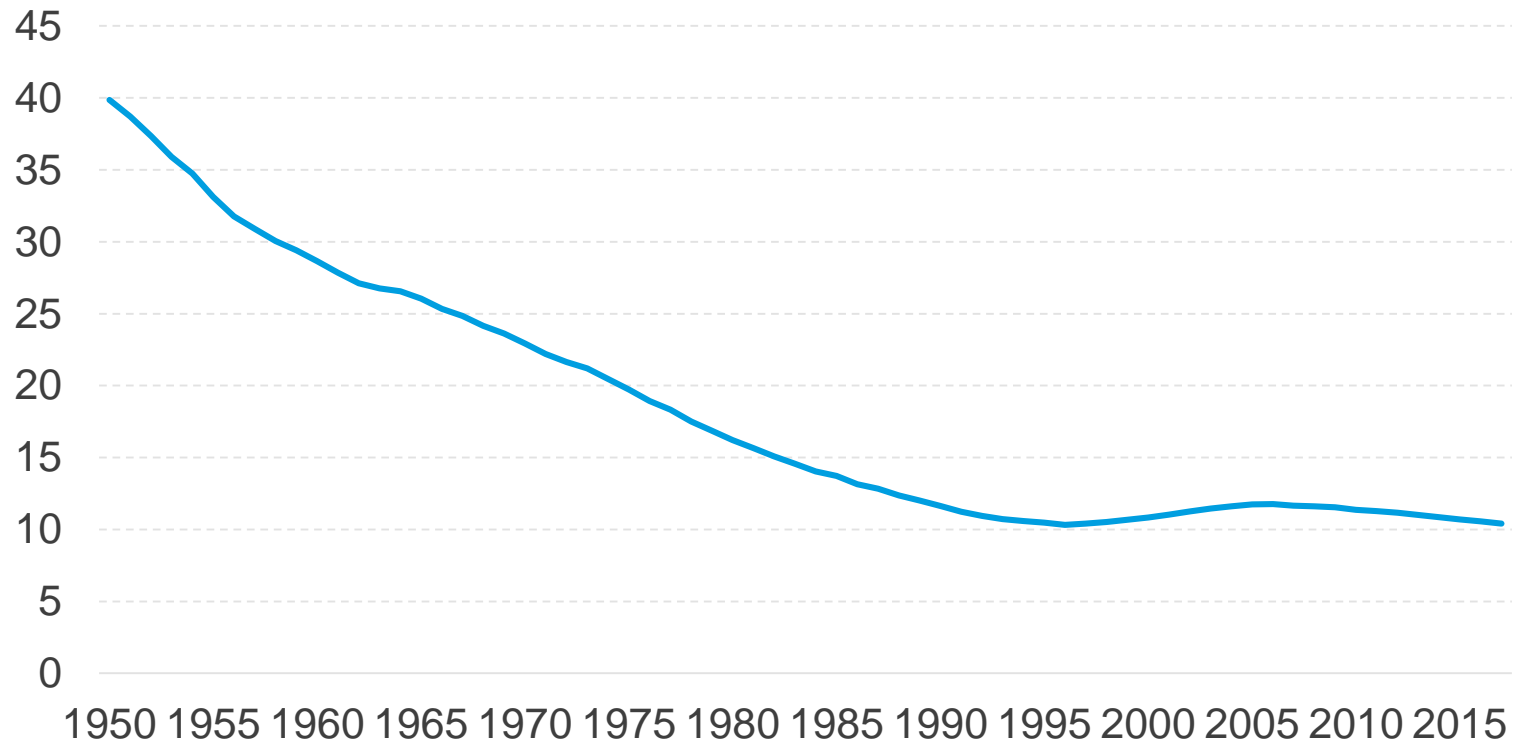


Source: Fact Sheet - Long-Term Support and Services, AARP Public Policy Institute

Case Study: U.S.

Intergenerational support coefficient

Number of individuals aged 85 and over per 100 people of age between 50 and 65



Source: Human Mortality Database (HMD), <https://www.mortality.org/>

Alternative insurance concepts?

Immediate Needs Annuity

Challenge

Care dependence creates **unpredictable liabilities**

- ▶ Individual variance in life expectancies can be very high



- ▶ Variance risk is with patient and family



Solution

Individual **“Immediate Needs Annuity”**

- ▶ **Covers gap between** payments to nursing home and regular income
- ▶ Issued at entry into nursing home:
 - Simplified medical underwriting
 - Lump sum payment to insurer



Benefits

- ▶ Insurance takes the “variance risk” from patient and family
- ▶ Payment security for nursing home



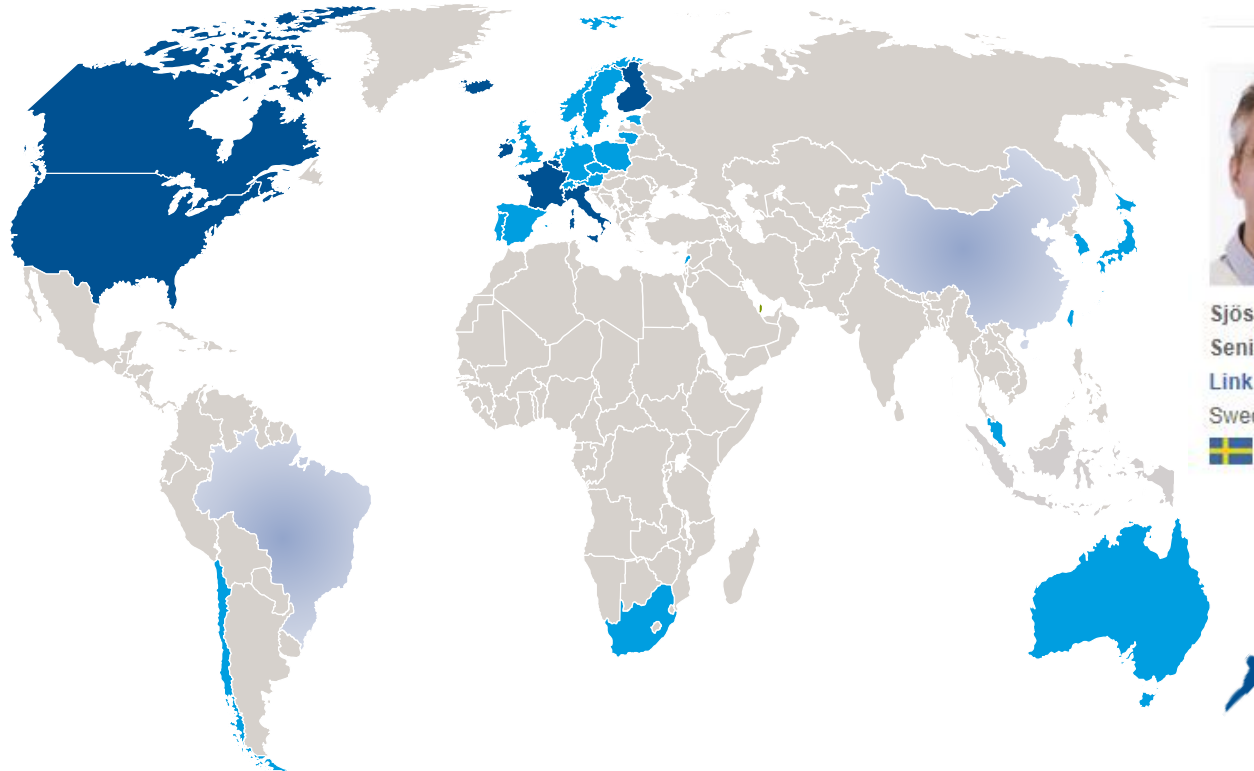
- ▶ Collaborative network of researchers and practitioners in over 35 countries
 - committed to improving care for persons who are disabled
 - striving to promote evidence-informed clinical practice and policy decision making through the **collection and interpretation of high-quality data** about the characteristics and outcomes of persons served across a variety of health and social services settings
 - via standardized clinical assessment protocols

- ▶ InterRAI related databases include data on millions of individuals in need of care collected over many years covering 500+ parameters

The InterRAI Network




U.S.

InterRAI assessment mandatory
Done by the Centers for Medicare and Medicaid Services

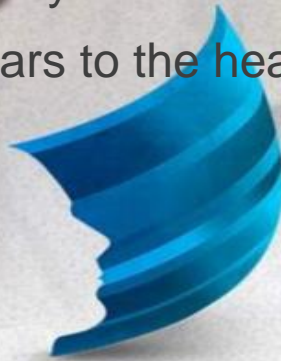


Sjöstrand, Fredrik, MD, PhD
Senior Researcher
[Link to biography](#)
Sweden



-  Federal or provincial governments have mandated interRAI to be used
-  Use of InterRai within certain regions and for research studies
-  Countries where governments have decided to go for bigger pilots

- ▶ **Predictive** engine to process data generated from millions of individuals
- ▶ by **machine-learning algorithms**
- ▶ to create **profiles** and facilitate **decision-making** for long-term care
- ▶ Goal:
 - **improved care** for the elderly
 - **savings of billions** of dollars to the healthcare industry worldwide.



PROFILITY
THE POWER TO PREDICT

Hannover Re, InterRAI and Profility

hannover re[®]

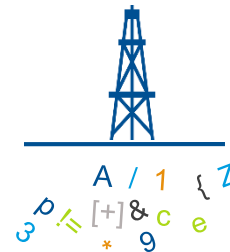
 **interRAI**[™]

 PROFILITY

- ▶ A collaboration to understand life expectancy for Long Term Care patients
- ▶ Cohort: 2m patients, maximum follow-up period of 4 years

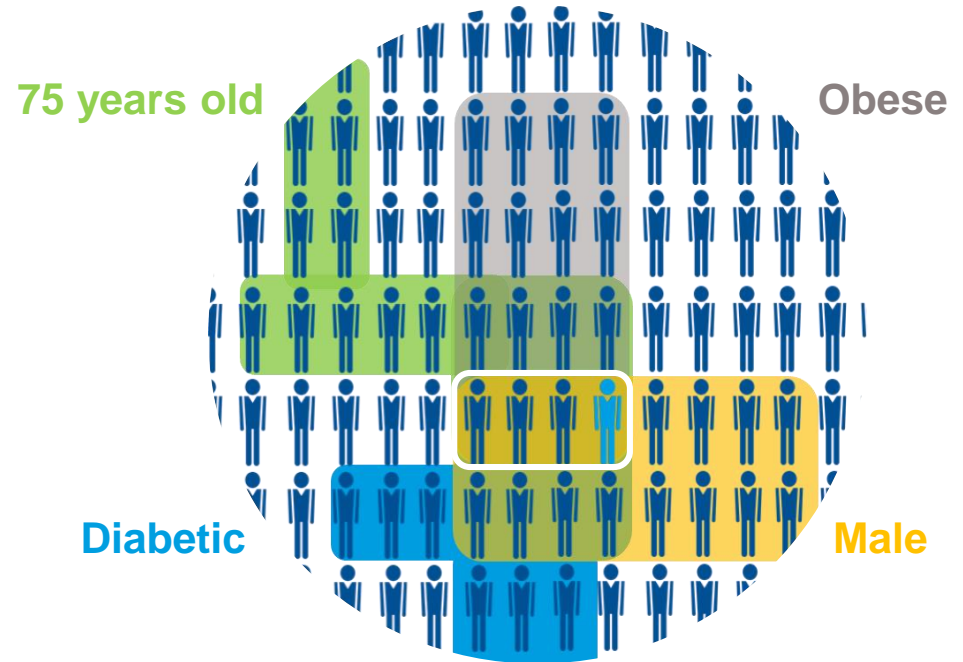
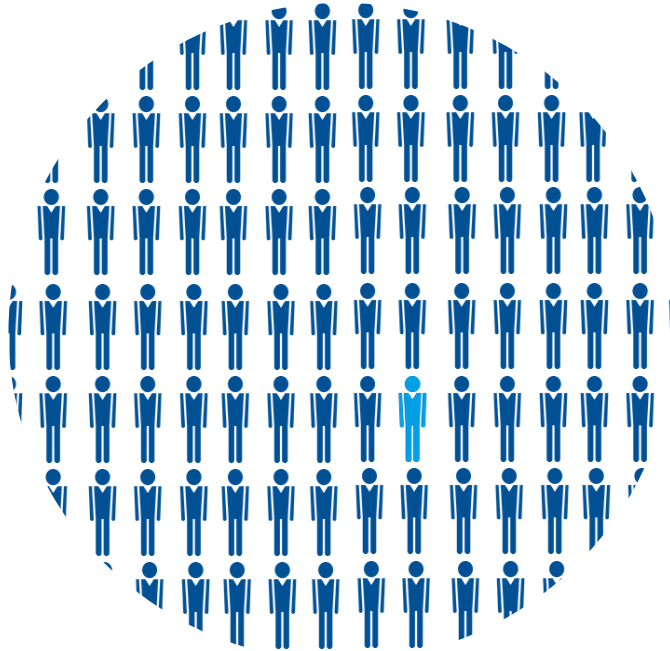
350 clinical characteristics per patient x 4 assessments per year x 4 years follow-up x 2 000 000 patients = 11,2 billions of data points

- ▶ Two studies
 1. Traditional Statistical Approach
 2. Data mining approach using Profility's predictive engine



Profility

Profility's predictive engine



Male, 75 years old,
diabetic and obese

Why do insurers abstain from offering annuities?



Insurer

- ▶ Longevity risk: Missing expertise, model and parameter risk
- ▶ Reputational risk if obligations are not fulfilled
- ▶ SII - High capital requirements for longevity risk & market risk
- ▶ Asset management: Long duration, high roll over risk, financial guarantees, inflation, model and parameter risk
- ▶ Marketing & Sales

Why do insurers abstain from offering annuities?

Where can reinsurance support?



Insurer

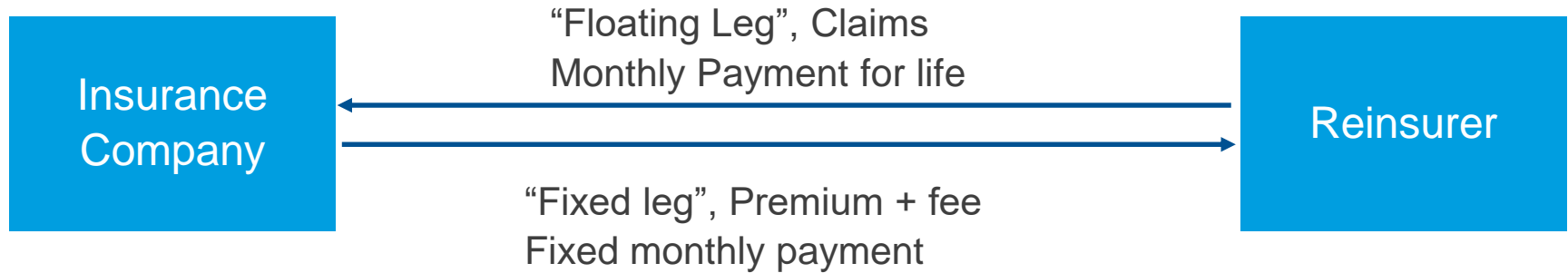
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- ▶ Asset management: Long duration, high roll over risk, financial guarantees, inflation, model and parameter risk
- ▶ Marketing & Sales

Reinsurer

- ▶ Expertise
- ▶ Medical uw
- ▶ Longevity risk reinsurance up to natural expiry
- ▶ Capital requirements lower due to diversification

Reinsuring Longevity

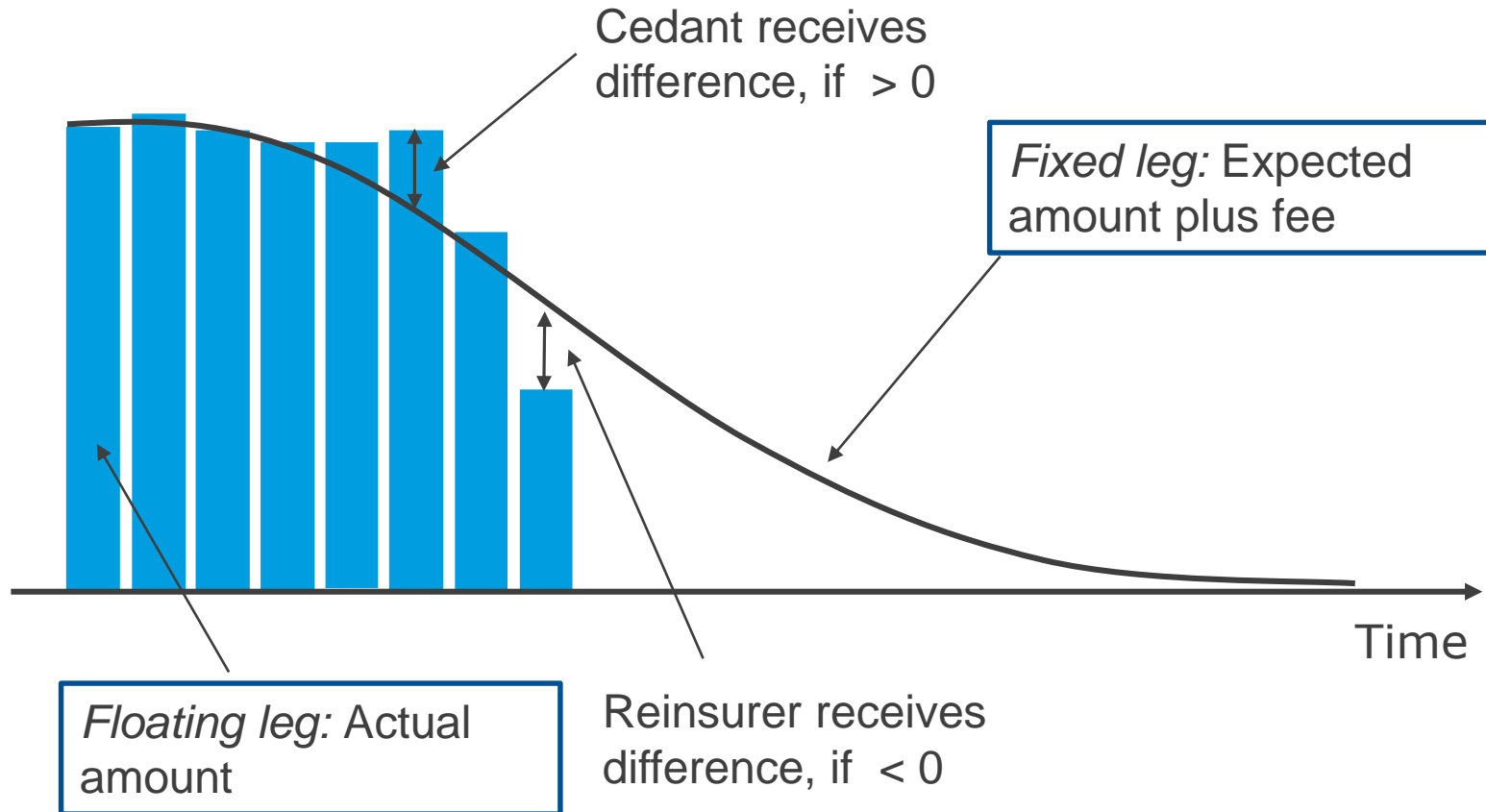
Regular Premium Annuity Treaty (RPAT)



- ▶ Proportional reinsurance agreement – typically a quota share
- ▶ Reinsurer pays actual annuity benefits for reassured business
- ▶ Reinsurer receives regular reinsurance premium equal to expected annuity payments plus a fee
- ▶ Reinsurance premium fixed at inception based on best estimate mortality and mortality improvements
- ▶ Net settlement of cash flows

Regular Premium Annuity Treaty (RPAT)

Exchanging expected and actual cash flows



Fixed leg includes a risk margin

Take-aways

Marketing of insurance concept is important –
Overcoming the hurdle



Deferred annuities at retirement
- Investment materially lower & more flexibility



Deferred annuities at retirement & Immediate needs annuities
- Potential to provide financial security for old age



Partnership with Reinsurance -
Gaining access to expertise, increase effectiveness



Thank you for your attention!

Any question?



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