



Funpresp Seminar

Brian O'Malley, Aegon Blue Square Re

Brasilia, 23 April 2019

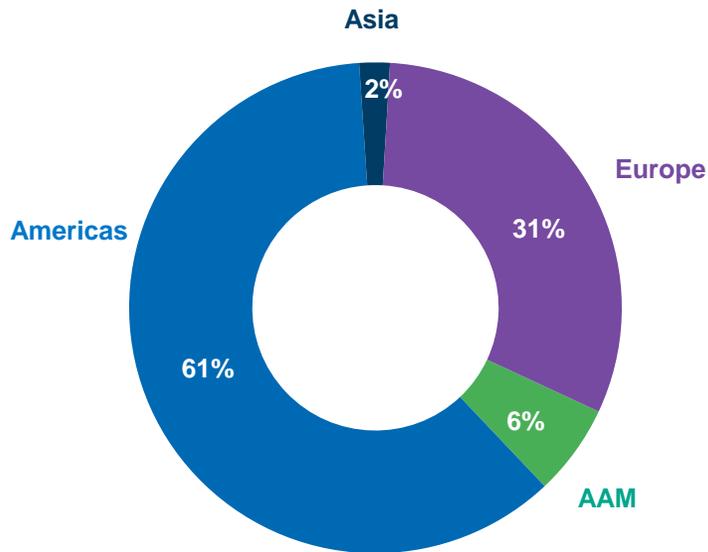
Helping people achieve a lifetime of financial security



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Reinsurance can help? | | |

Aegon at a glance



Earnings

Underlying earnings before tax of **€ 2.1 billion** (Full year 2017)



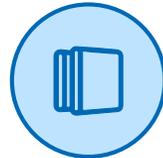
Focus

Life insurance, pensions & asset management for approximately **29 million customers**



Sales

Total sales of **€ 16.2 billion¹⁾** (Full year 2017)



History

Our roots date back to the first half of the **19th century**



Employees

Over **28,000** employees (December 31, 2017)



Investments

Revenue-generating investments **€ 817 billion** (December 31, 2017)



Paid out

in claims and benefits **€ 48.1 billion** (2017)

¹⁾ Sales represents new life sales + accident & health premiums + general insurance premiums + 1/10 of gross deposits

A brief history of Aegon Blue Square Re



Dutch share company (“N.V.”) wholly owned by AEGON N.V.
Licensed as life and non-life reinsurer based in The Netherlands on
February 22nd, 2011



First deal January 1st, 2012

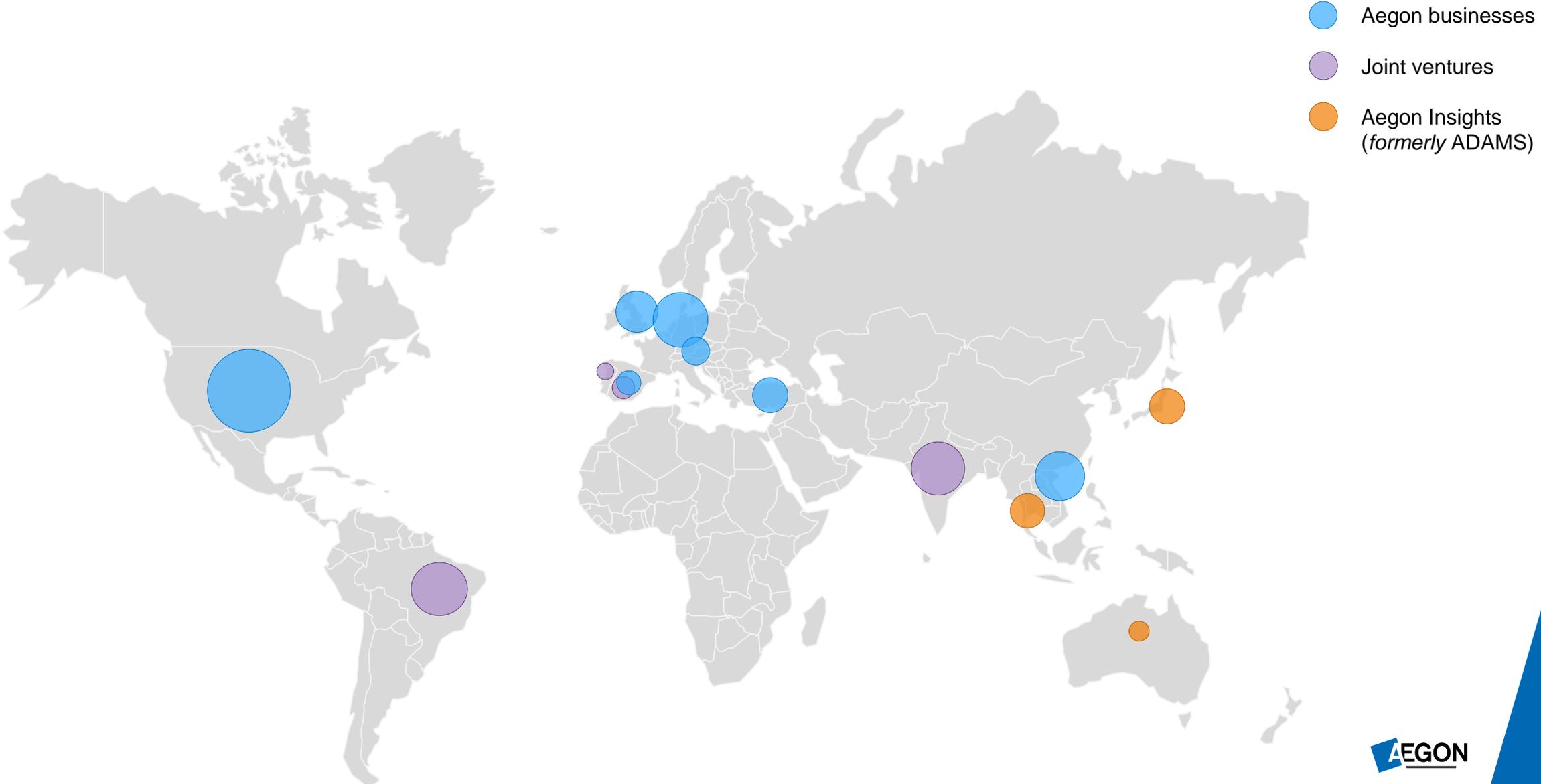


Though license is not restrictive, Blue Square accepts only AEGON sourced
business, so not operating as third party reinsurer per se though
counterparties may be third parties (e.g., Aegon Insights)



S&P rating AA-

Aegon Blue Square Re is Present in 13 countries



Aegon Blue Square Re in Brazil

MONGERAL
AEGON





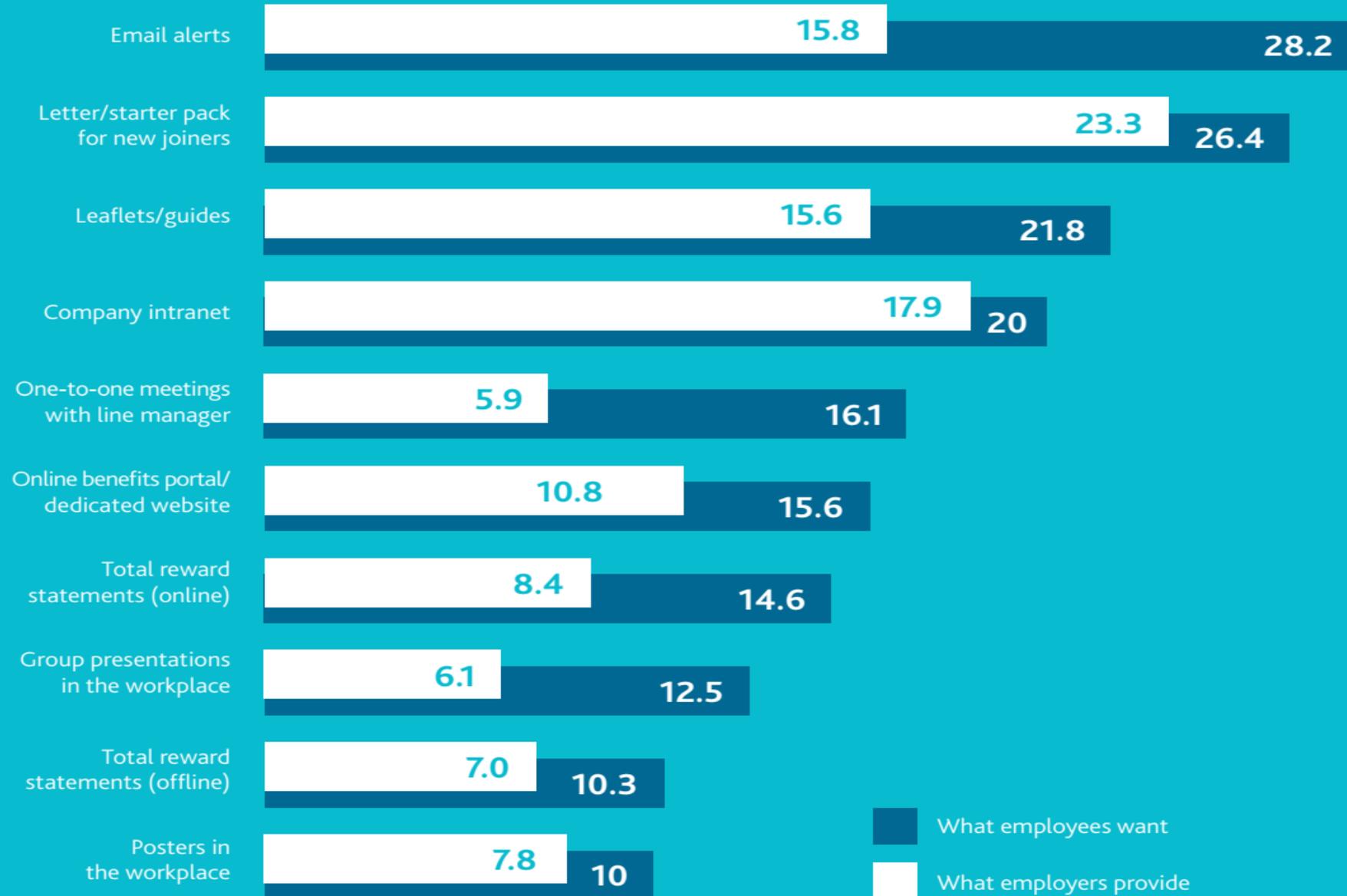
Challenges in Pension Provision Today

Challenges in Pension Provision Today

Personal & Emotional type Challenges

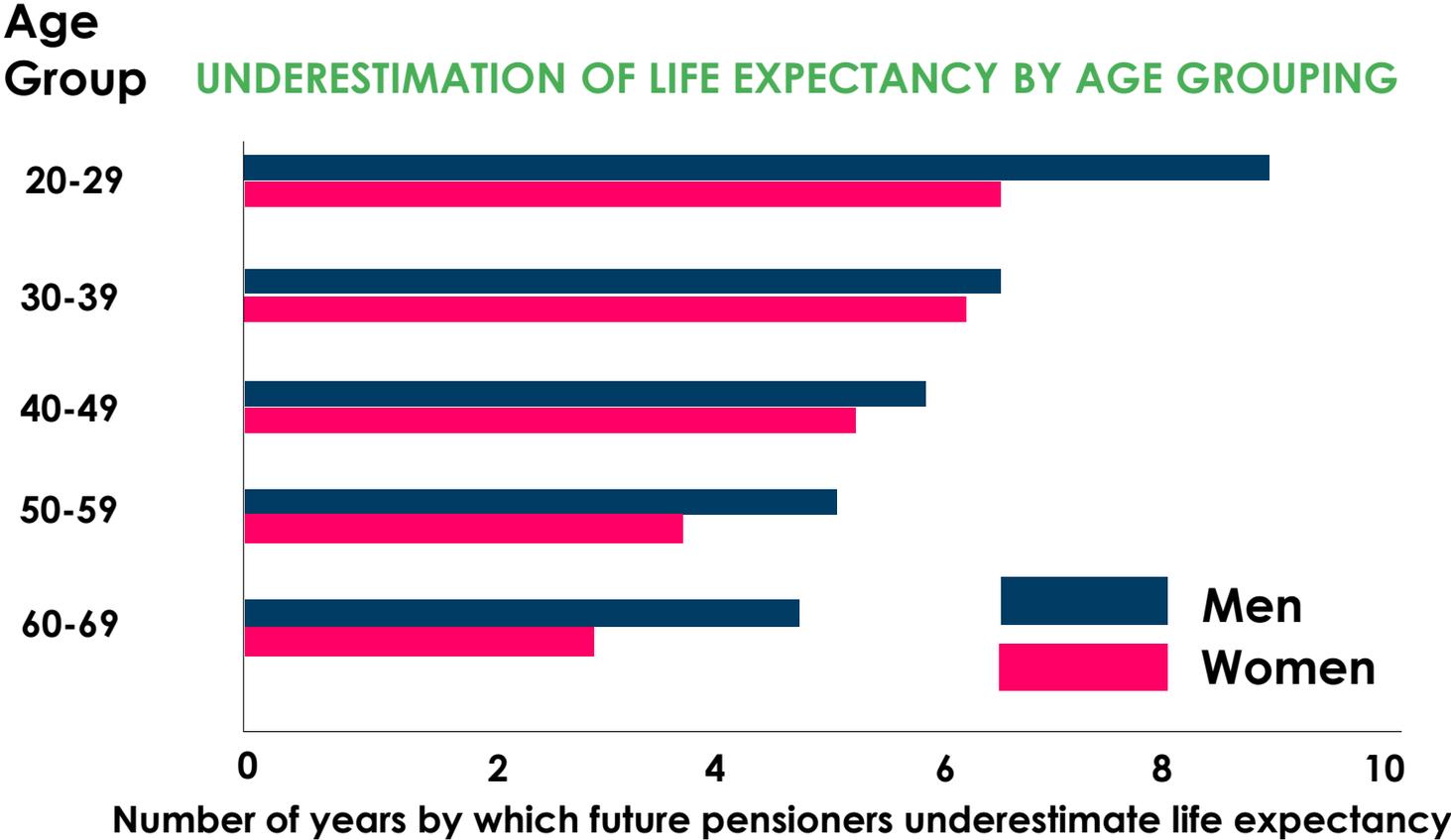
1. **People starting to save too late. For others, Pensions feel too distant away and some feel that the jargon used is too complicated – and as a result those people choose to continue to ignore the need.**
2. **There is now a mix of People looking to retire too early (both a drawdown and cease contribution respect) ; balanced by the development of the “gig economy” and a move to No retirement age for others.**
3. **People who save are just not saving enough – comprehension of the level of funding that is needed?**
4. **Moral hazard – for some, there is still too much dependency on the State provision.**
5. **Most People would like to live for quite a long time, and some have no idea how to prepare for it.**
6. Education Levels / Individual Risk Tolerances / Intangible nature of pensions
7. Forced Annuitization versus Pensions Freedom versus Remaining Desire for Annuity Type Solutions
8. Striking a balance between too many investment choices and too little for all stakeholders / The “Default” fund
9. Portability of Options and Centralised Admin – personal Dashboard – the Admin challenges to keep up with the pace of change. (Auto Enrolment, GDPR, cyber security)
10. Tax Efficiency of pension arrangements / favoured tax status is coming under threat despite the tax-deferral nature of of pension incentives

The mismatch between how employers communicate and how employees want to be communicated to (%)



The Gap in Communication needs for Pension Members

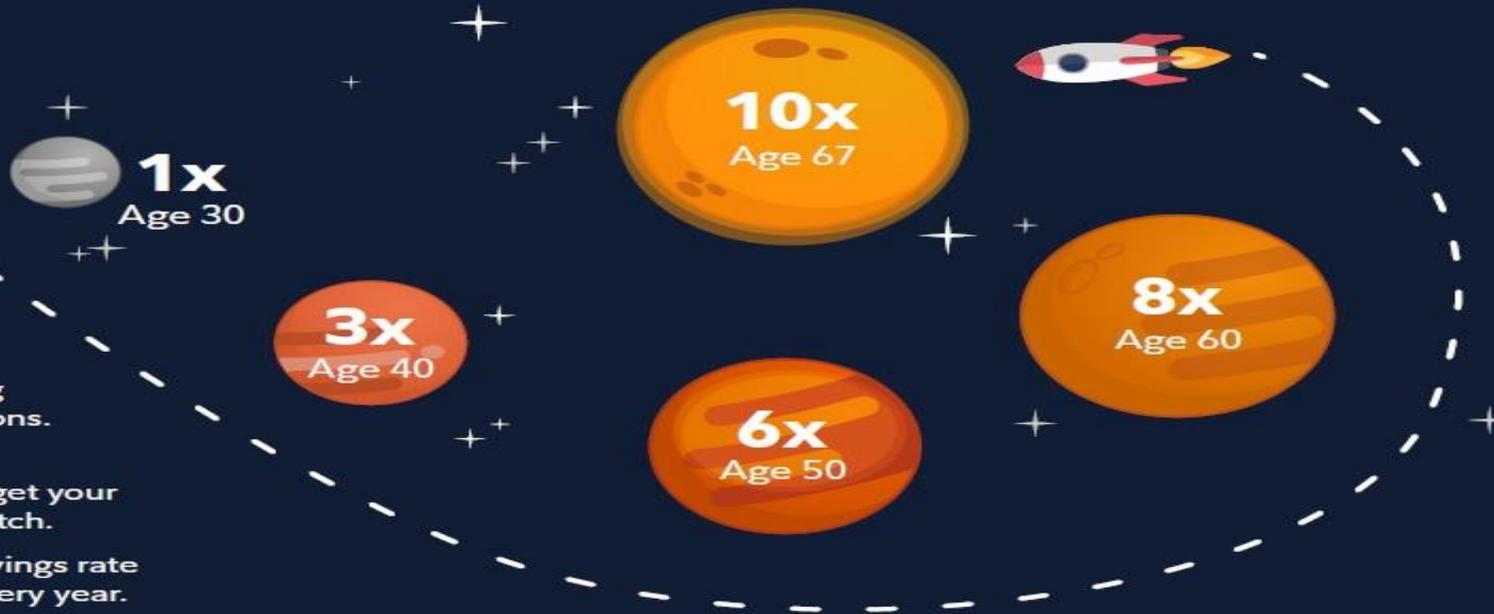
Future Pensioners underestimate how long they will live



* O'Brien, Fenn and Diacon paper on "How long do people expect to live"

Blast off toward retirement

Knowing how much to save for retirement can help you get on a trajectory to meet your long-term goals. To be financially ready to retire, aim to have 10 times (10x) your final salary saved by age 67. Along the way, try to have the following multiples of your salary saved at each of your milestone birthdays:



Fidelity suggests saving at least 15% of your income for retirement, including employer contributions. If you're off course:

- + Save enough to get your full company match.
- + Increase your savings rate by at least 1% every year.

Continued Education of Future Pensions needs to be a Key Focus

Fidelity has developed a series of salary multipliers in order to provide participants with one measure of how their current retirement savings might be compared to potential income needs in retirement. The salary multiplier suggested is based solely on your current age. In developing the series of salary multipliers corresponding to age, Fidelity assumed age-based asset allocations consistent with the equity glide path of a typical target date retirement fund, a 15% savings rate, a 1.5% constant real wage growth, a retirement age of 67 and a planning age through 93. The replacement annual income target is defined as 45% of pre-retirement annual income and assumes no pension income. This target is based on Consumer Expenditure Survey 2011 (BLS), Statistics of Income 2011 Tax Stat, IRS 2014 tax brackets and Social Security Benefit Calculators. Fidelity developed the salary multipliers through multiple market simulations based on historical market data, assuming poor market conditions to support a 90% confidence level of success. These simulations take into account the volatility that a typical target date asset allocation might experience under different market conditions. Volatility of the stocks, bonds and short-term asset classes is based on the historical annual data from 1926 through the most recent year-end data available from Ibbotson Associates, Inc. Stocks (domestic and foreign) are represented by Ibbotson Associates SBBI S&P 500 Total Return Index, bonds are represented by Ibbotson Associates SBBI U.S. Intermediate Term Government Bonds Total Return Index, and short term are represented by Ibbotson Associates SBBI 30-day U.S. Treasury Bills Total Return Index, respectively. It is not possible to invest directly in an index. All indices include reinvestment of dividends and interest income. All calculations are purely hypothetical and a suggested salary multiplier is not a guarantee of future results; it does not reflect the return of any particular investment or take into consideration the composition of a participant's particular account. The salary multiplier is intended only to be one source of information that may help you assess your retirement income needs. Remember, past performance is no guarantee of future results. Performance returns for actual investments will generally be reduced by fees or expenses not reflected in these hypothetical calculations. Returns also will generally be reduced by taxes.

This information is intended to be educational and is not tailored to the investment needs of any specific investor.

All investing involves risk, including the risk of loss.

Fidelity Brokerage Services LLC, Member NYSE, SIPC, 900 Salem Street, Smithfield, RI 02917

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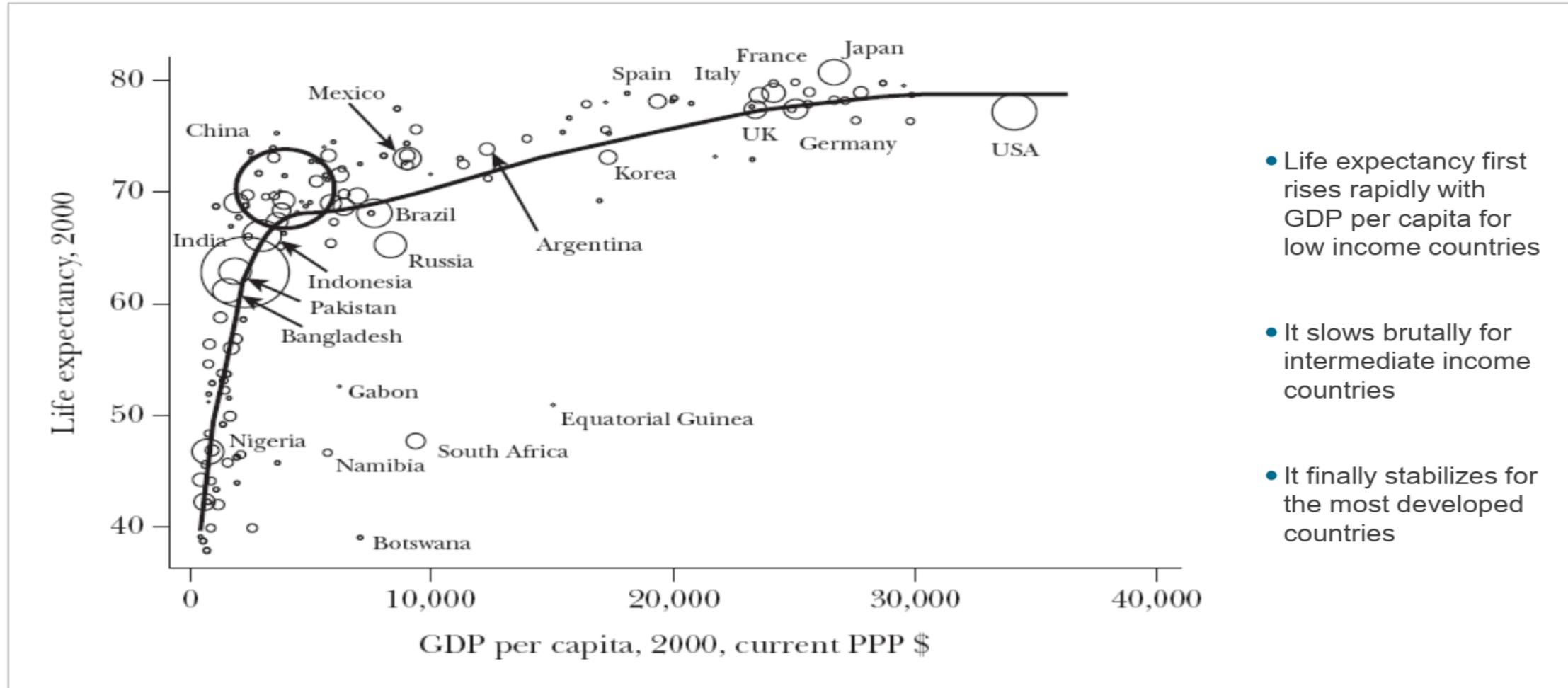
Challenges in Pension Provision Today (continued)

Macro level type Challenges

1. Life Expectancy / Longevity – this topic has started to come more into relative focus now even for DC plans
2. Investment Returns (Volatility of returns) / Inflation rates / Drive towards ESG type investments / The success or not of life-styling options (?)
3. Birth Rates / Replacement Ratios (PAYG systems)
4. Shortness of Political Cycle versus Longer Term Generational Needs & the need for inter-generational fairness
5. Welfare Reform / revising DB scheme rules / (“broken promises”) - what is truly Affordable and managing the volatility of that cost. Noting that we are at **Record High Levels** of contributions being made. The need to balance the interests of all stakeholders.
6. Evolution of regulatory regimes and the associated cost of capital / Advent of Gender neutral pricing
7. Auto-Enrolment breathing life into DC style arrangements / Regulatory Maximum Charges
8. Relative more attention now being paid to the de-cumulation phase of pension provision / Moves to No Retirement Age
9. Mistakes of the industry have undermined some trust & the inconsistency in messaging has not helped

GDP per capita and life expectancy

■ **The Preston curve** : a “Γ” curve that relates the average life expectancy to the level of the GDP per capita



- Life expectancy first rises rapidly with GDP per capita for low income countries
- It slows brutally for intermediate income countries
- It finally stabilizes for the most developed countries

Longevity risk is composed of 3 components; trend is the most material

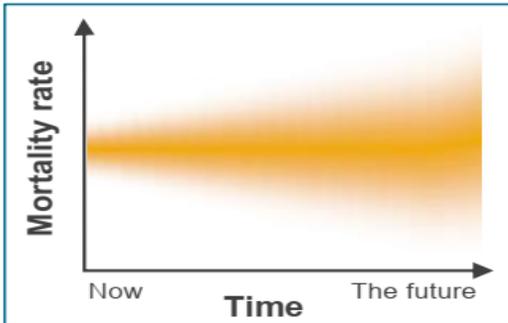
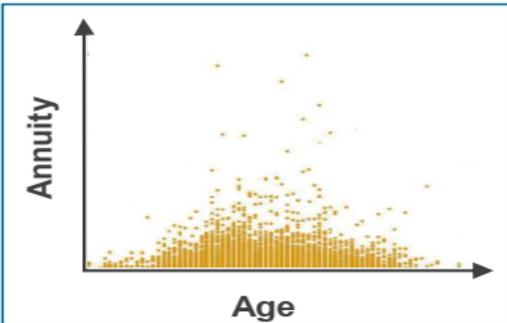
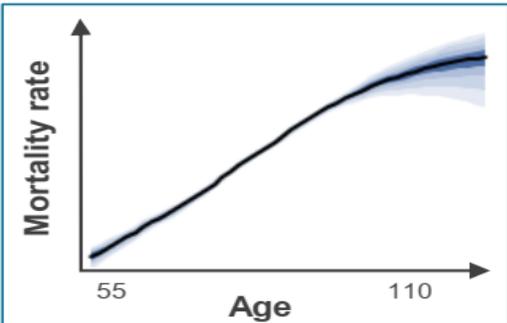
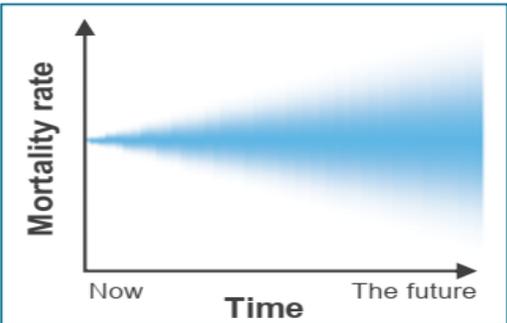
Trend risk + **Level risk** + **Volatility risk** = **Longevity risk**

Risk that mortality rates improve faster than expected

Risk of an inaccurate assessment of current mortality rates

Risk of volatile mortality rates due to insufficient mutualisation, heterogeneous portfolio

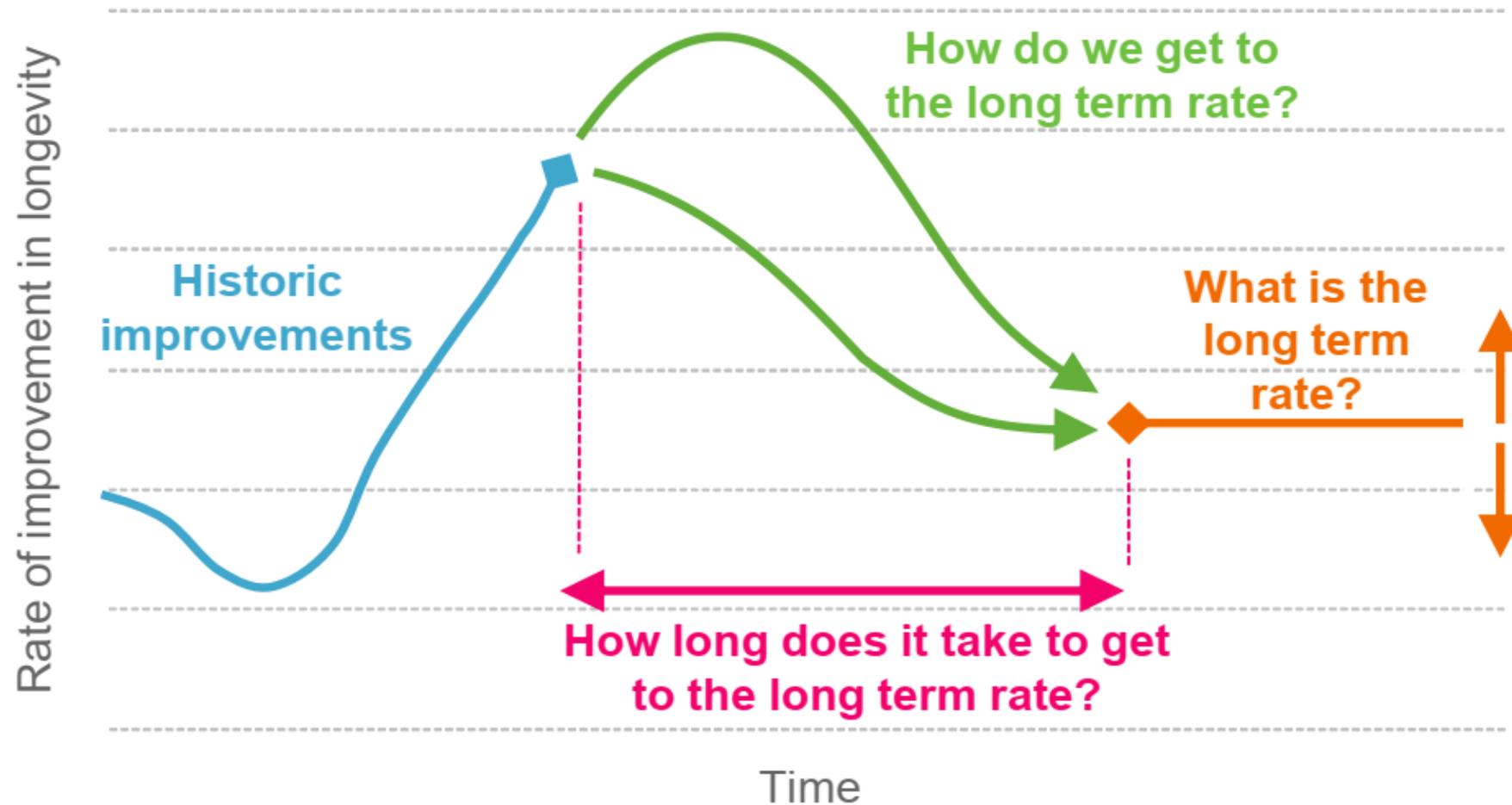
Combination of all components



It is the main risk component, the most material

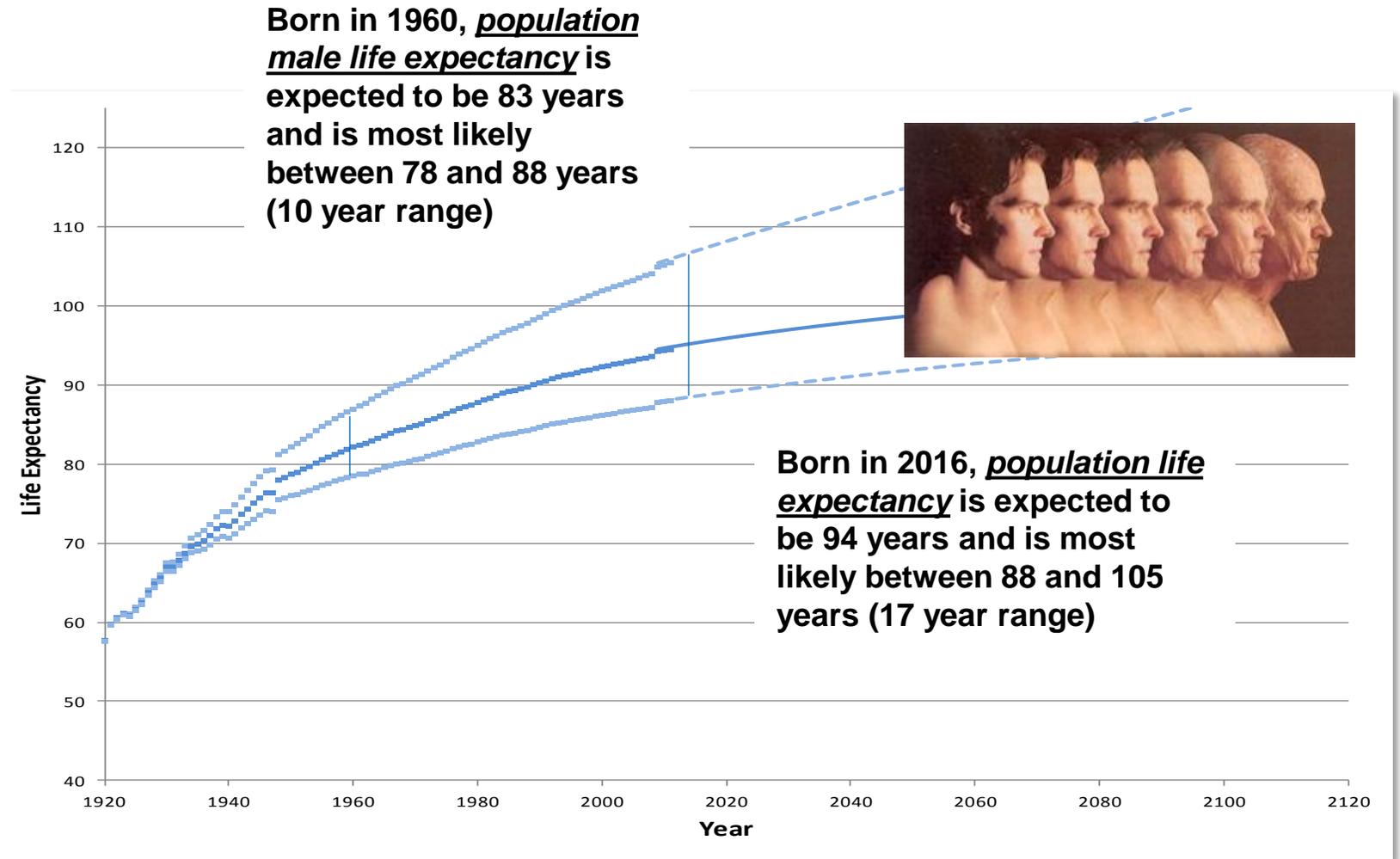
The Challenge in Setting Longevity Assumptions

Calibrating a model can be split into four parts, as summarised in the chart below:



Dutch Life Expectancy – A History

- Dutch life expectancy is currently increasing at 1-3 years per decade depending on cohort and geography
- This is factored into current assumptions to various degrees depending on geography
- Life expectancy is not a single number – it depends; it may accelerate or decelerate



Dutch Life Expectancy (Continued)

Table 1: Life expectancy and cost of retirement, based on a stochastic model calibrated for Dutch statistics

<i>Year of Birth</i>	<i>Year turning 65</i>	<i>Life expectancy @65</i>	<i>Cost of retirement. Price for €1 annually, until death</i>	<i>Income stream for €100K</i>
1915	1980	13.4	8.9	€11 291
1945	2010	19.4	11.5	€8714
1975	2040	24.7	13.5	€7381
2005	2070	27.6	14.5	€6906

What are your biggest current DB challenges?



The Long Term Goals for all Parties needs to stay in Focus



How Insurance / Reinsurance Solutions can help?

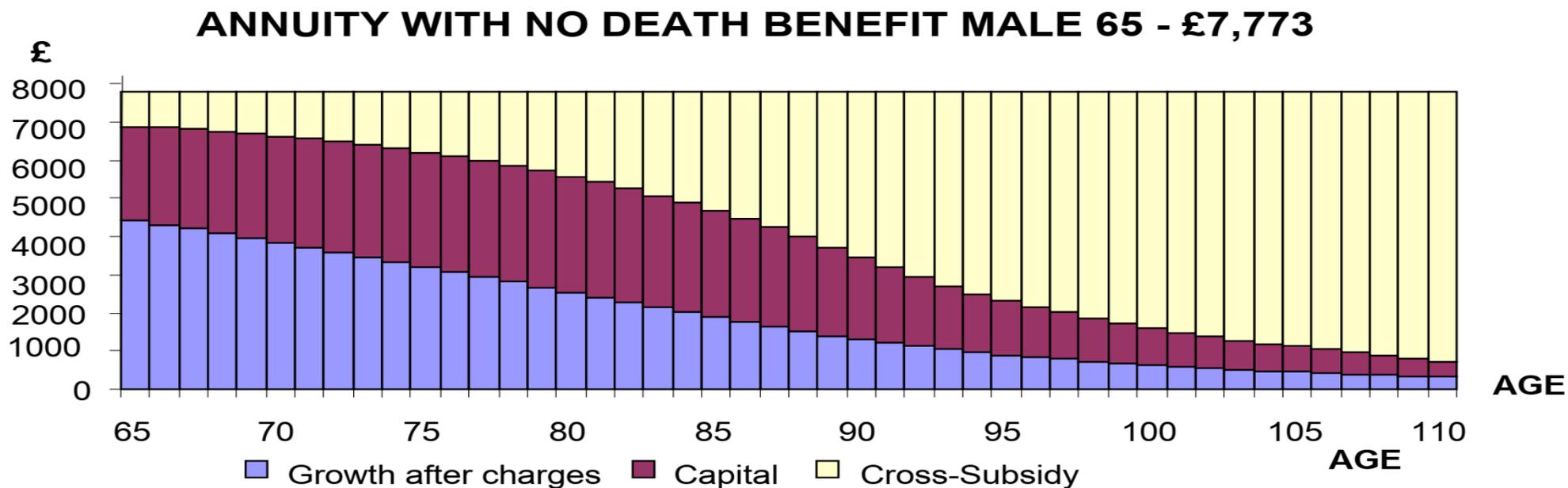
Insurance Industry & Pension Provision

1. Thought Leadership Role to Government / Regulator / Academia / Private Sector
2. Provider of DC admin platforms / efficient collective investment
3. Insurer of Longevity / Investment Risks and Rider Benefits
4. Insurer of Impaired Annuities in some markets
5. Future Development of even more Personalised Annuities (?)

Cross Subsidy in Traditional Annuities

The lifetime income guarantee provided by an annuity is funded by investment growth, the annuitant's own capital and the capital released by those dying early ...

Expected composition of each annuity payment for a male aged 65 purchasing an annuity for £100,000 providing an income of £7,773 payable at the end of each year to all annuitants still alive.



Impaired Annuities / Personalised Annuities

- Pension products are near the last item in the Life & Pensions product cycle to be **Personalised**
- Beyond Impaired Annuities (or Enhanced Annuities, UK market 1995) - not much else has taken place by way of innovation to date
- Which this development in itself of Impaired Annuities also had a knock-on subsequent impact of on the standard annuity market (with Impaired Annuities now making up 20% approx. of the UK annuity market)



Personalised Annuities

- Can a market be developed for Personalised Annuities?
 - The Pooling of Longevity Risk versus typically the Pooling of Insurance Risks has traditionally proved a “hard sell”.
 - Personalising would involve less guarantees / a reset at set interval(s).
 - Personalizing may also play a part in help shifting burden from employers/governments to individuals in the area of pension provision.



Reinsurance Industry & Pension Provision

1. Longevity Swaps - may be index-linked / basis risk a challenge (derivative used?). Full or partial covers. Attachment Points / Stop Loss. Reset Dates. (Cancellation / Renewal options). Include deferred pensioners perhaps.
2. Pension Buy-in / Buy-out
3. Appetite and price will depend on which risks need to be transferred - longevity, investment, inflation, admin risks
4. New sources of capital has joined this market recently - and demand level in early 2019 is reported as “unprecedented”
5. For insurance companies, the level of capital relief can be quite significant post reinsurance

Main Types of Reinsurer Backed Solutions

Longevity Swap:

- Client agrees to pay regular premiums to Insurer or Reinsurer
- Premiums comprise of an agreed “Fixed Leg” plus Fee
- (Re)insurer then pays the actual future pensions (“Floating Leg”)
- Longevity risk is transferred while client retains asset ownership, with control and flexibility around investment strategy.
- There may be multiple counterparties to a swap
- Terms are set out in Insurance/Reinsurance Agreements
- These set out the key obligations and rights of each party
- Credit risks can be managed via collateral

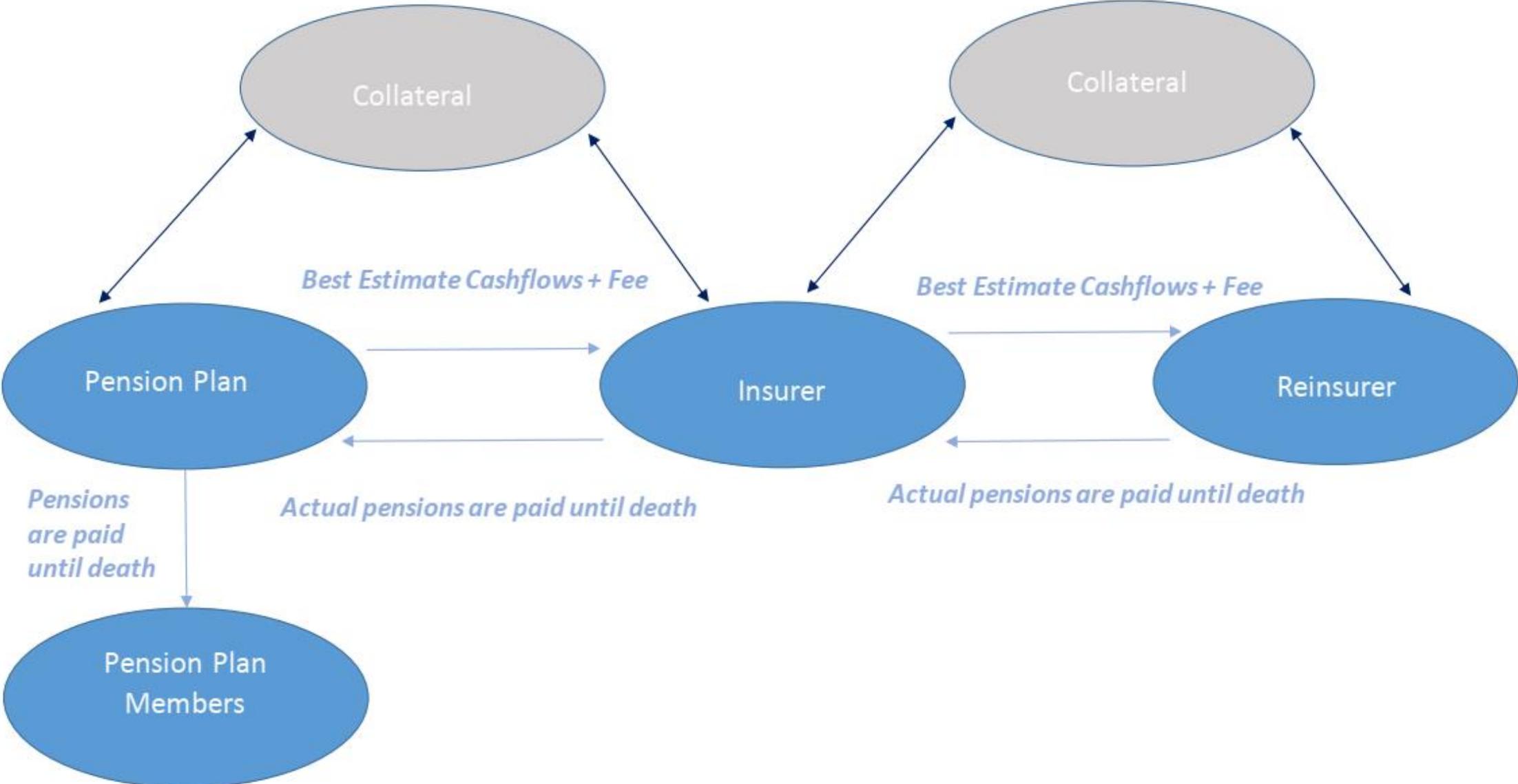
Pension Buy-out:

Pension Scheme pays an **upfront** premium to an insurer
Insurer pays all future pensions **directly** to the insured members
Full risk transfer – enables Scheme to wind up

Pension Buy-in:

Pension Scheme pays an **upfront** premium to an insurer
Insurer pays the pensions for the insured members **to the Scheme**
Policy is an asset to the Scheme who continues to pay members

Longevity Swap Illustration



What do Reinsurers Contribute

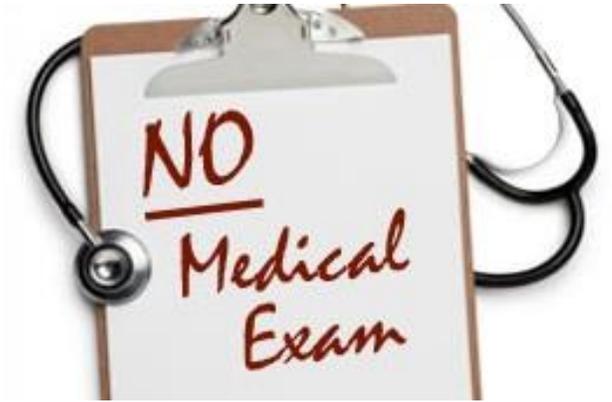
- Risk appetite/ capacity - but there is still plenty of uncertainty
- Better balance of mortality and longevity risks than Insurers
 - E.g., some global reinsurers approaching certain European insurers have a lot of mortality risk (from their life business) and want to offset with longevity risk (by buying local annuity books)
- Pricing expertise
- Longer term view
- It helps that mortality improvements are showing signs of slowing
- Better match of assets and liabilities
 - E.g., infrastructure loans and commercial mortgages
- Investment experience



Other Insurance Benefits – Direction of Underwriting

Market Examples of Evolving Mortality Drivers impacting Product Design (1)

- Development of Simplified U/W; Shortened Application processes. (More broad acceptance now of Effort V Price V Simplicity)
- EU Gender Equalisation on Protection and Annuities
- Cross-Sell – using *motor driver* vehicle experience **data** from Non-Life portfolio to cross sell Life Protection policies to the better risks



Market Examples of Evolving Mortality Drivers impacting Product Design (2)

- Bancassurer / Mortgage Provider – upsell to Mortgage Protection policyholders of further Protection policies based on good credit score fuelled by their own **data** (at least 20% of US life insurers use credit score **data** in u/w).
- Reductions in insurance premium for good Lifestyle behaviour and associated **data** – Vitality Life; use of wearable Tech
- The withdrawal of Whole of Life guaranteed premium plans



Market Examples of Evolving Mortality Drivers impacting Product Design (3)

- Conditions like HIV and Diabetes are now being insured following extensive **data** studies.



For More Details Call Now
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STAR
DIABETES SAFE
(MODIFIED)

Covers Type 1 & Type 2 Diabetes
For person aged between 18 years to 65 years

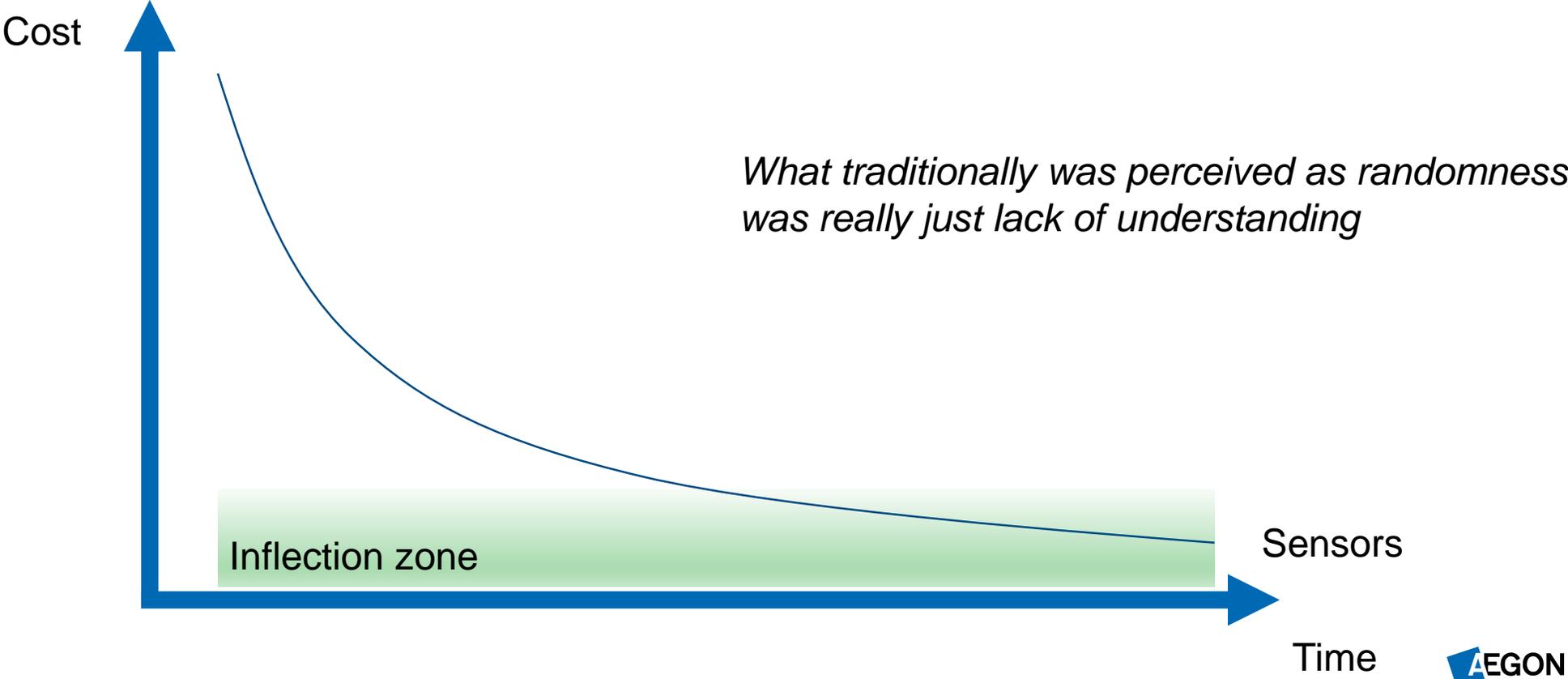
Market Examples of Evolving Mortality Drivers impacting Product Design (4)

- Digitisation and the real time use of many sources of **data** has allowed certain providers to “cherry pick” the market for the “best risks” that suits their strategy and business model e.g. Ladder Life



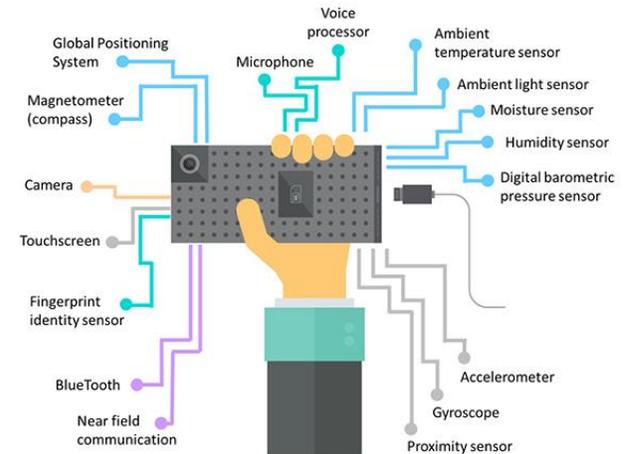
Costs of Sensors are Decreasing and Data Availability Increasing

Driving an inflection point for change in insurance, where prevention will, in many cases, be cheaper than indemnifying



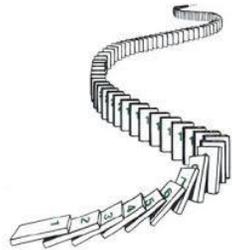
Tech Developments

- iWatch 4:
 - 2-lead ECG (only 4 years to integrate)
 - Better heart rate variability monitoring
 - E-sim ensures connectivity everywhere
 - Fall monitoring
- 4-lead ECG: CardioSecure
- #sensors in smart-phone
- Facial and body analytics
- Smart scales

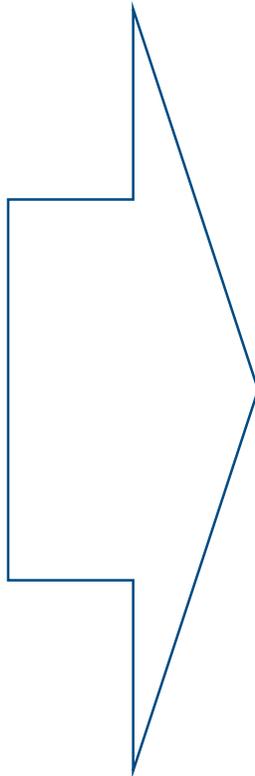


As a Result, the Role of Insurance Changes

Helping you when bad things happen



Price =
Expected claims +
Loading for Risk* +
Loading for Expense



Helping you prevent bad things from happening, but when they do, we will help you manage



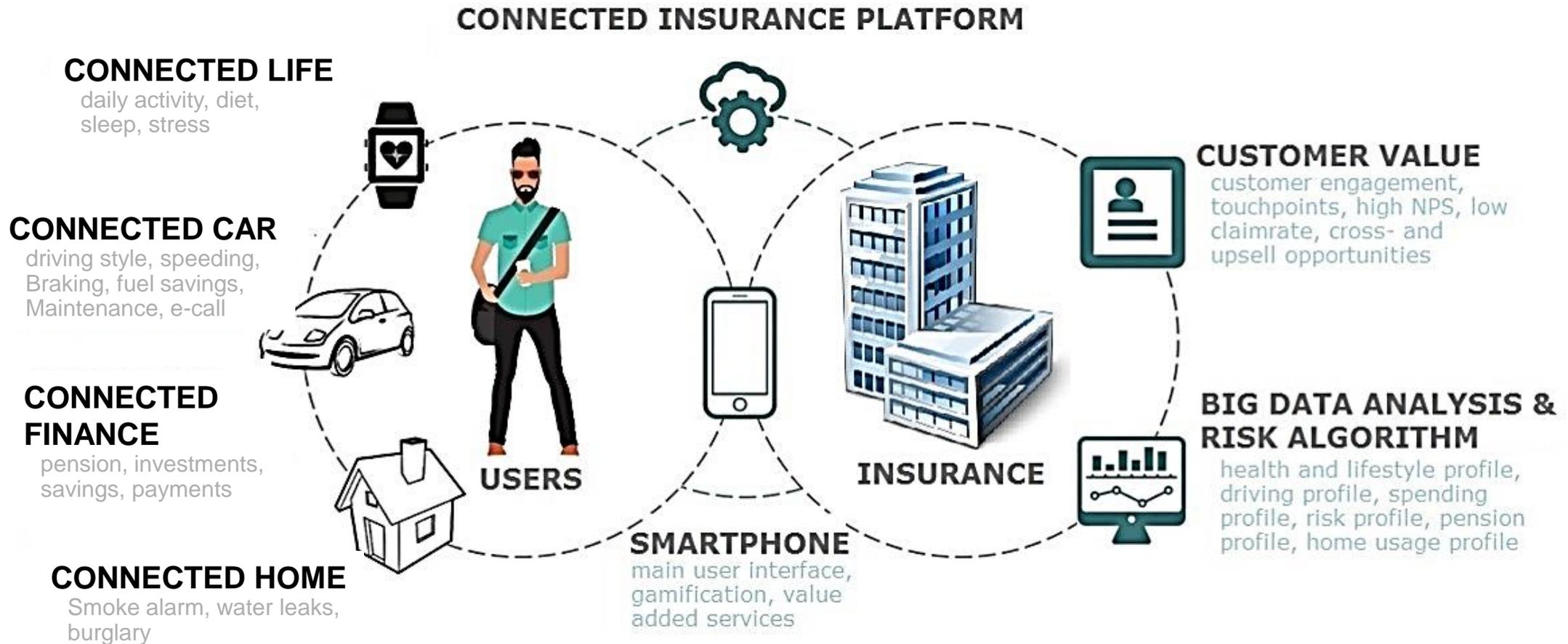
Expected claims: can be lowered through active engagement

Loading for Risk: can be lowered by more frequent touch-points as long as pricing can vary

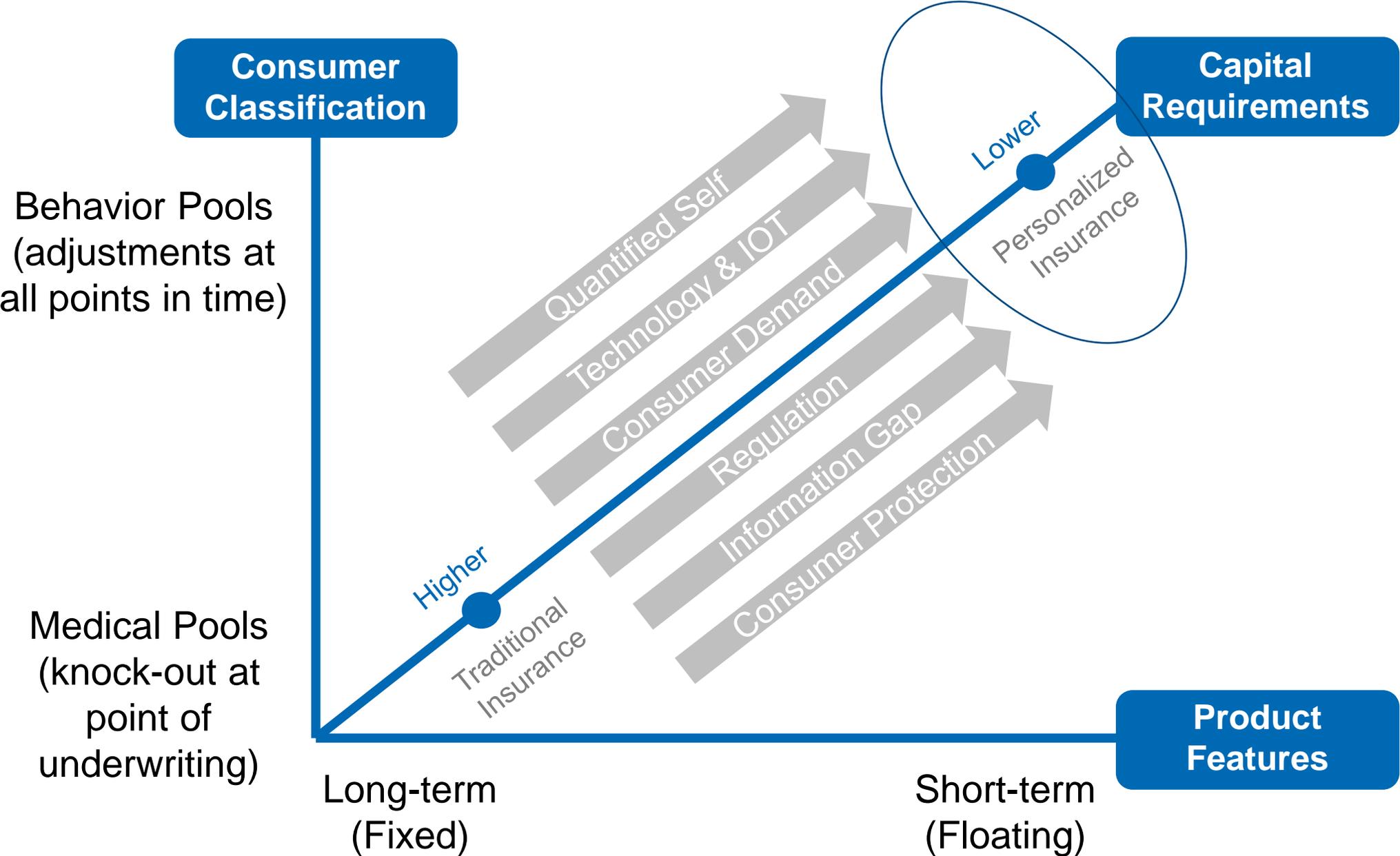
Loading for Expense: The greater the automation, the lower the expense

* Tends to be significantly higher for chronic conditions such as diabetes

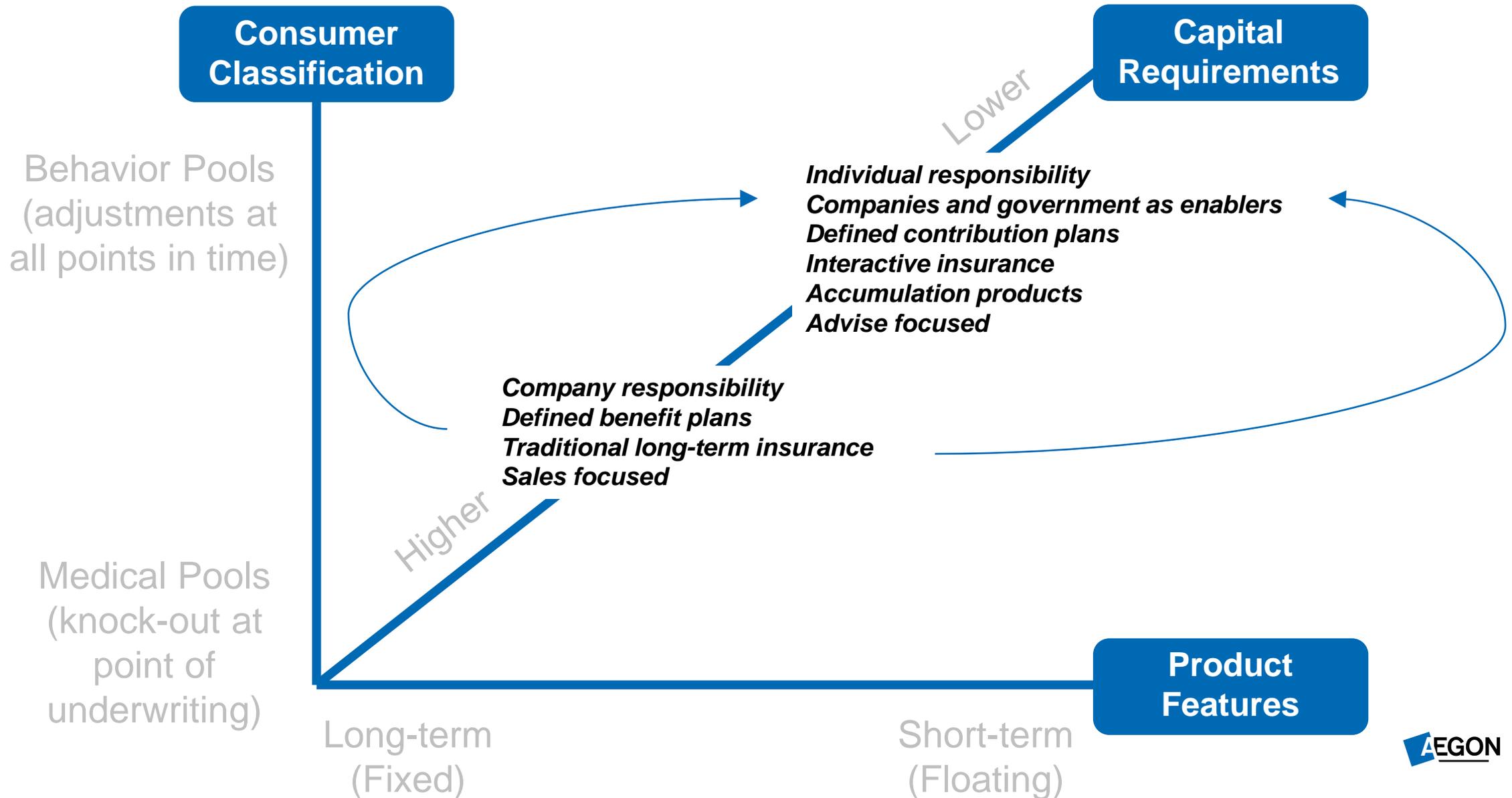
Everything is Becoming Personalized and Connected



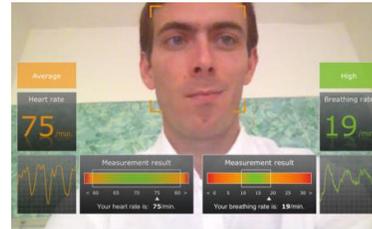
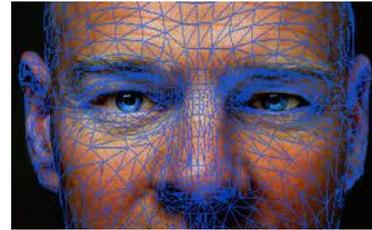
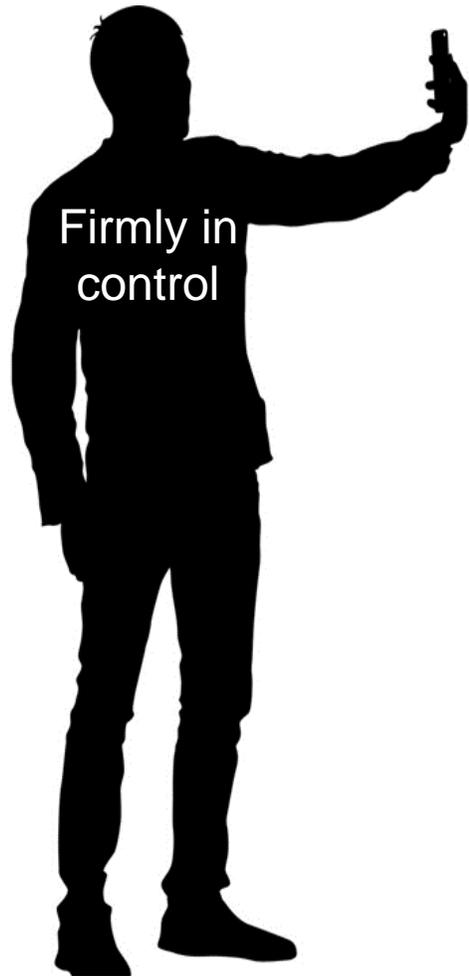
Product Structures Are Changing As Well



Supporting needs for better personal planning



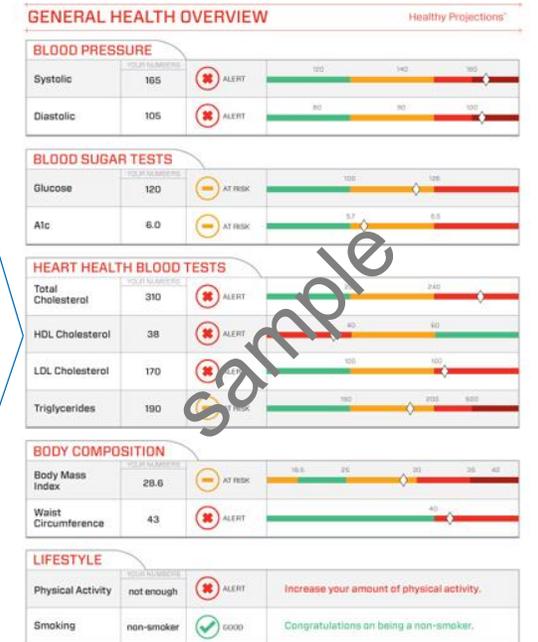
Digital Underwriting



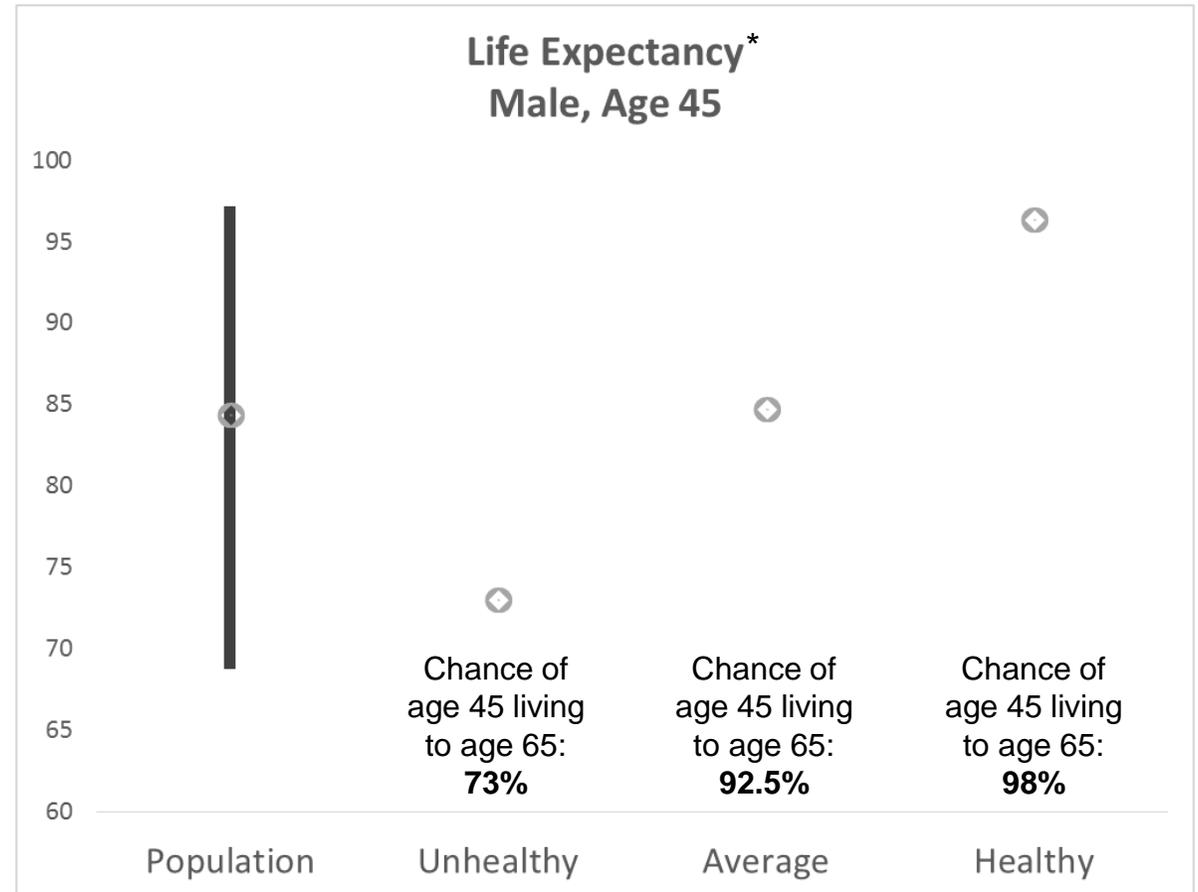
Examples

- Know Your Customer
- ID Scan
- Payment Information
- Age
- Gender
- Body Mass Index
- Smoking
- Pulse
- Breathing Rate
- Additional Information
- Medical Records
- Blood Work

Health Report & Underwriting

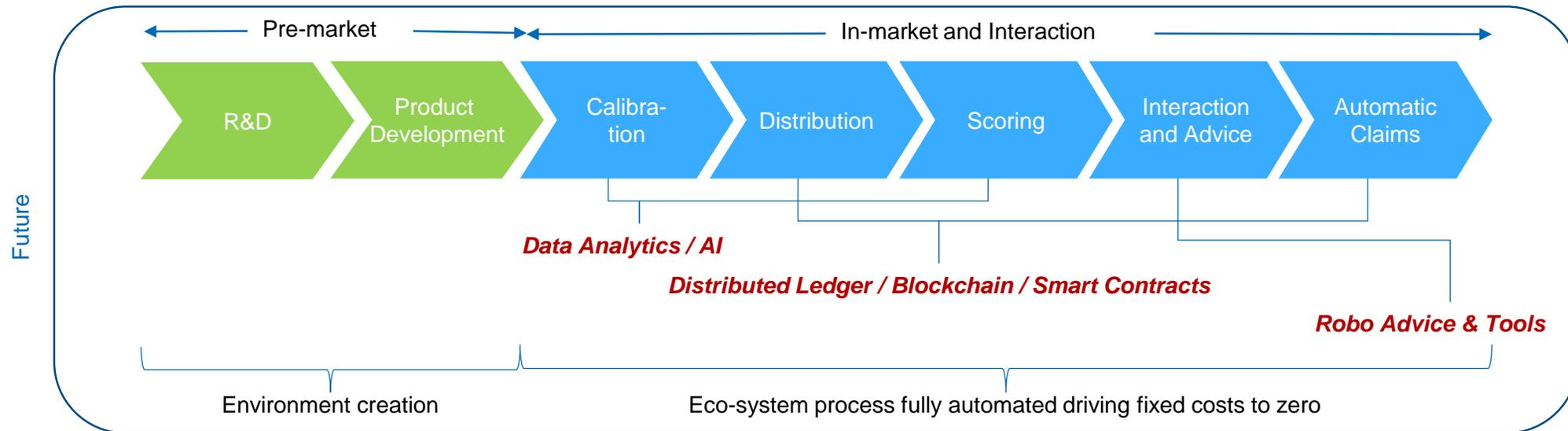
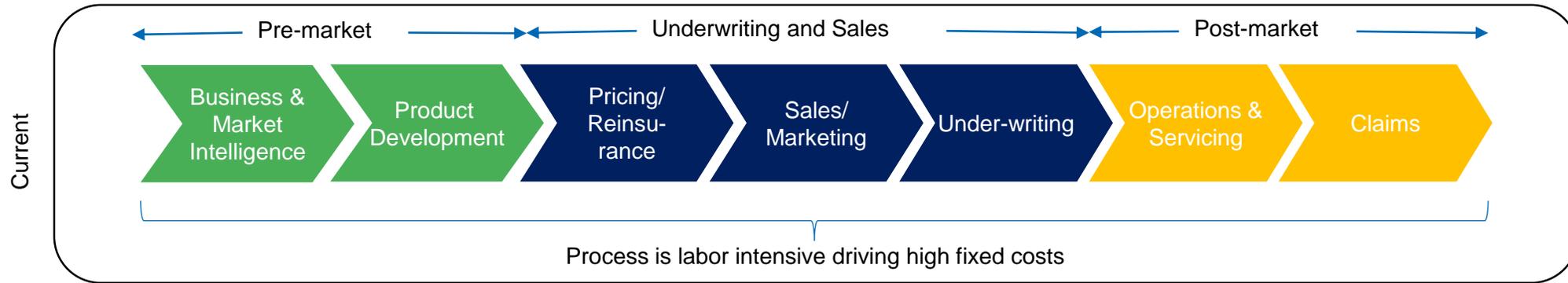


For Example: Assessing Life Expectancy Based on Lifestyle



* Dutch life expectancy

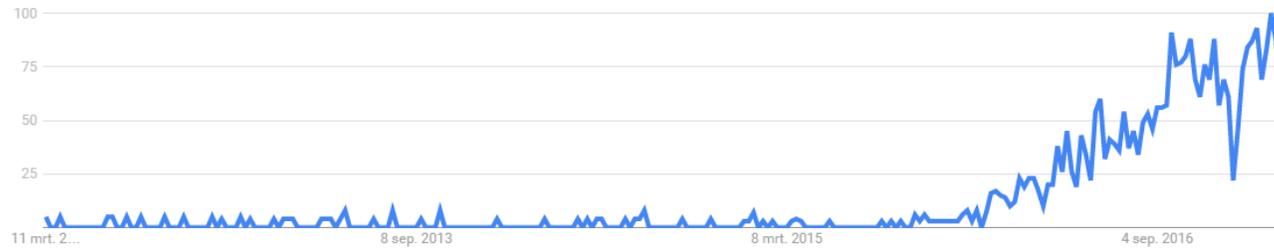
The value chain is also transforming and there's less time to complete process



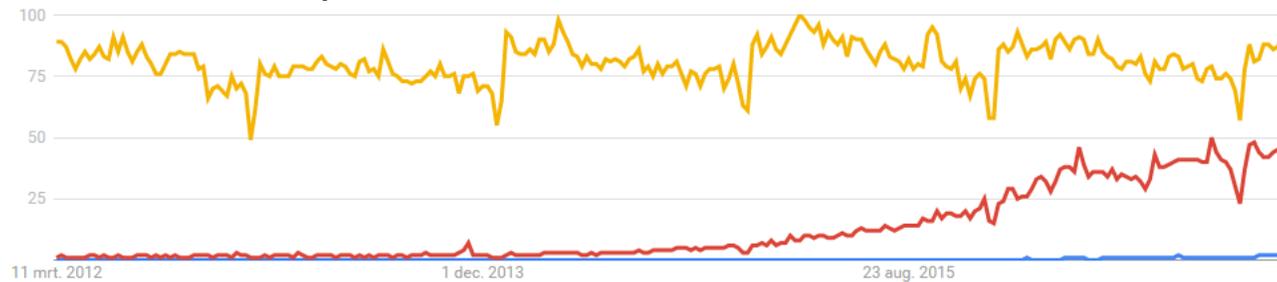
This opens the space to new players

Insurtech growth is still fairly nascent

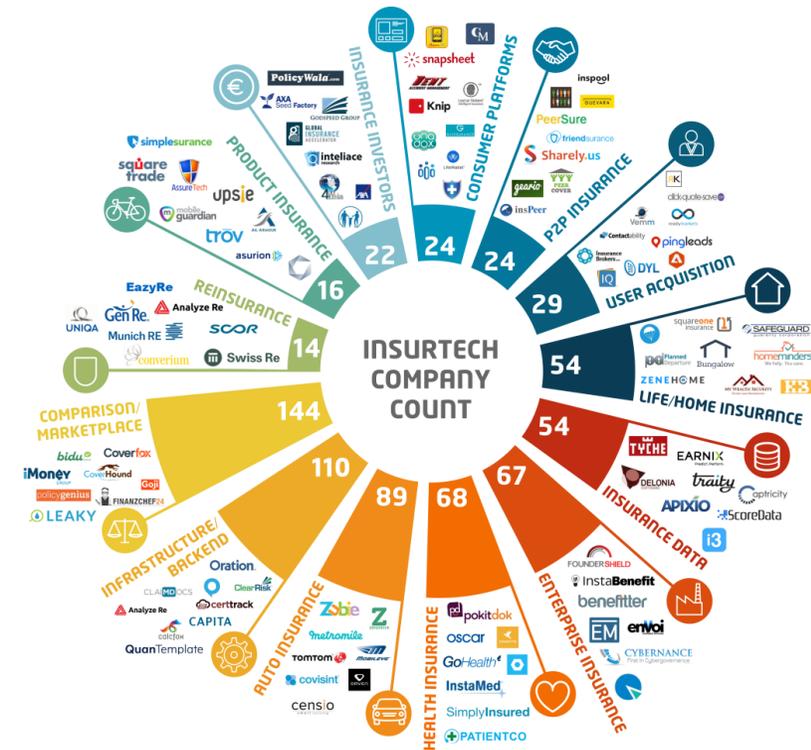
Level of Interest in Insurtech over time



Compared with Biotech and Fintech



Source: Google Trends



Source: Venture Scanner

In Summary

- Insurers of tomorrow will be health monitoring services with “bad luck” protection, but the scope of bad luck will narrow as precision medicine emerges.
- Responsibility and information will shift to individuals from institutions.
- Winning (re)insurers are developing fast data scoring algorithms and new product structures to generate competitive advantage. This drives down costs while potentially increasing accuracy, engagement and fairness. This further has the potential to change completely how we think about chronic illness – a vast largely unserved global market.



Questions?

Helping people achieve a lifetime of financial security