

CADWALADER

Cadwalader, Wickersham & Taft LLP  
[www.cadwalader.com](http://www.cadwalader.com)

# **Longevity Risk:** **1-in-100 Chance of a Trillion Dollar Loss**

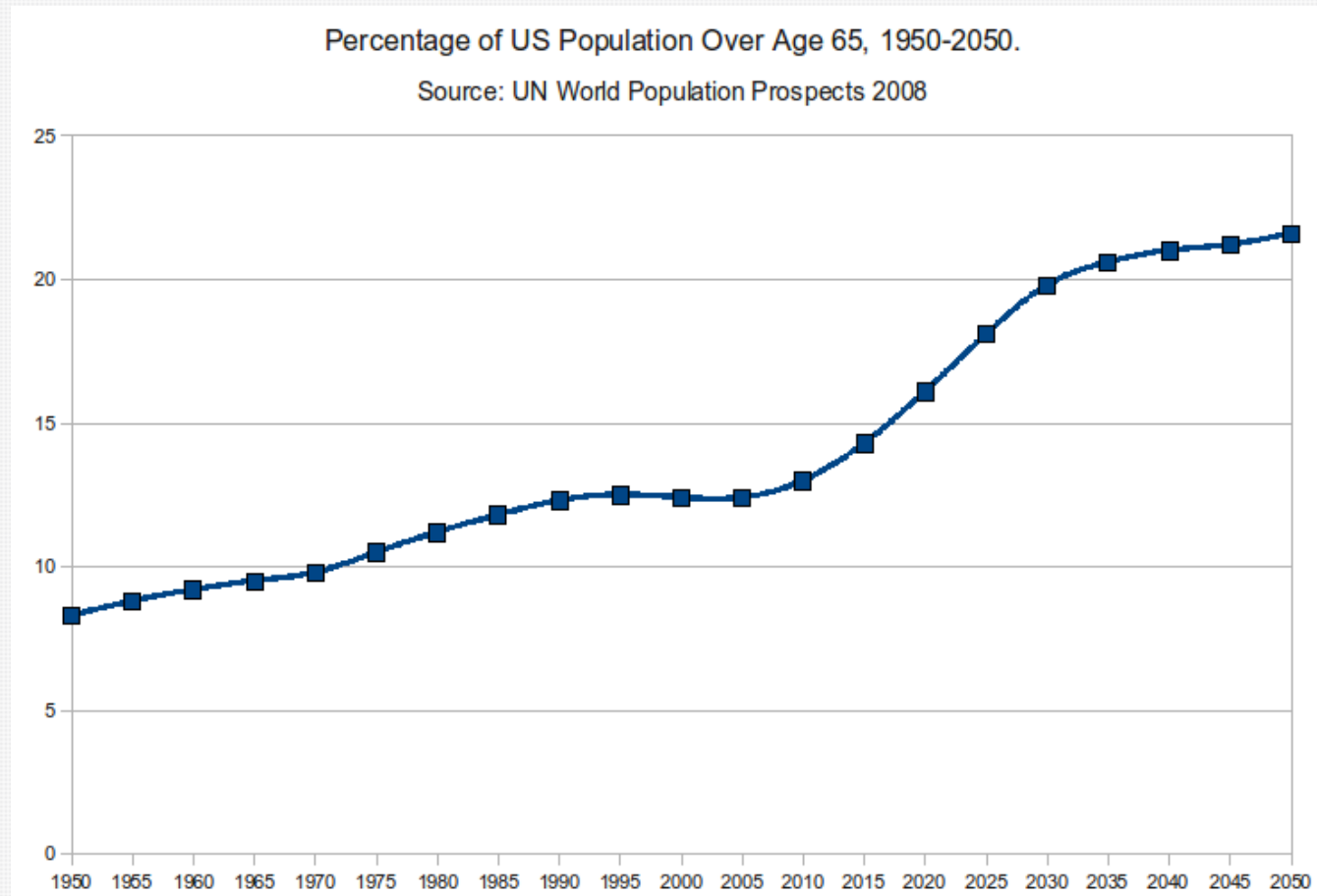
26 February 2014

# Rejuvenation biotechnology:

the sweet spot between prevention and  
treatment of age-related ill-health

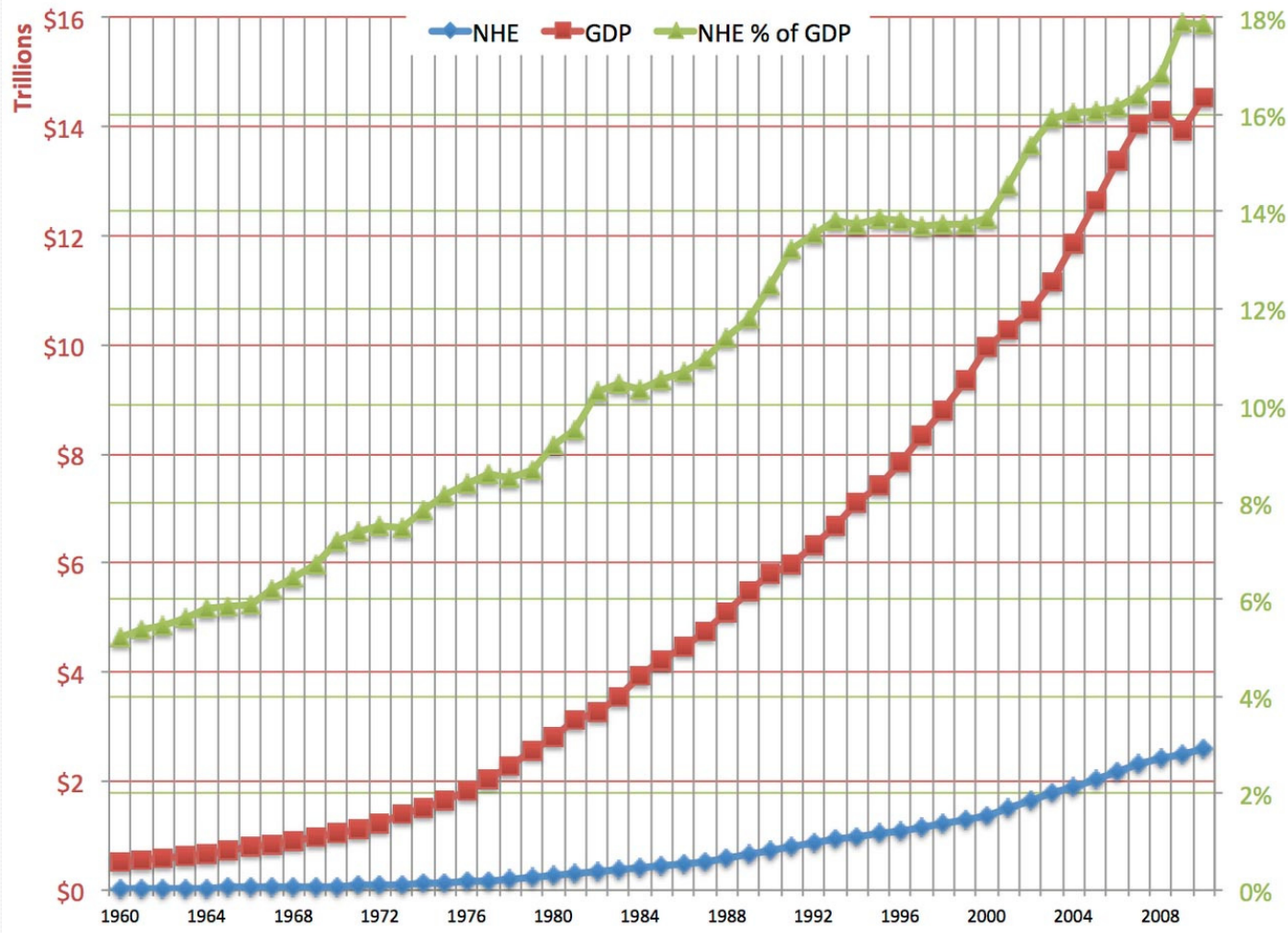
*Aubrey D.N.J. de Grey, Ph.D.*  
*Chief Science Officer*  
*SENS Research Foundation*  
[aubrey@sens.org](mailto:aubrey@sens.org)  
<http://www.sens.org/>

# The aging population



\* Source: [http://esa.un.org/wpp/unpp/panel\\_population.htm](http://esa.un.org/wpp/unpp/panel_population.htm)

# The economics of aging



Source: <http://sambaker.com/econ/classes/nhe10/>

If historical rates continue, US healthcare spending will be 34% of GDP by 2040. Source: <http://www.whitehouse.gov/administration/eop/cea/TheEconomicCaseforHealthCareReform>

In 2010, the US spent \$1.186 trillion on healthcare for people 65+ Source: [http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/us\\_dchs\\_2012\\_hidden\\_costs112712.pdf](http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/us_dchs_2012_hidden_costs112712.pdf)

# Age-related vs. infectious diseases

- Most infectious diseases have been easily prevented
  - Sanitation
  - Vaccines
  - Antibiotics
  - Carrier control
- Age-related diseases have not. Why not?

# Well... what is 'aging', exactly?

Aging is:

The life-long accumulation of damage to the tissues, cells, and molecules of the body that occurs as an intrinsic side-effect of the body's normal operation.

The body can tolerate some damage, but too much of it causes disease and disability.

# A bizarrely underappreciated truth

Age-related diseases are caused by aging!

Thus, they are:

- widespread now that infections are “rare”
- staggeringly costly
- universal if you live long enough
- not medically curable, in the strict sense

But they, and aging itself, are nonetheless:

- medical problems
- medically preventable in principle

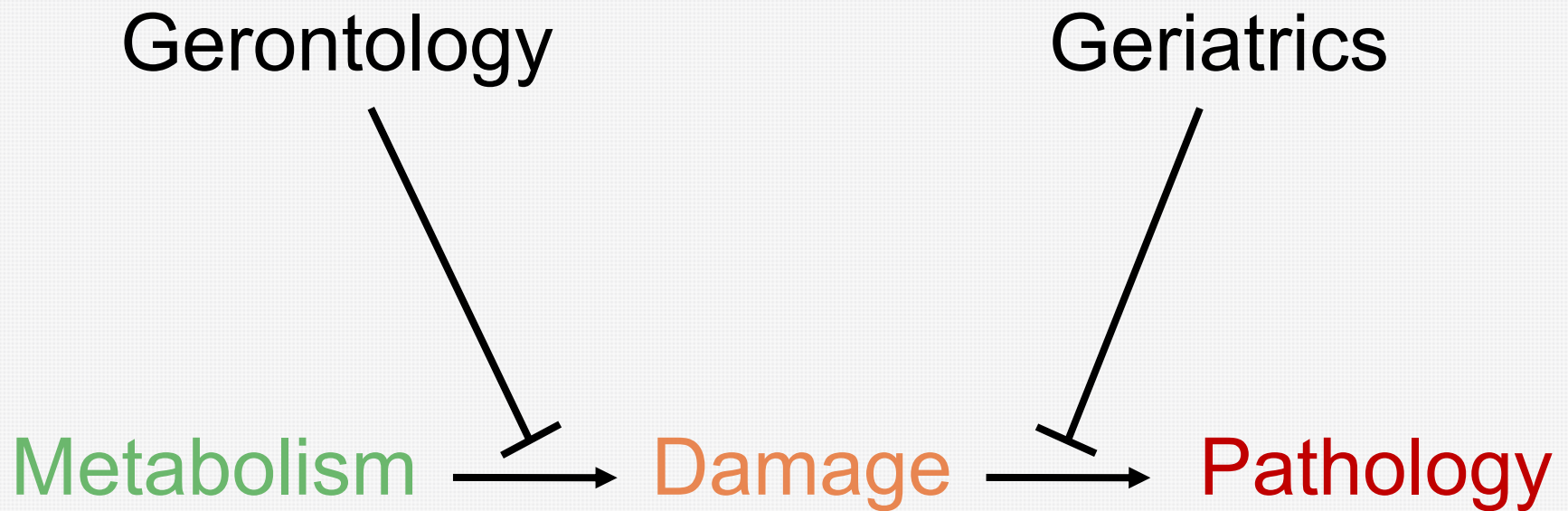
# What this misguidedness means in \$\$

Even though 90% of US deaths and at least 80% of US medical costs are caused by aging:

National Institutes of Health budget (\$M)	~30,000
National Institute of Aging budget	~1,000
Division of Aging Biology budget	~150
Spent on translational research (max)	~10
SENS Research Foundation budget	~5



# How age-related disease is addressed today



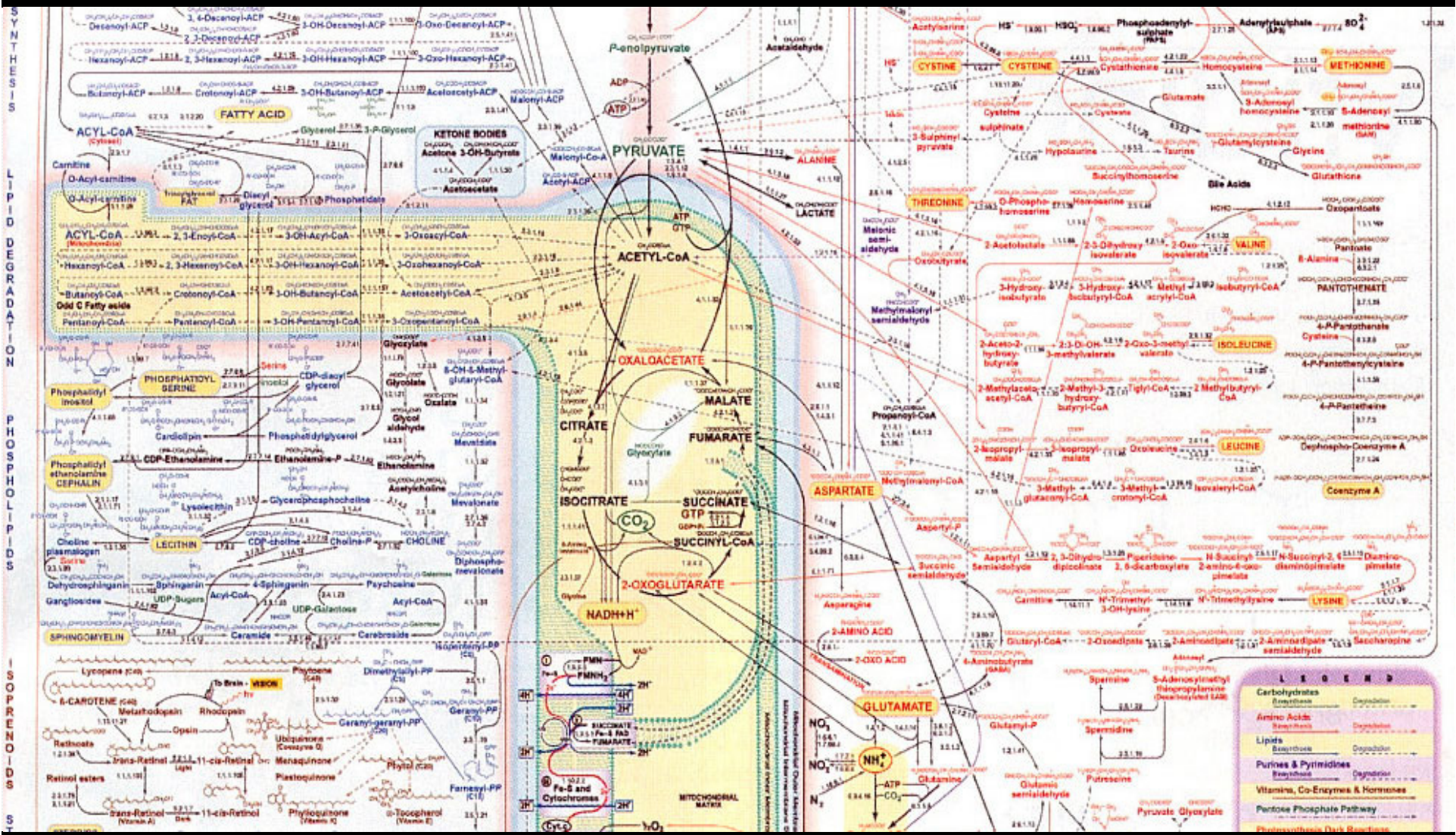
# Targeting pathology: tricky

presbycusis  
osteoporosis  
osteoarthritis  
autoimmunity  
greying hair  
presbyopia  
cataract  
glaucoma  
temporal arteritis  
polymyalgia rheumatica  
wrinkling  
Alzheimer's disease  
Pick's disease  
corticobasal degeneration  
progressive supranuclear palsy  
Parkinson's disease  
multiple system atrophy  
dementia with Lewy bodies  
sarcopenia  
glomerulonephritis  
senile cardiac amyloidosis  
atherosclerosis  
arteriosclerosis  
age-related macular degeneration  
cardiomyopathy  
diastolic heart failure  
cancer  
systemic inflammation  
oxidative stress  
reduced coronary blood flow  
loss of cardiac reserve  
andropause  
thymic involution  
reduced plasma renin activity  
reduced aldosterone  
reduced melatonin diurnal rhythm

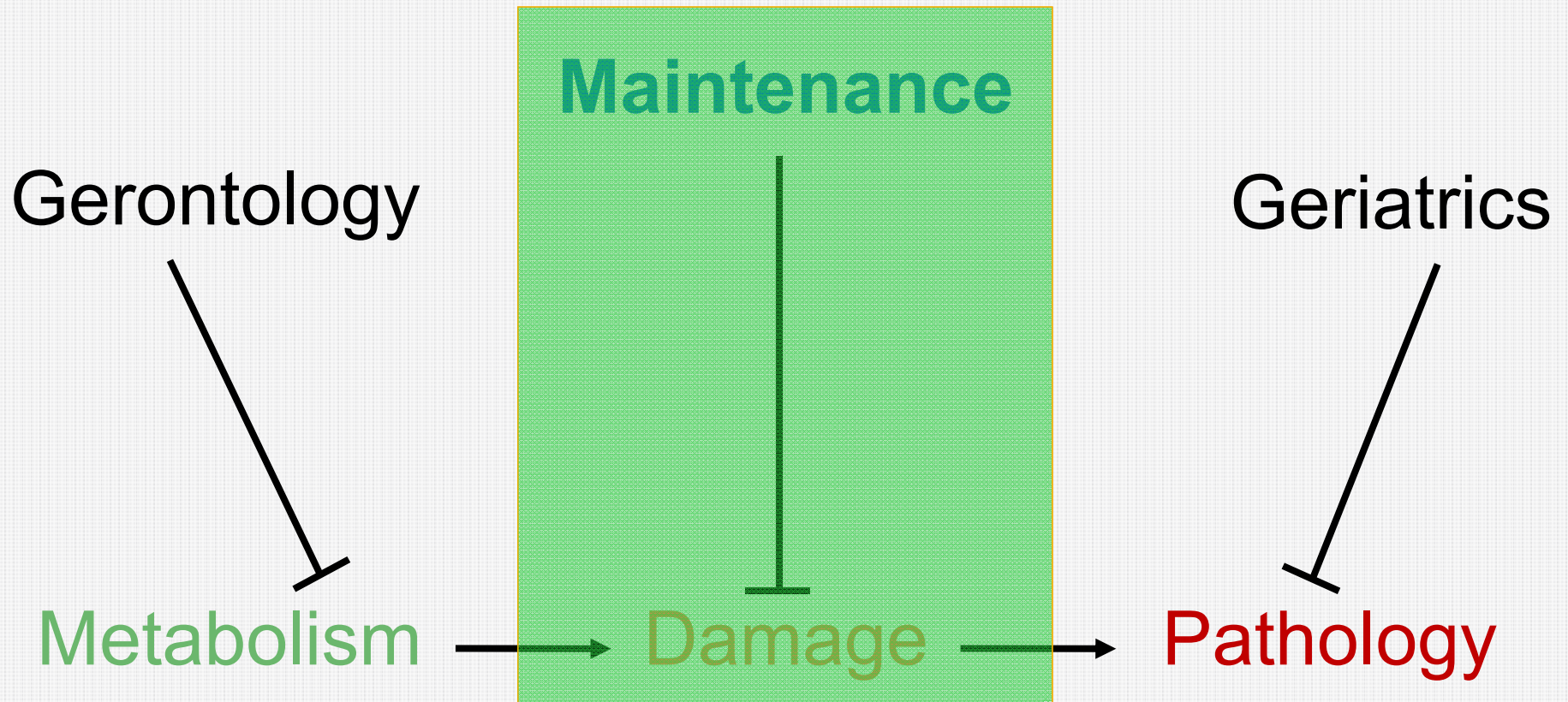
reduced light adaptation  
reduced ethanol metabolism  
altered drug pharmacokinetics  
somatopause  
loss of cardiac adaptability  
incontinence  
impaired wound healing  
idiopathic axonal polyneuropathy  
autonomic neuropathy  
arrhythmia  
chronic obstructive pulmonary disorder  
benign prostatic hypertrophy  
menopause  
leukoaraiosis  
stroke  
vascular dementia  
frontotemporal dementia  
immunosenescence  
anosmia  
cachexia  
anorexia of aging  
systolic hypertension  
ageusia  
erectile dysfunction  
orthostatic hypotension  
impaired adaptive beta-cell proliferation  
fibroblast collapse  
anergic T-cell clones  
cellular senescence  
vascular calcification  
impaired transdermal absorption  
impaired thermoregulation  
reduced tactile acuity  
impaired vasoconstriction  
loss of neuromuscular junctions  
delayed withdrawal reflex

impaired pH maintenance  
reduced chemical clearance  
altered dermal immune cell residence and function  
aberrant allergic and irritant reactions  
loss of skin elasticity  
impaired vitamin D synthesis  
reduced renal reserve  
renal cortex atrophy  
gut dysbiosis  
loss of jejunal villus height  
impaired response to vaccination  
impaired thirst  
lentigo senilis  
thinning hair  
impaired proprioception  
impaired balance  
reduced vital capacity  
reduced cardiorespiratory endurance  
impaired sweat response  
impaired blood distribution  
nutrient malabsorption  
diverticular disease  
presbyphagia  
increased reflux  
alveolar loss  
neuronal loss  
senile emphysema  
degenerative disc disease  
joint calcification  
pineal calcification  
aberrant differentiation  
gait instability  
frontal demyelination  
axonal atrophy  
impaired functional connectivity  
impaired working memory

# Targeting metabolism: also tricky



# Maintenance: targeting damage



**Claim:** unlike the others, the maintenance approach can deliver a big extension of human healthy lifespan quite soon

# Comparison: car maintenance



# Categorizing damage

## Damage type

Cell loss, cell atrophy

Division-obsessed cells

Death-resistant cells

Mitochondrial mutations

Intracellular junk

Extracellular junk

Extracellular matrix stiffening

No new type of  
damage  
confirmed  
since 1982

And, I've said  
so without  
challenge  
since 2002

# Diseases by damage type

## Damage type

Cell loss, cell atrophy

Division-obsessed cells

Death-resistant cells

Mitochondrial mutations

Intracellular junk

Extracellular junk

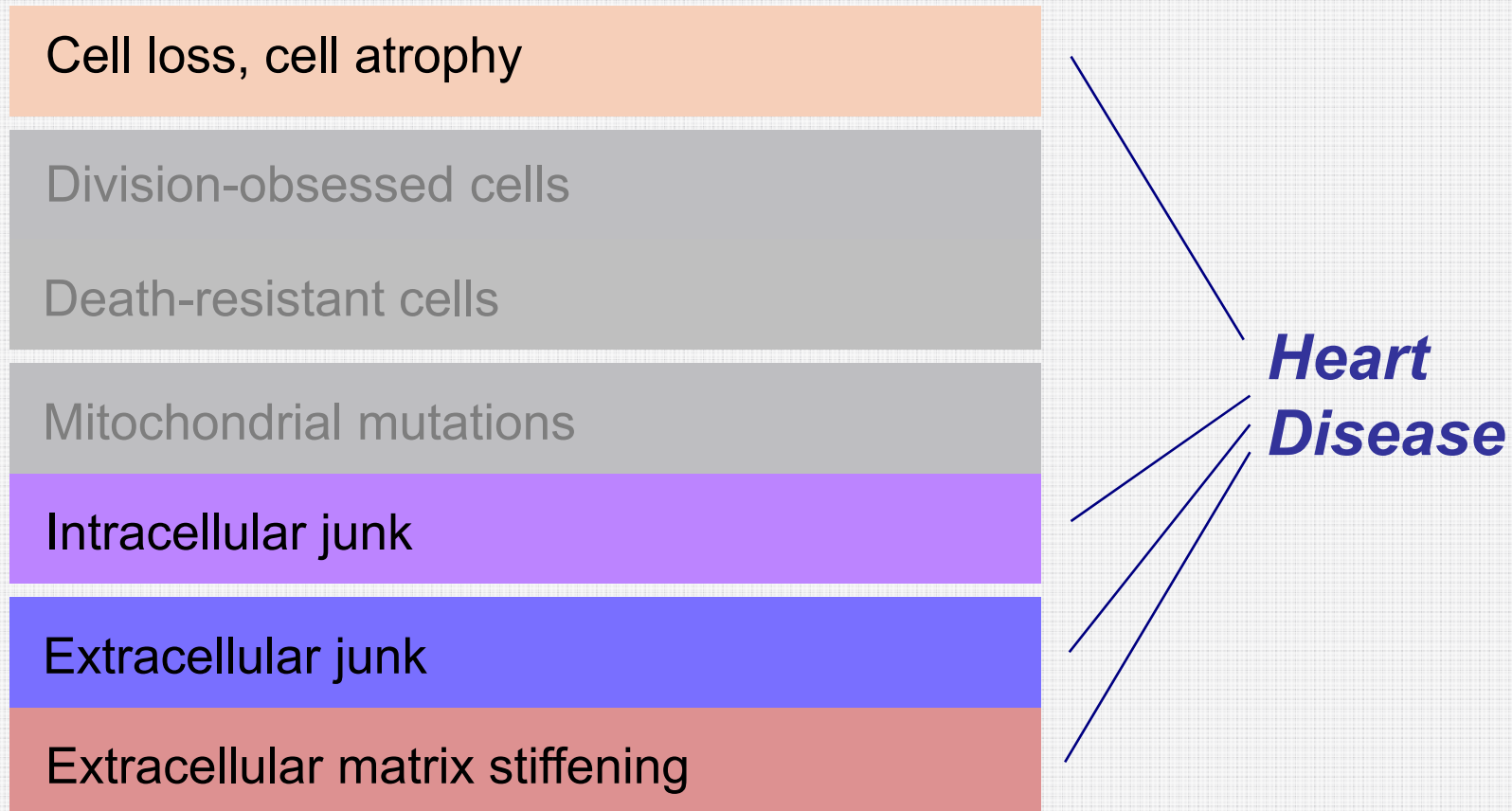
Extracellular matrix stiffening

**Cancer**



# Diseases by damage type

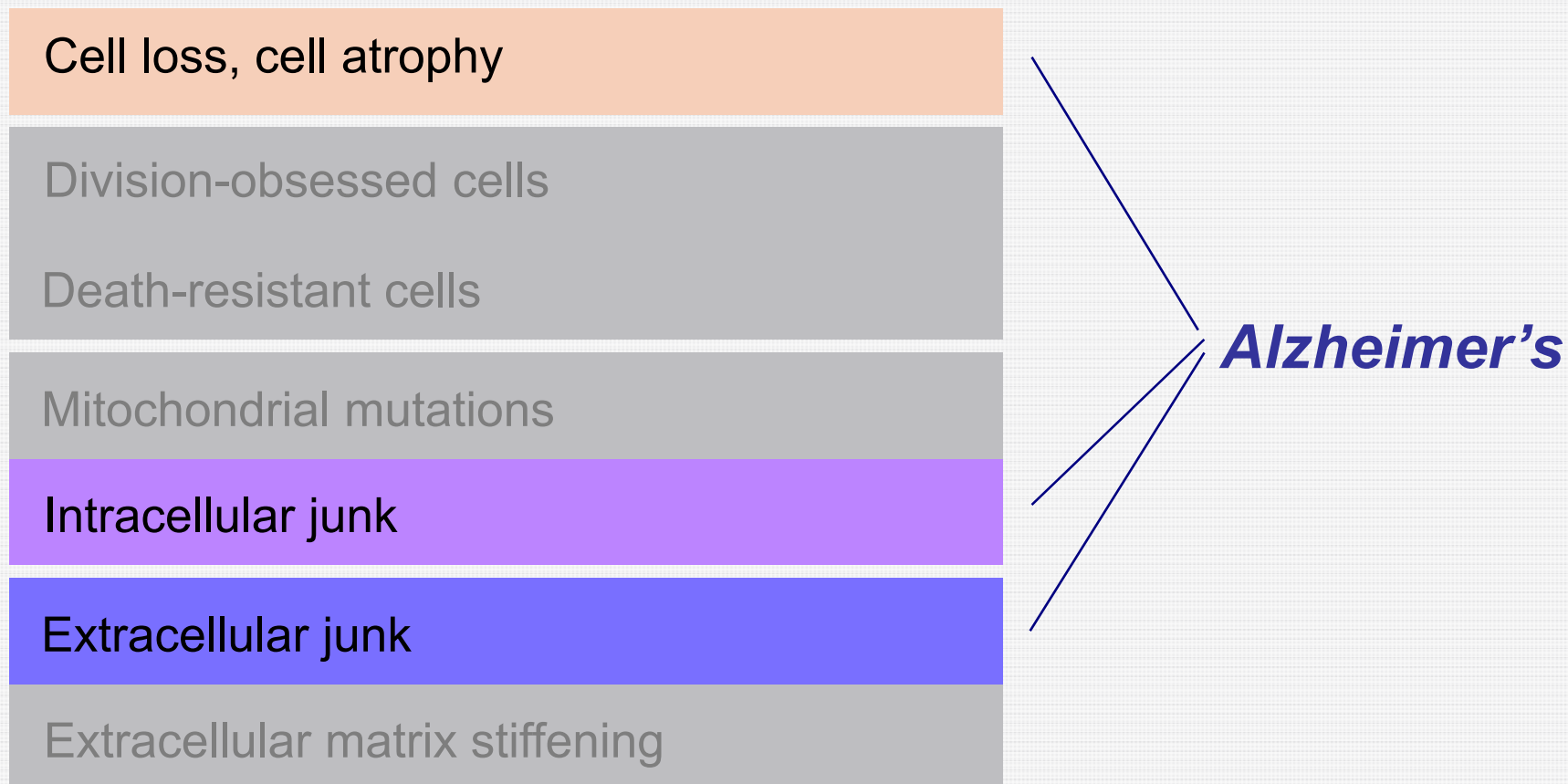
## Damage type





# Diseases by damage type

## Damage type



# Frailty shares the same causes

## Damage type

Cell loss, cell atrophy

Division-obsessed cells

Death-resistant cells

Mitochondrial mutations

Intracellular junk

Extracellular junk

Extracellular matrix stiffening

***Non-specific  
Decrepitude***

A diagram illustrating the causes of frailty. On the left, seven horizontal bars of different colors represent different types of damage: orange (Cell loss, cell atrophy), grey (Division-obsessed cells), green (Death-resistant cells), light blue (Mitochondrial mutations), purple (Intracellular junk), blue (Extracellular junk), and red (Extracellular matrix stiffening). On the right, the text 'Non-specific Decrepitude' is written in a bold, italicized blue font. Seven blue lines radiate from this text, pointing towards each of the seven damage bars on the left, indicating that all these damage types contribute to non-specific decrepitude.

# The “how” of preventative maintenance

- Replace
- Remove
- Repair
- Reinforce

# Addressing each category

## Damage type

## The maintenance approach

Cell loss, cell atrophy

Cell therapy, mainly

Division-obsessed cells

Telomerase/ALT gene deletion  
plus periodic stem cell reseed

Death-resistant cells

Suicide genes, immune stimulation

Mitochondrial mutations

Allotopic expression of 13 proteins

Intracellular junk

Transgenic microbial hydrolases

Extracellular junk

Phagocytosis by immune stimulation

Extracellular matrix stiffening

AGE-breaking molecules/enzymes

# How BIG is the longevity side-benefit?

- Western mortality rate in the 20s is under  $10^{-3}/y$
- If it didn't rise with age (and in fact it will very probably fall), most people would live to over 1000
- Rejuvenation therapies may never be perfect; first-generation version may give “only” ~30y extra life
- However, that would buy us time to develop better ones with which to re-rejuvenate the same people, and so on (“longevity escape velocity”)
- Period life expectancy will very suddenly become incalculable (literally!)

# How NEAR is the longevity side-benefit?

- This is pioneering technology, so we don't know
- Guess: 50% chance in 20-25y if funding rises soon
- At least 10% chance it'll take >100y
- That's for the therapies I've mentioned today
- They will probably give around 30yr extra life
- LEV thenceforth seems inevitable to me...
- **Everyone will understand the above this decade**

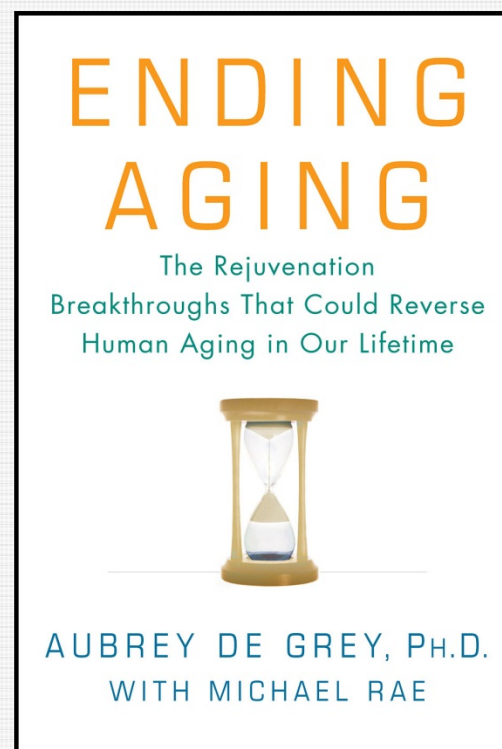
# Learn more

Read the (semi-technical) book.

Available at Amazon and all good book stores.  
Paperback is cheaper, and has an extra chapter!

Visit us on the web at  
<http://www.sens.org/>

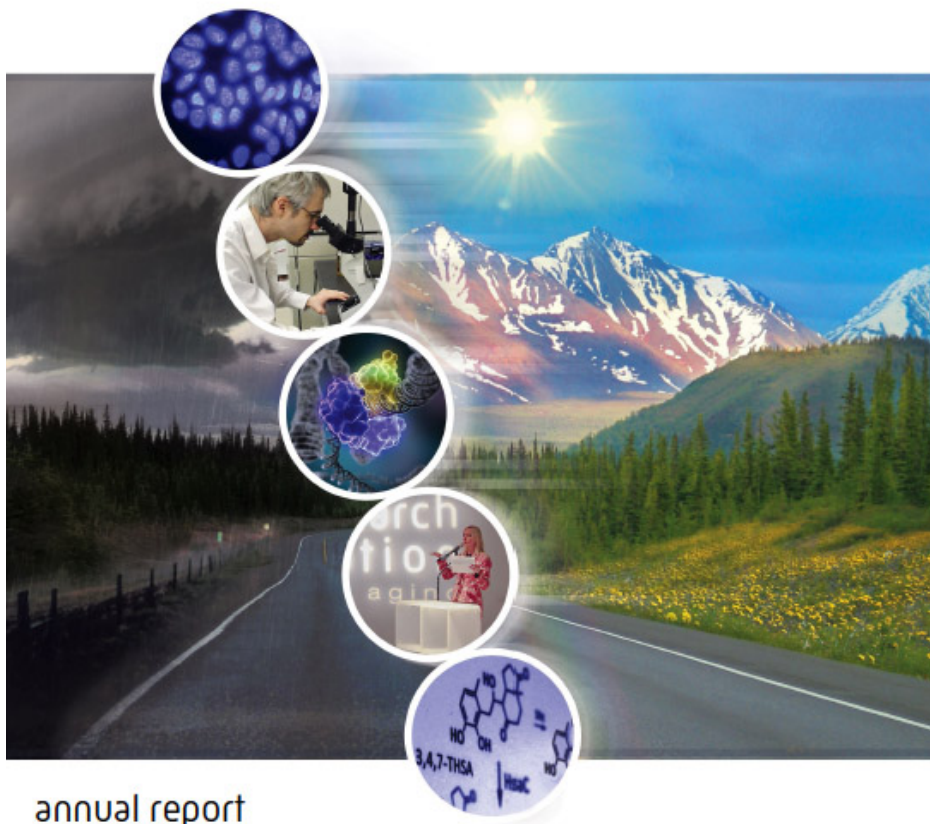
Drop us a line at  
[foundation@sens.org](mailto:foundation@sens.org)



# Our latest annual report

sens research foundation

 reimagine aging



annual report


april 2013

<http://www.sens.org/about/organizational-reports>

20 pages of comprehensive information about all of our research, our outreach and education initiatives, our financials and our plans for the future

(A more detailed research report is also available)

sens research foundation

 reimagine aging





sens research foundation

reimagine aging

[www.sens.org](http://www.sens.org)

[aubrey@sens.org](mailto:aubrey@sens.org)



# Incorporating Medical Developments Into Pension Liability Assessment

Analytics to Assist the Development  
of the Longevity Market

Dr. Andrew Coburn  
Senior Vice President  
Risk Management Solutions

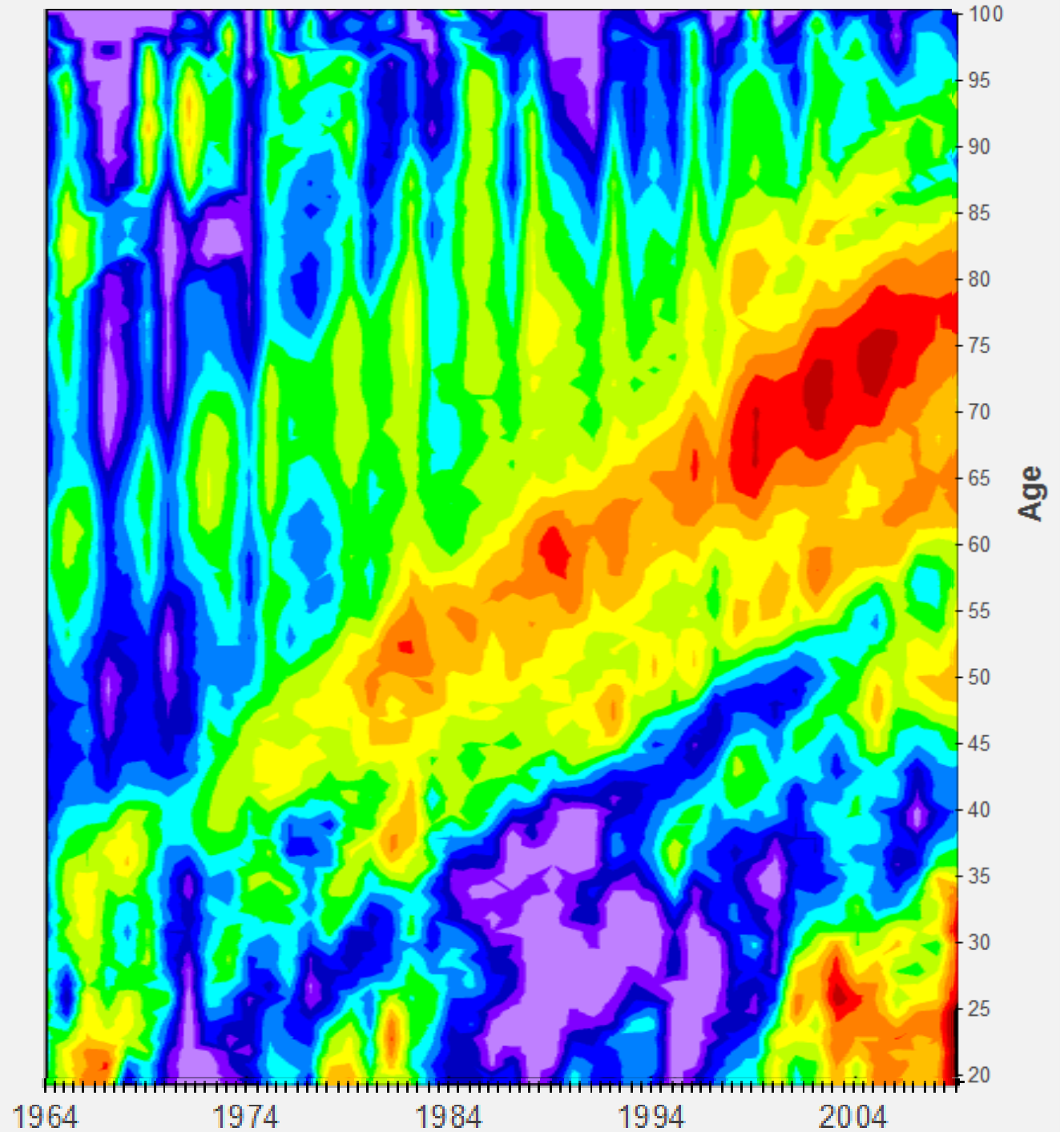
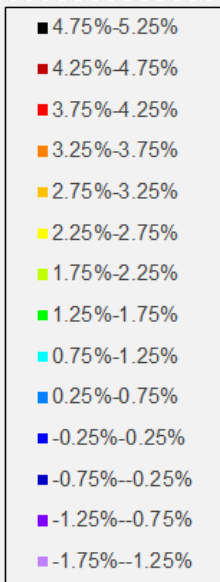




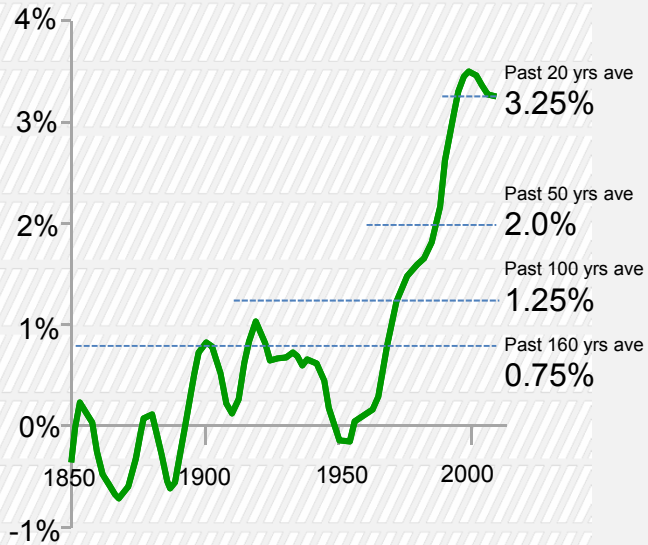
**How can we account for future medical developments in assessing pension liabilities?**

## Start with current mortality burden

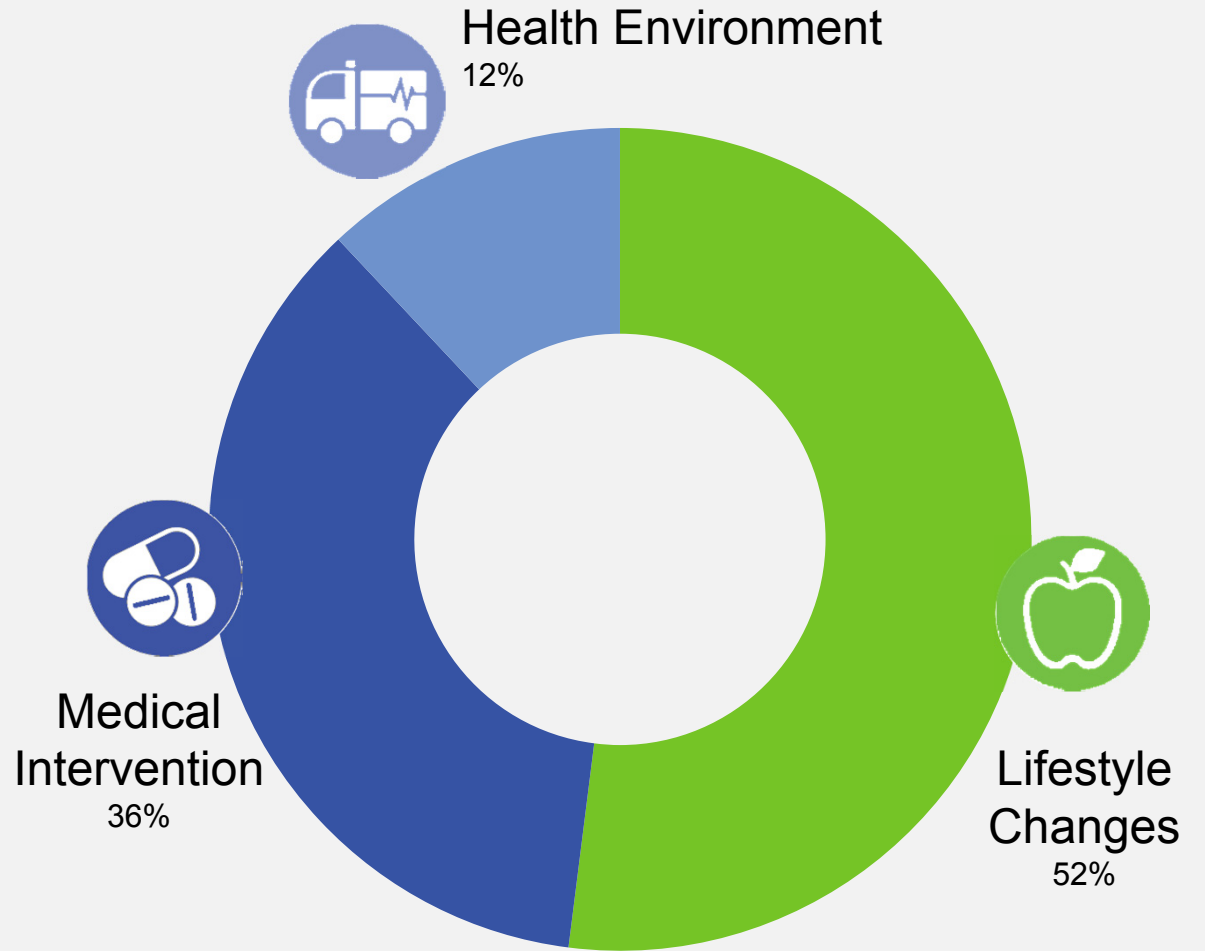
Mortality change,  
year-on-year  
Males, UK



# Understand current drivers of change



Mortality Improvements UK males aged 65





## RMS Vitagions



### Lifestyle Changes

Giving up smoking  
Reducing obesity levels  
Improving health



### Medical Intervention

Treatments for leading  
causes of premature  
death – CVD, cancer



### Health Environment

Public health & safety  
improvements, sanitation,  
safer roads



### Regenerative Medicine

Emerging treatments for  
repairing damaged  
biological systems



### Anti-Aging Processes

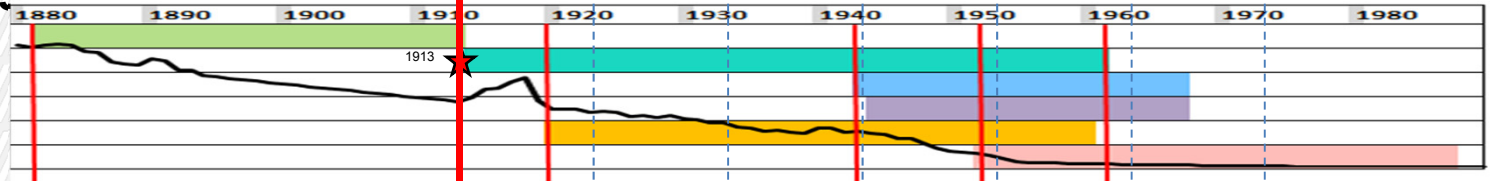
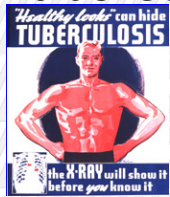
Treatments to extend life  
by interfering with natural  
aging process

# Look at timelines for past public health breakthroughs

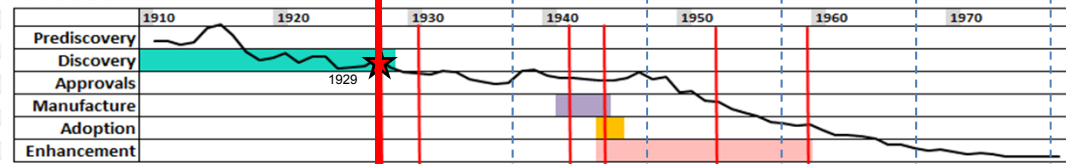
Discovery

10 20 30 40 50 60 years

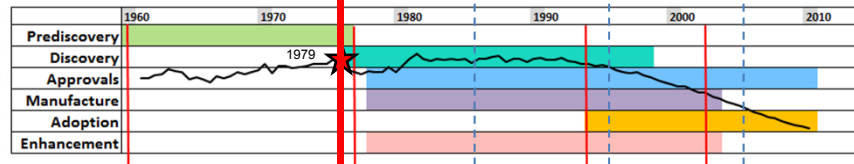
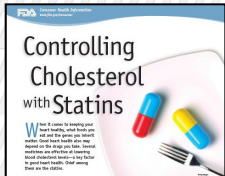
## Tuberculosis



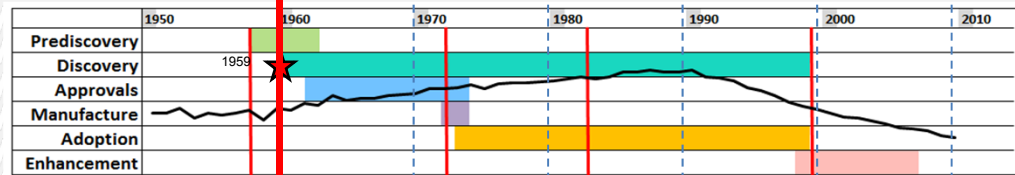
## Penicillin



## Statins

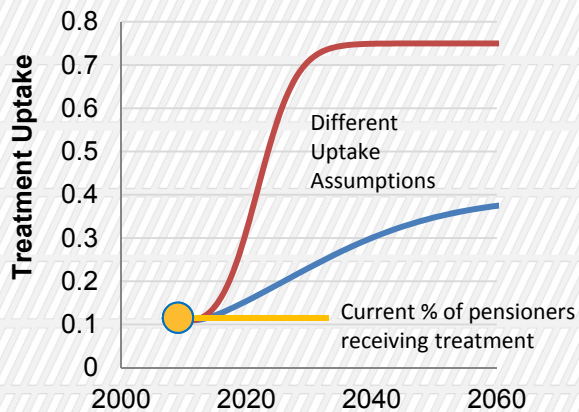


## Breast cancer



# Typical Breakthrough Process

- Prediscovery
- Discovery
- Approvals
- Adoption
- Enhancement

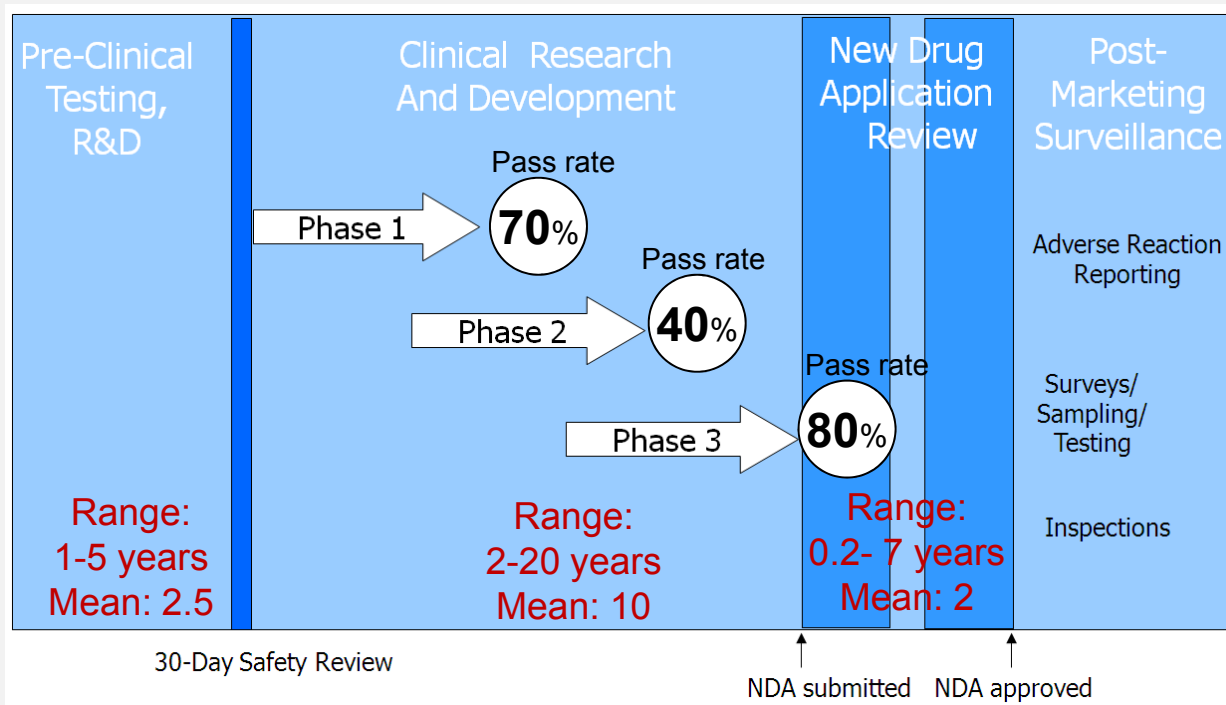




# Approving a new drug takes time

## U.S. Food & Drug Administration and European Medicines Agency New Drug Approval Process

Average time to approve a new drug is 15 years



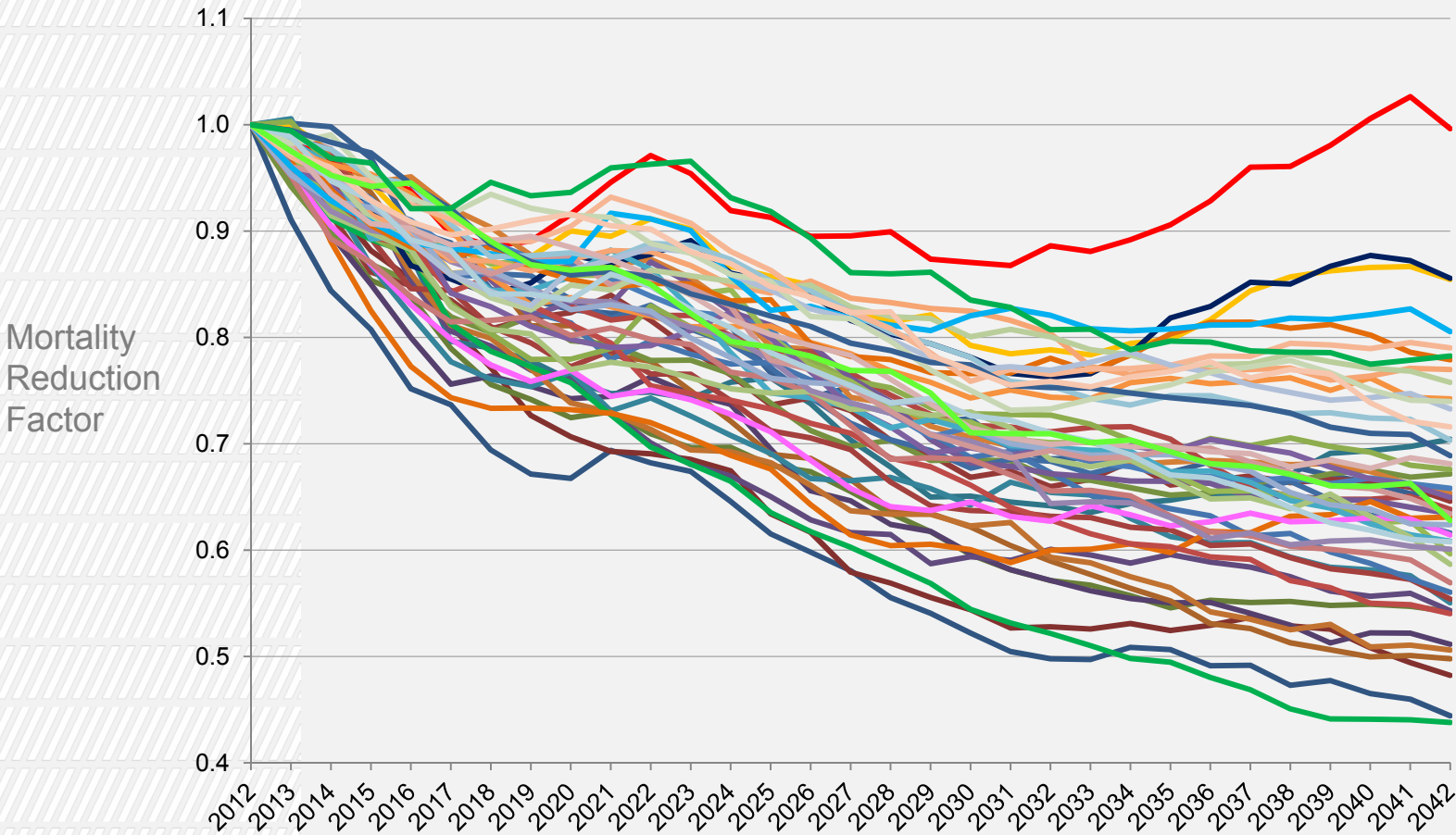
### Overall Pass Rate

22%

We also model what would happen if approval processes became quicker – or slower



# 100,000 possible futures



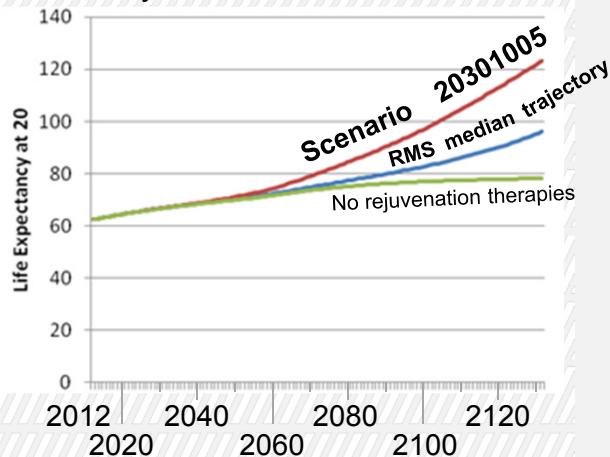
## Assessing anti-aging impacts

The RMS longevity risk model, in use since 2009, includes projections of rapid achievement of anti-aging treatment

### RMS Scenario # 20301005

- Treatment available in 20 years (2034)
- Generates additional LE of 30 years for a 20 year old by 2086
- Escape Velocity: First 1000 year old is born 2100

Period Life Expectancy of 20 year old UK male



Liability Annuity Factor 5% discount, 3% escalation	Typical Portfolio Pensions in Payment Mean age 70; SD 10	Portfolio of 20 Yr Old Males
Reference View	15.56	38.70
Scenario 20301005	15.63	41.15
Change	0.5%	6.3%

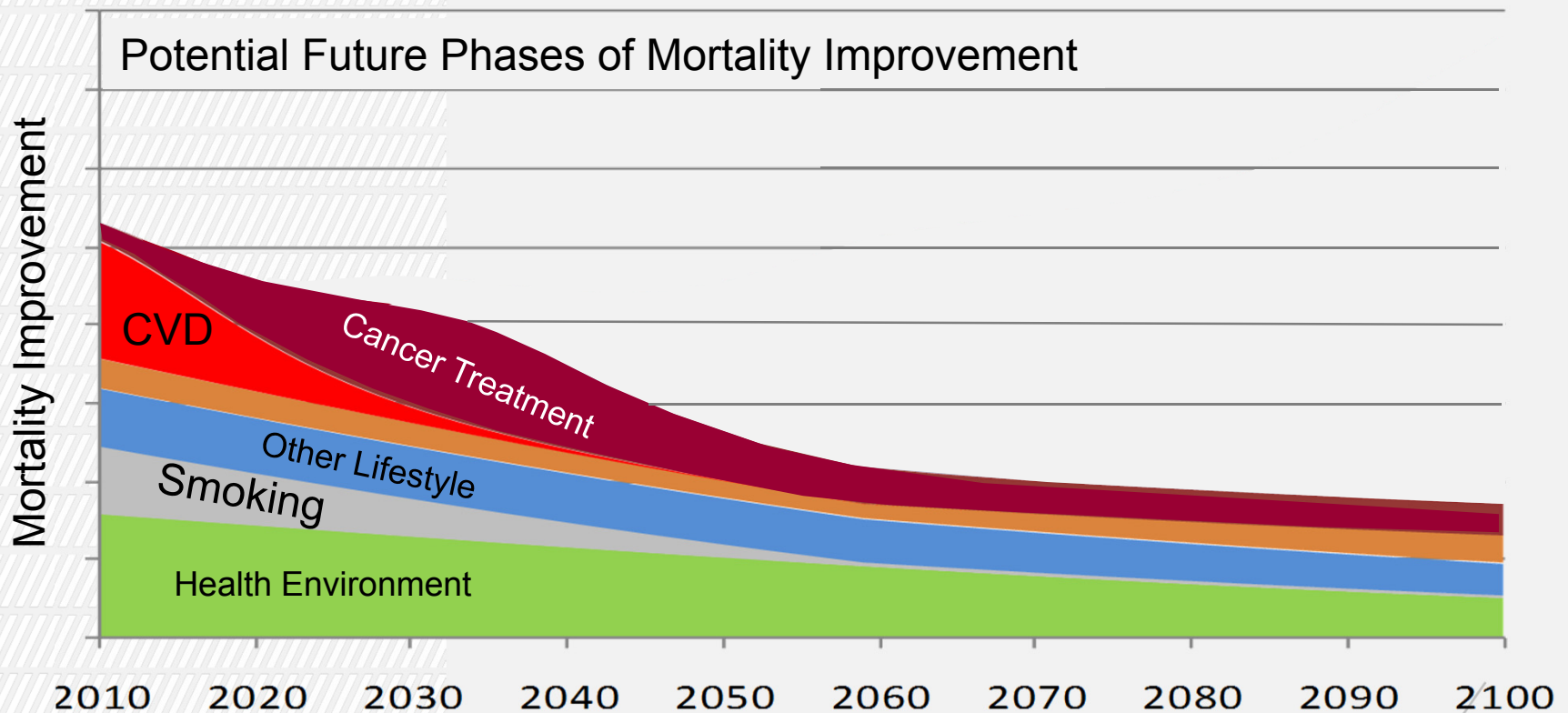
All other vitagions are maintained at their median trajectories

Current vitagions give results close to current actuarial assumptions

Long Term Rate of Mortality Improvement

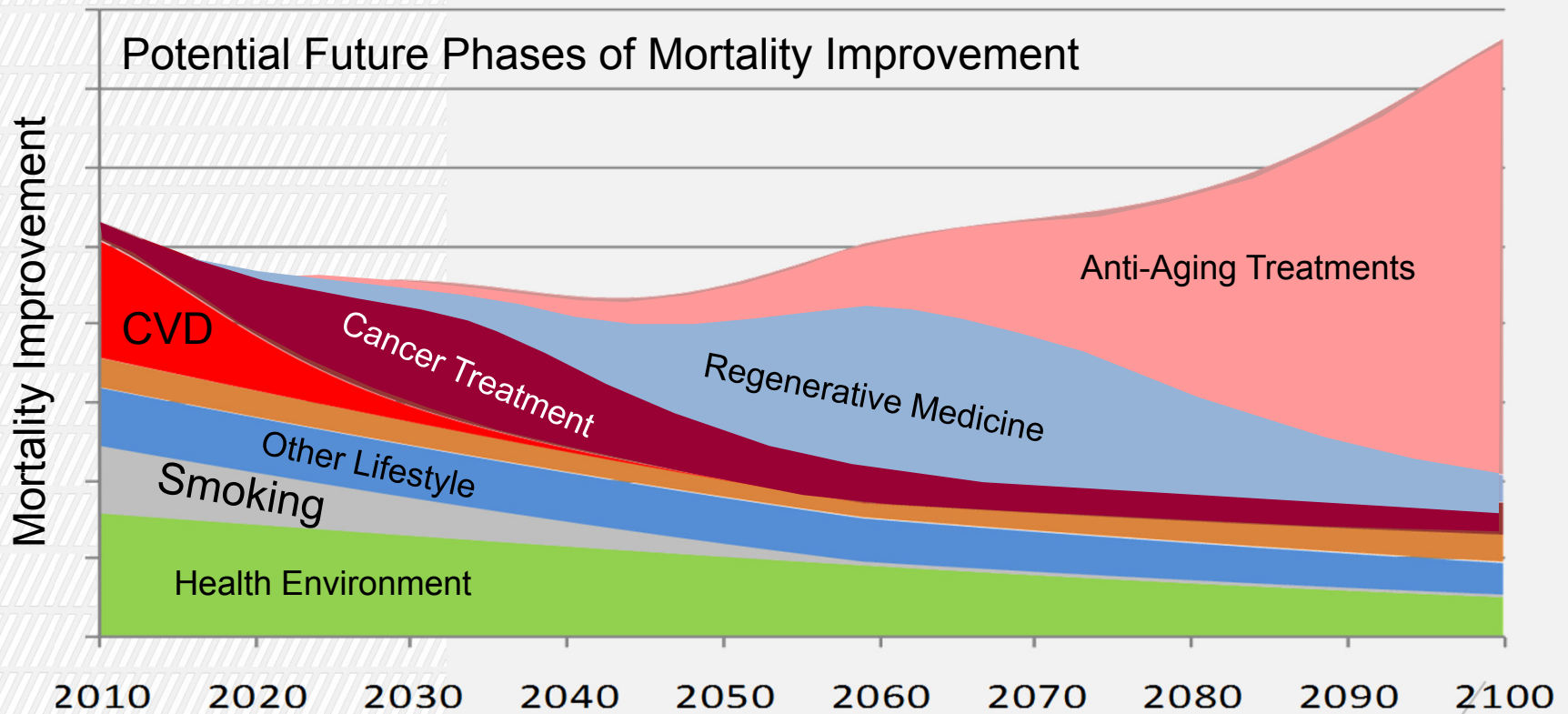
UK actuarial benchmark = 1.5%

RMS rate for current Vitagions = 1.7%



Adding future Vitagions increases the long-term rate of improvement

Long-term rate = 2%

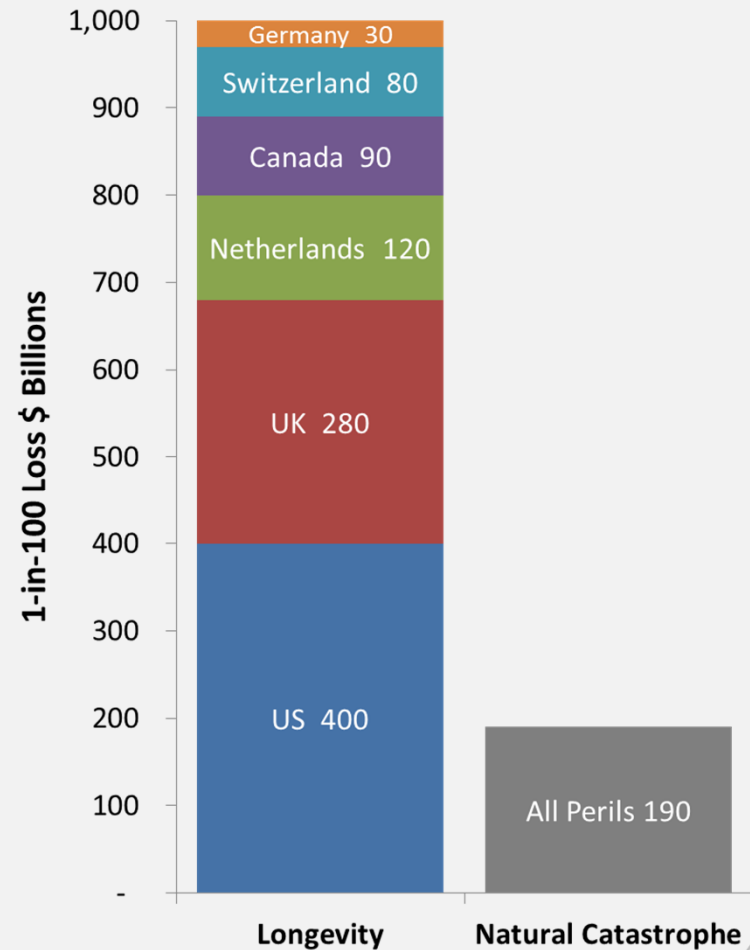


What if an extreme scenario of mortality improvement occurs?

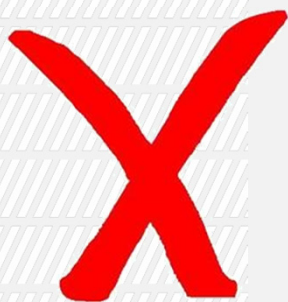
1-in-100

+ 5 Years of LE

\$1 Trillion



Where Should Longevity Risk live?



## **Pension Plans**

Concentrated risk – no natural offset

Managed by human resources professionals



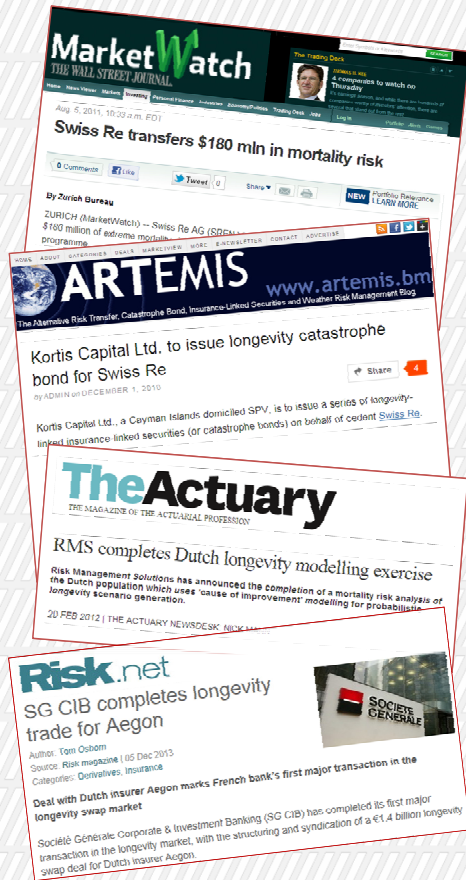
## **Life Insurers**

Offset against life insurance

Managed by risk professionals

# The market is coming around to our view

- Capital markets transactions are occurring using the RMS view of risk
- European insurers integrating our views into their risk management
- Large US insurers benchmarking risk capital decisions with our view








**THE RECIPE FOR A TRANSACTION  
MAKING MARKETS WORK FOR INSURANCE AND PENSIONS RISK**

**Pretty Sagoo  
European Insurance Group Solutions, Deutsche  
Bank**

# The recipe for a transaction

	<b>Ingredients</b>	Market Participants (focusing on banks and investors)
	<b>Preparation</b>	Motivations for entering into a transaction Due Diligence
	<b>Cooking Times</b>	Time to Execution



# Ingredients: The role of banks

- Risk Syndication

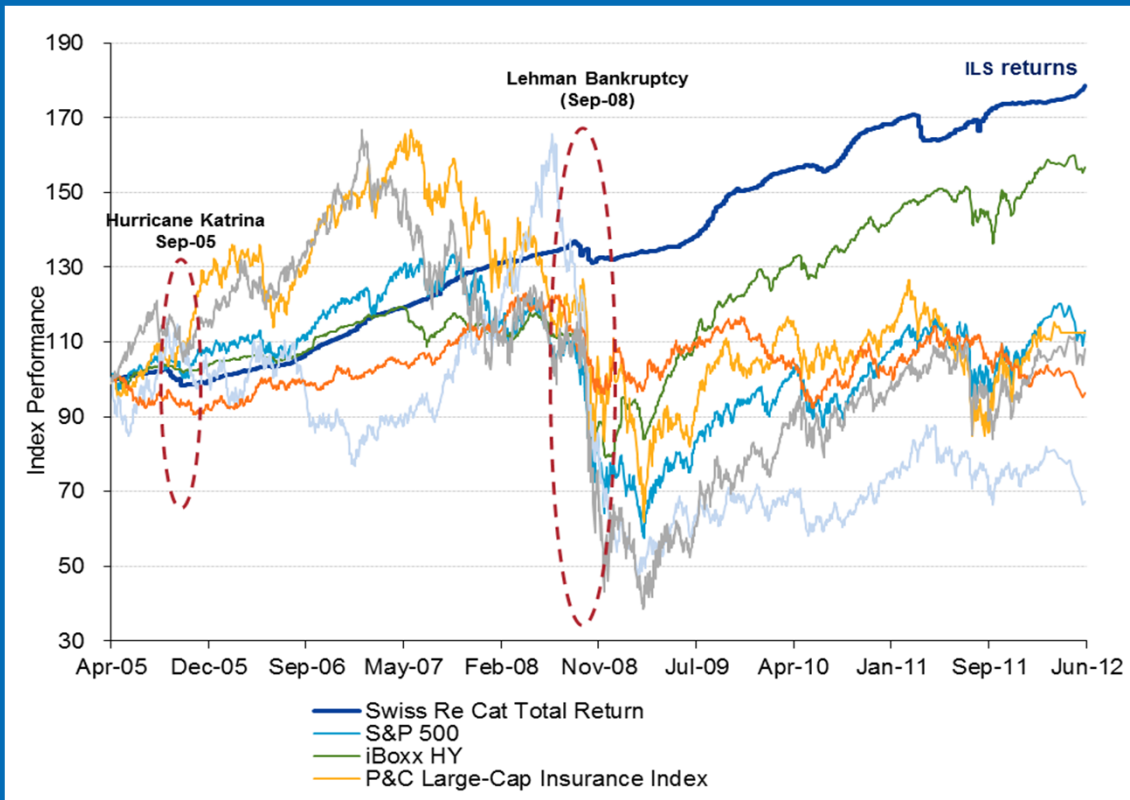


- Liquidity
- Market Making
- Investor education
- Apply existing markets technology to managing insurance risk



# Ingredients: The role of investors as risk takers

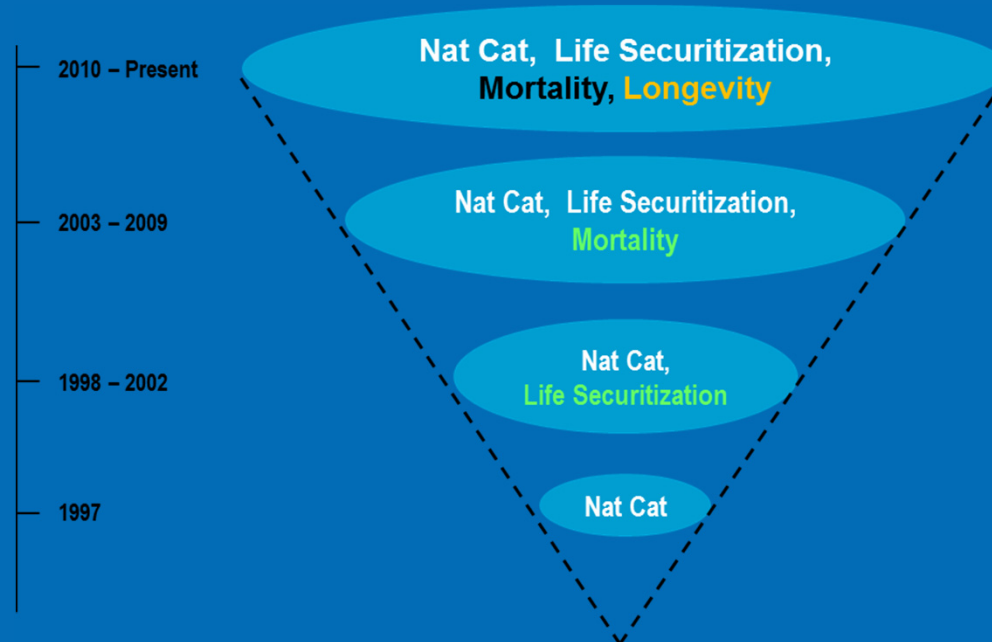
## Why Insurance Risk as an asset class?



Note:  
 1. All indices are scaled to 100 as of April 1, 2005  
 2. Swiss Re TR Cat Bond Performance Index tracks the total return for all outstanding US\$ denominated cat bonds, as available on Bloomberg  
 3. The iBOXX HY US\$ TR Index contains the 50 most liquid sub-investment grade US\$ denominated bonds issued by corporate issuers  
 4. P&C Large-Cap Insurance Index is custom composite of USD stock prices of ACE, Allianz, Chubb, Munich Re, Swiss Re, Travelers and Zurich; index constituents are equally-weighted  
 Source: Deutsche Bank, Bloomberg

# Ingredients: Focusing on Longevity

- There are some key differences between existing ILS investments versus insurance risk from longevity
- Longevity risk is long-dated and linked to trends in mortality improvements



# Ingredients: The challenges to placing longevity risk....

The challenge is to match investors needs with hedgers needs

Investors prefer:

- Loss Limiting
- Shorter dated than traditional reinsurance (10-20 years) via commutation mechanism
- Linked to population mortality Indices (ONS, CBS, Statistisches Bundesamt , LLMA...)
- Inflation escalation / other risks excluded
- Transacted as a Derivative under ISDA or (re)insurance contract

**=> Difficult to place annuity/pensions risk with investors;  
but works if risks is appropriately structured**



# **Ingredients: Challenges to an active market for longevity risk transfer**

- Lack of standardization and transparency
- Poor knowledge of longevity risk and lack of consensus on future trends
- Long-term risk
- Lack of liquidity



# Preparation

## What are the motivations for a transaction?

<b>Originating Party (Re)Insurer / Pension</b>	<b>Intermediary Bank</b>	<b>Risk Taker (Re)Insurer / Investor</b>
Re(Insurance) Capital	Bank Capital	Absolute Return
Risk	Return on Capital	Risk
Strategy	Strategy	Diversification
Ratings	Risk	Capital Lock Up (Term)
Cost of Capital	$CVA > RWA$	





# Cooking Times....

Indemnity Pensions Transaction

6-24m+

Capital Markets Risk Transactions

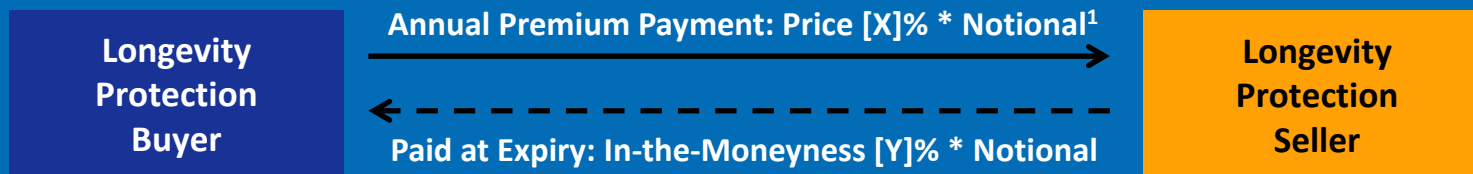
3-8m (LEO – shorter....)



# Longevity Experience Option (LEO)

LEO launched to break the mould:

- Familiarity
- Liquidity
- Pricing
- A liquid, standardised, longevity derivative
- Using third party risk analysis (From RMS and Miliman)



# Illustrative LEO Transaction..continued

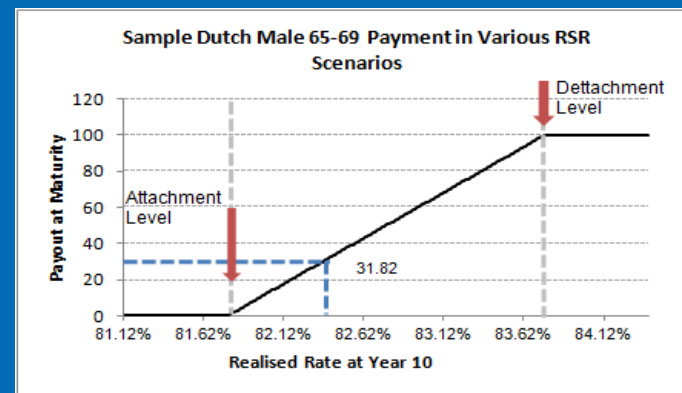
Cohort	Country	Exposure Start Year <sup>1</sup>	RSR (10y) Attachment Level	RSR (10y) Detachment Level
65-69 Male	NL	2013	81.77%	83.75%

## Sample Transaction Cashflows at Maturity

- **At Maturity:**
  - The Investor makes a floating rate payment to DB based on the Realised Survival Rate at Year 10

Floating Payment in various scenarios	
RSR <sub>10</sub>	Floating Payment
82.40%	= €100 * MIN(1, MAX(0, (82.40% - 81.77%) / (83.75% - 81.77%))) = €31.82
81.77%	€0
83.75%	€100

## Payoff Diagram



Please Note: Projections are based on a number of assumptions as to market conditions. There can be no guarantee that the projected results will be achieved.

1. Exposure Start Year means the first set of data that will be used in calculation of the RSR will be for males aged 65-69 in 2013.

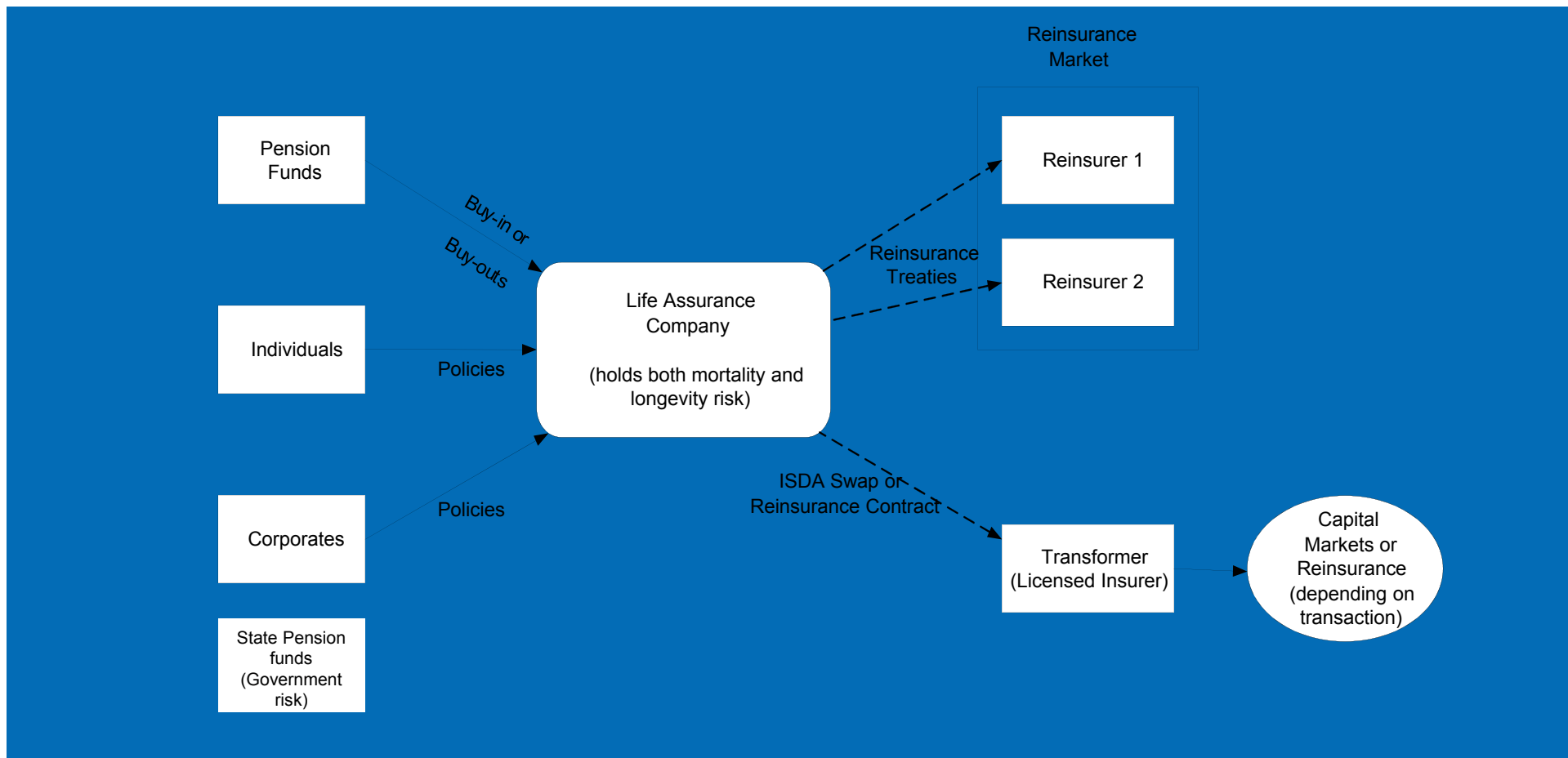
# **LEGAL ISSUES**

**Jennifer Donohue  
Partner, Insurance, Reinsurance  
and Capital Markets**

**CADWALADER WICKERSHAM & TAFT LLP**

# The Longevity Market

## Where is the risk?



# What is insurance?

- **Concept**

Transfer of risk from someone who is not able or who does not want to bear it (the insured)  
To someone who is able and does want to bear it (the insurer)

- ***Prudential Insurance Co v IRC [1904] 2KB 658***

- Any enforceable contract under which the insurer undertakes:

- in consideration of one or more payments;
- to pay money or provide a corresponding benefit to an insured;
- in response to a defined event the occurrence of which is uncertain (either as to when it will occur or as to whether it will occur at all), and
- adverse to the interests of the insured.

- ***Gould v Curtis [1913] 3 KB 84***

- Even though attaining a given age or surviving for a stated period of years may not be adverse, a contract to pay out in that event may still be insurance

- ***Fuji Finance Inc v Aetna Life Insurance Co. Ltd [1997] Ch 173***

- The form of a contract is relevant but not decisive as to whether a contract is a contract for insurance. The contract must be characterised as a whole and not according to its “dominant purpose” or the relative weight of its “insurance content”.

- ***ReDigital Satellite Warranty Cover Ltd [2011] EWHC 122 (Ch)*** and ***Sibthorpe v Southwark LBC [2011] EWCA Civ 25*** both cited ***Fuji Finance Inc v Aetna Life Insurance Co. Ltd*** and the ratio applied

- **FCA Handbook - PERG 6**

# What is special about insurance?

- Special legal rules, including
  - The duty of good faith
    - A contract of .. insurance is a contract based upon the utmost good faith, and, if the utmost good faith be not observed by either party, the contract may be avoided by the other party MIA 1906 s 17
  - The duty of full disclosure
    - The assured must disclose to the insurer all facts material to an insurer's appraisal of the risk which are known or deemed to be known by the assured but neither known or deemed to be known by the insurer If non-disclosure induces the making of the contract on the relevant terms, the insurer may avoid the contract.
- Regulation of insurance-related activities
- Effecting and carrying out contracts of Insurance Assisting in the administration and performance of a contract of insurance are (in general) 'Regulated Activities' for the purposes of the Financial Services and Markets Act 2000 RAO Arts 10—13 , 39A-39C and 75, and Schedule 1
- A criminal offence for anyone but an authorised person to carry on these activities in the UK FSMA s 19
- Sections 26 and 27 FSMA 2000 makes agreements in respect of authorised activity made with or through unauthorised persons unenforceable.
- INSPRU 1.15.13
- Insurers can (in general) only carry on insurance business:
  - A firm other than a pure reinsurer must not carry on any commercial business other than insurance business and activities directly arising from that business.
  - A pure reinsurer must not carry on any business other than the business of reinsurance and relation operations (FCA Handbook)

# Further Distinctions Insurable Interest

- **Common Law**
  - The law requires that a person who contracts insurance has an insurable interest in the subject-matter insured
- **Life Assurance Act 1774**
  - No insurance shall be made by any person or persons, bodies politick or corporate on the life or lives of any person, or persons, or on any other event or events whatsoever wherein the person or persons for whose use, benefit, or on whose account such policy or policies shall be made, shall have no interest, or by way of gaming or wagering and every assurance made contrary to the true intent and meaning hereof shall be null and void to all intents and purposes whatsoever
  - And it shall not be lawful to make any policy or policies on the life or lives of any person or persons, or other event or events, without inserting in such policy or policies the person or persons name or names interested therein, or for whose use, benefit, or on whose account such policy is so made or underwrote
  - And in all cases where the insured hath interest in such life or lives, event or events, no greater sum shall be recovered or received from the insurer or insurers than the amount of value of the interest of the insured in such life or lives, or other event or events.
- **Gambling Act 2005**
  - S 335. The fact that a contract relates to gambling shall not prevent its enforcement.
  - Without prejudice to any rule of law preventing the enforcement of a contract on the grounds of unlawfulness (other than a rule relating specifically to gambling).
  - S 10 excludes from the definition of a “bet” (and so from the definition of “gaming”)
  - Any bet whose making or acceptance is a regulated activity under FSMA 2000



# The Transformer

- What is a Transformer?

- A special purpose vehicle that “transforms” insurance into an investment offering to the capital markets or vice versa.
- Usually an off-shore cell vehicle or ISPV, regulated and licensed to carry on insurance business.
- Can write traditional reinsurance, as well as convert the longevity exposure in a reinsurance contract to a form that is more palatable to the capital markets.
  - A firm other than a pure reinsurer must not carry on any commercial business other than insurance business and activities directly arising from that business. A pure reinsurer must not carry on any business other than the business of reinsurance and related operations INSPRU 1.5.13
  - Sections 143-148 Solvency II Delegated Acts 2014.
  - FCA Handbook

- How does the alchemy happen?

- Allows an insurer/pension fund to transfer pure longevity risk (using a swap) that can be reinsured in the traditional insurance markets.
  - NOTE: The risk has not be transferred to the capital markets
- Allows a reinsurer to cede (via a reinsurance contract) specific policies to the transformer cell, allowing this particular group of policies to be hedged for longevity.

# Why are transformers attractive?

- Authorised to write re-insurance
- No risk of contagion as the cell only holds insurance risk that is transferred into to it and writes no new business.
- Policies being transferred to the vehicle can be cherry picked.
  - E.g.: Only policies of annuitants aged 80 and above could be transferred in. When this is hedged with a longevity swap a 10 year swap should capture a large portion of the longevity risk. 10 year risk is much more palatable to capital markets investors.
- *Offers insurers regulatory capital relief.*
- Capital markets do not have to take on insurer solvency and credit risk. Transformer is fully capitalised.
- Cell structure means that each cell can be individually tailored according to the needs of the transaction.

# Dealing with Longevity Risk

- Reinsurance:
  - Counterparties must be licensed and regulated.
  - Transfer involves not just longevity risk.
  - Ceding insurer with a regulatory capital benefit as liabilities are moved off balance sheet.
  - Longevity risk has NOT been transferred to the capital markets.
- Longevity Swap:
  - A contract for differences documented under an ISDA Master Agreement.
  - Counterparty does not have to be regulated.
    - NOTE: These possess several of the characteristics of Insurance. Must be carefully documented.
    - Recharacterisation risk as insurance may:
      - Means that the person writing the contract has inadvertently committed a criminal offence or a regulatory infraction (by carrying on insurance business in the UK without permission from the FSA)
      - Affect the enforceability of the contract (eg because the duty of disclosure has not been performed)
      - Impose a duty of utmost good faith on the parties
  - Serves to hedge longevity risk as previously discussed.
  - Regulatory capital benefit not as extensive as under a reinsurance contract
  - Needs to be marked-to-market.
  - Originally not much appetite for such swaps with traditional capital markets participants as longevity risk lies in the tail i.e. the swap would have to long-dated. This has changed with “reset” or commutation mechanisms.

# Other Considerations

## EMIR

- Article 4 – certain counterparty to OTC to clear eligible contracts – to be decided.
- Article 9 – 12<sup>th</sup> February requirement to report derivative contracts
- Article 11 – Trade confirmation and collateral

## DODD FRANK

- Safe Harbour for ILS BUT wider discussion regarding ILS issuers are commodity pools and therefore should be CFTC registered.

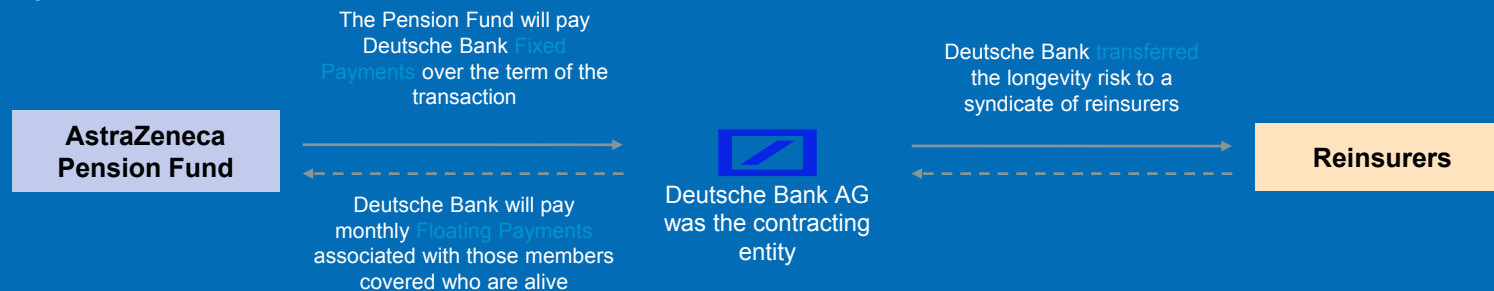
## OTHER DEVELOPMENTS

- Solvency II
- Omnibus 2. January 2016.

# Case Study: £2.5bn Longevity Swap with AstraZeneca

## Transaction Overview

- In December 2013, Deutsche Bank structured and executed a transaction to hedge the longevity risk for pensioner liabilities of the AstraZeneca Pension Fund. The fund is sponsored by AstraZeneca plc, who specialise in pharmaceutical and medical products.
- The transaction protects the pension scheme against the longevity risk of c 10,000 current pensioners and contingent dependants, covering some £2.5bn of liabilities



## Client Rationale

- Defined benefit pension funds have an obligation to pay a pension throughout each member's life, and often to a dependant on the member's death. Thus, funds have a large exposure to increasing lifespans – "longevity risk".

By hedging this risk Deutsche Bank say:

- It almost entirely removes longevity exposure in respect of lives covered
- Reduces volatility of the cash cost of the pension scheme, also benefiting the sponsor (AstraZeneca plc)
- Enhances the security of pensioner's benefits
- Generally well-received by the market

# Analysis of Transactions

## Transaction Overview

- In December 2013, Deutsche Bank structured and executed a transaction to hedge the longevity risk for 5 of the company's defined benefit pension schemes. The funds are all sponsored by Carillion plc, who provide support and construction services.
- The transaction protects the pension scheme against the longevity risk of 9,000 current pensions and contingent dependants, covering some £1 bn of liabilities.
- This was a complex trade encompassing 5 of the pension funds under the same sponsor. The five schemes were priced as a single block of business but executed as five separate derivative contracts (Deutsche Bank AG was the contracting entity). The rationale of Deutsche Bank was that this resulted in reduced costs but kept the flexibility and characteristics of individual contracts.

## Client Rationale according to Deutsche Bank

- The swap hedges the schemes' longevity exposure in respect of lives covered
- It reduces volatility of the cash cost of the pension scheme, also benefiting the sponsor (Carillion plc)
- It enhances the security of pensions' benefits
- This type of hedge is generally well-received by the market
- The sponsoring company can demonstrate to the market that pension liabilities are being de-risked and execution occurred under tight client timeframes. There was also no immediate cash impact to the company.

