

# Health and a Three-Dimensional Longevity Dividend

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Target Healthy Life Expectancy

Focus on 50-65 employment



Health



# Historical comparisons

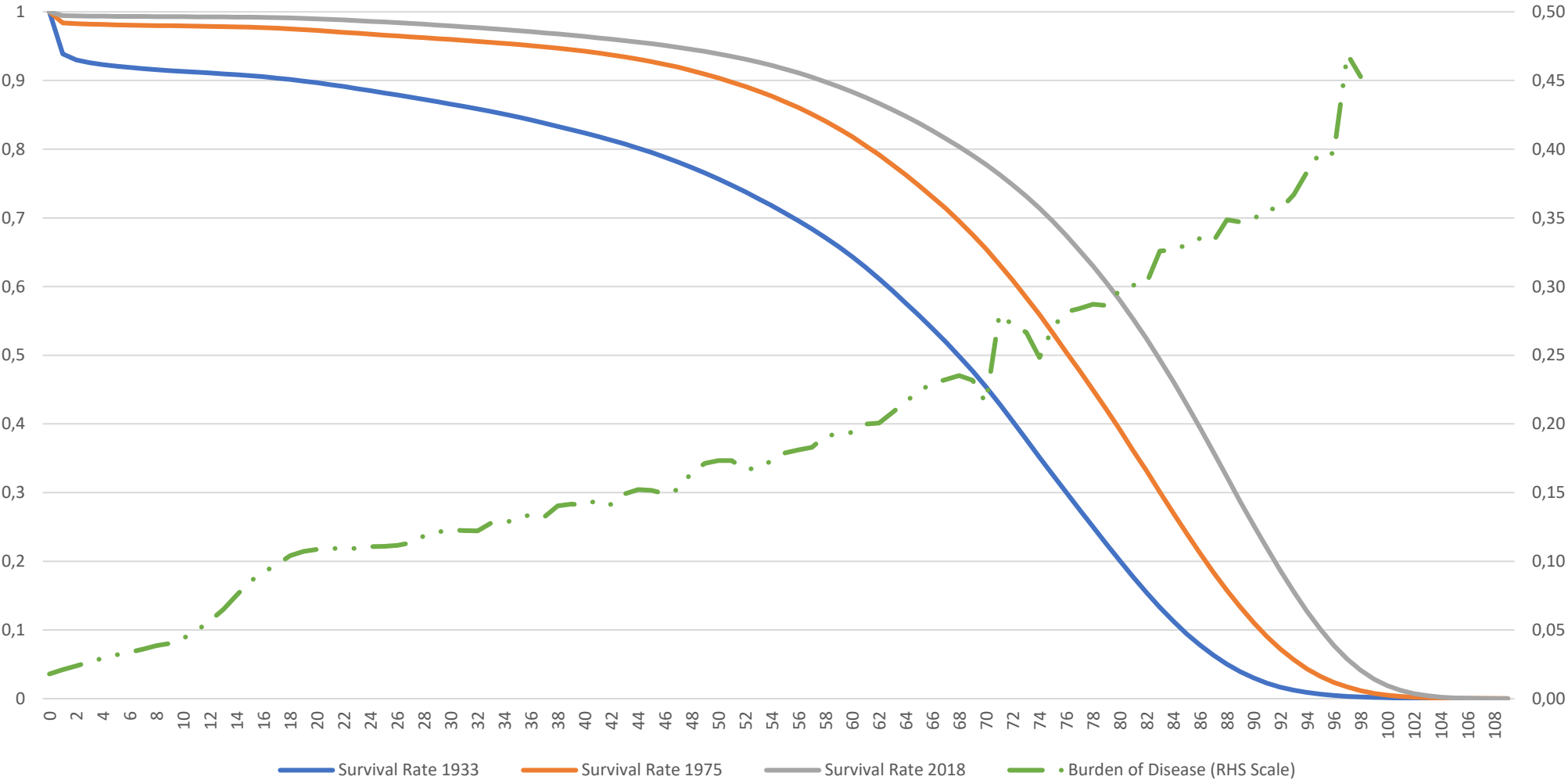
Value of historical increases in GDP and longevity per person (thousands of US dollars)

Country	GDP growth per capita			GDP + longevity gains per capita		
	1990-1999	1999-2009	2009-2018	1990-1999	1999-2009	2009-2018
Australia	7.5	9.3	5.9	32.9	35.5	16.3
Canada	4.6	7.7	4.9	10.3	26.9	5.7
France	4.3	2.8	3.1	19.2	24.6	14.2
Germany	4.2	2.7	5.9	26.2	20.6	9.9
Israel	9.3	3.9	6.7	15.9	23.1	17.3
Italy	3.9	-0.3	0.4	23.7	21.5	8.0
Japan	2.2	1.0	4.6	19.2	16.7	16.7
Netherlands	8.0	4.9	4.1	16.7	35.0	7.4
New Zealand	5.1	5.0	8.3	27.3	29.5	10.4
Spain	3.9	2.8	2.4	16.0	18.6	8.0
Sweden	4.7	6.6	7.4	21.1	27.2	19.0
UK	6.2	3.8	5.5	22.3	33.4	7.2
USA	8.8	4.5	8.0	23.1	21.3	-6.2

Source : Scott, Ashwin, Ellison and Sinclair "International Gains to Achieving Healthy Longevity", Cold Spring Harbour (2023)

Welfare gains from better health and life expectancy are slowing down – things aren't working like they used to

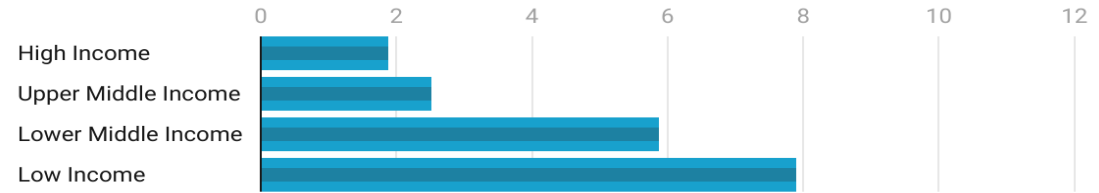
# U.S Survival Rates and Disease Burden by Age



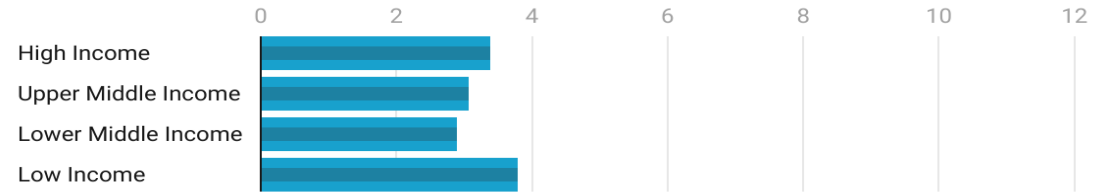
Around the world  
the biggest lifetime  
disease challenge  
everyone faces are  
now ageing-related

## Lifetime Disease Burden(Expected DALYs Lost)

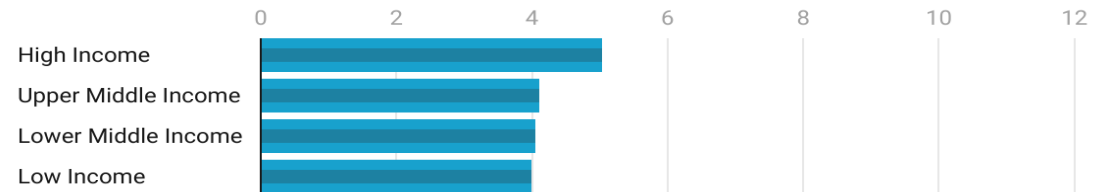
### Infant



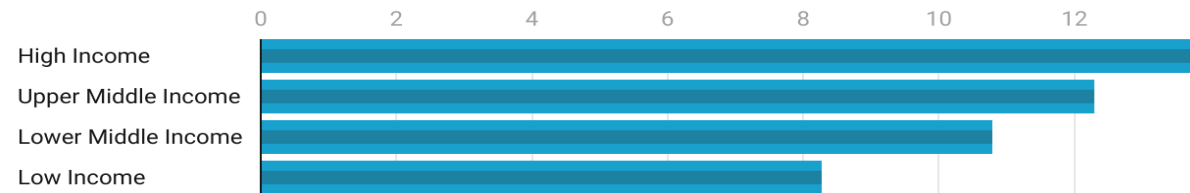
### Adult (early)



### Adult (late)



### Ageing-related





# Importance of targeting ageing itself

Impacts numerous diseases at once

Leads to big improvements not just in quantity but quality of life

Need to stop drawing a distinction between health and ageing

Recognise that ageing is no more 'natural' than numerous diseases that have been eliminated as a common risk

Watch out for progress in geroscience and gerotherapeutics

# Four ways of Ageing Better



**Dorian Gray** – Shift H,  
Constant S

**Struldbrugg** – Shift S,  
constant H

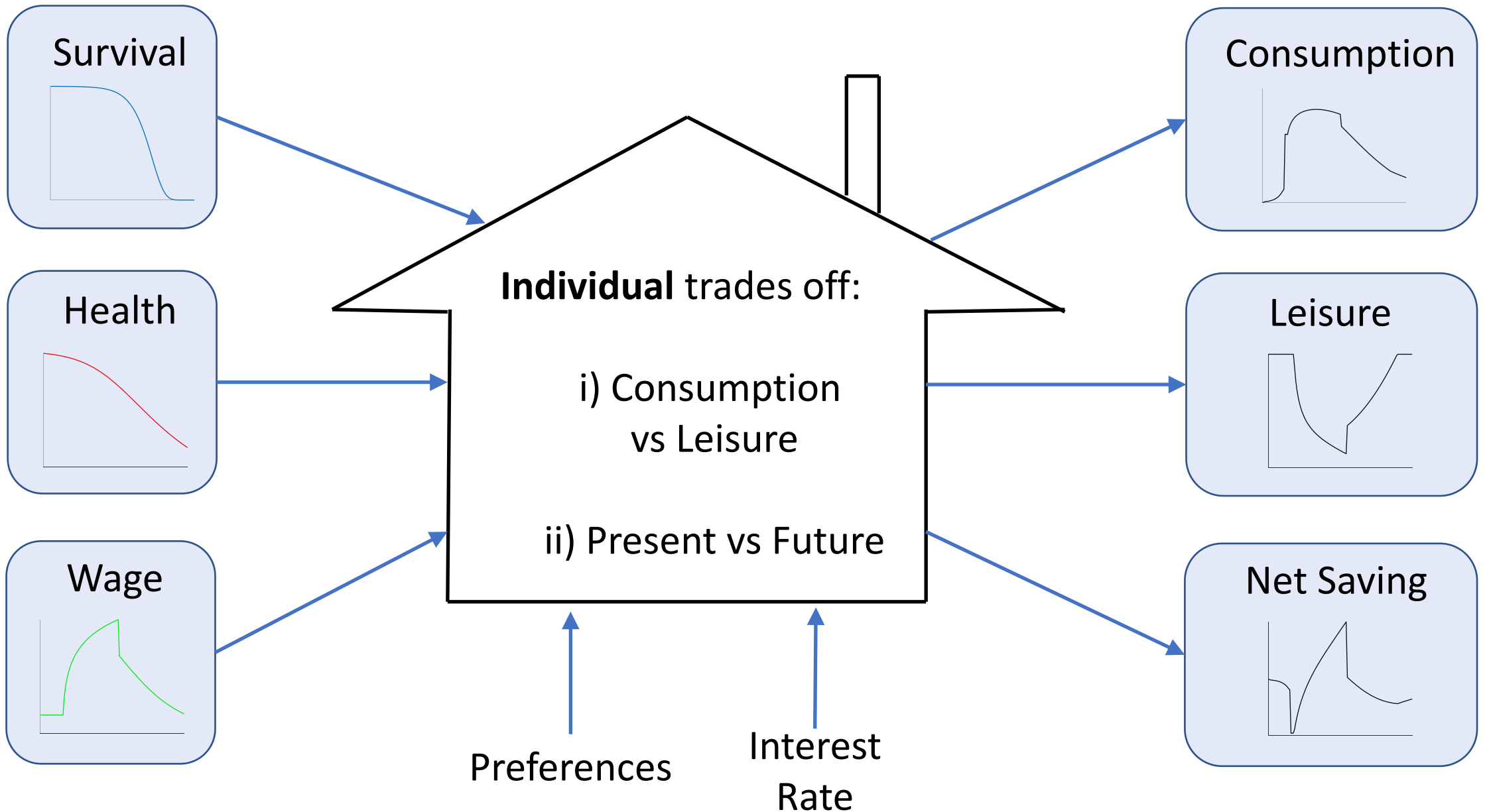


**Peter Pan** – Slow  
down S and H  
decline



**Wolverine** – Reverse S and H

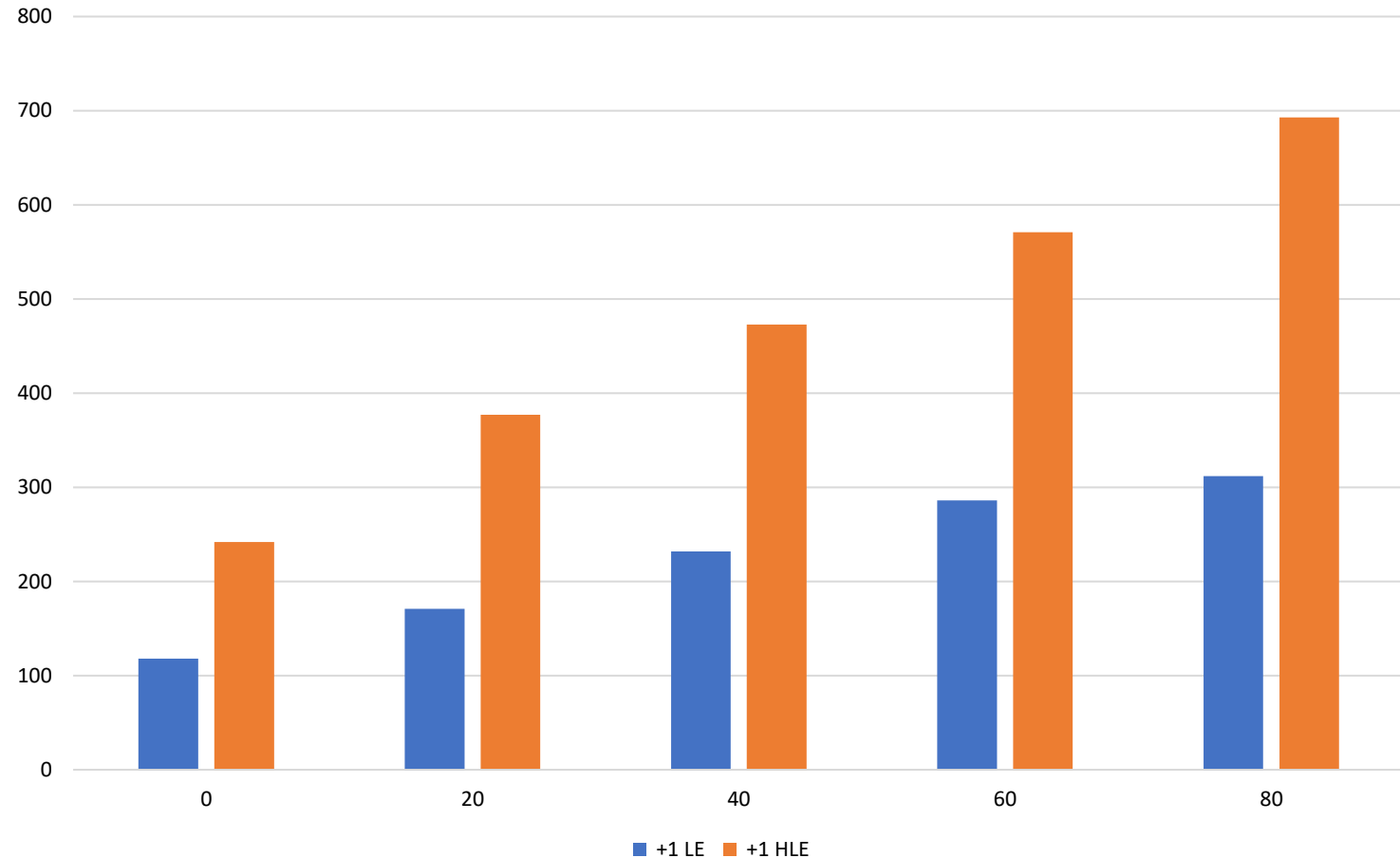
# VSL model based on Murphy and Topel (2006) JPE





- The value of gains to life expectancy even with declining health are substantial – more time is good
- But if gains to life are spent in deteriorating health the value of extra years of life are diminishing
- Much more valuable is to improve health relative to life expectancy
- More valuable to ensure healthspan equals lifespan than to seek further gains to life expectancy

# How Much is One More Year of Life Expectancy vs One More Year of Healthy Life Expectancy Worth to average US citizen at Different Ages? \$000s



Source : Scott, Ellison, Sinclair (2021) "The Economic Value of Targeting Aging", *Nature Aging*

BIG

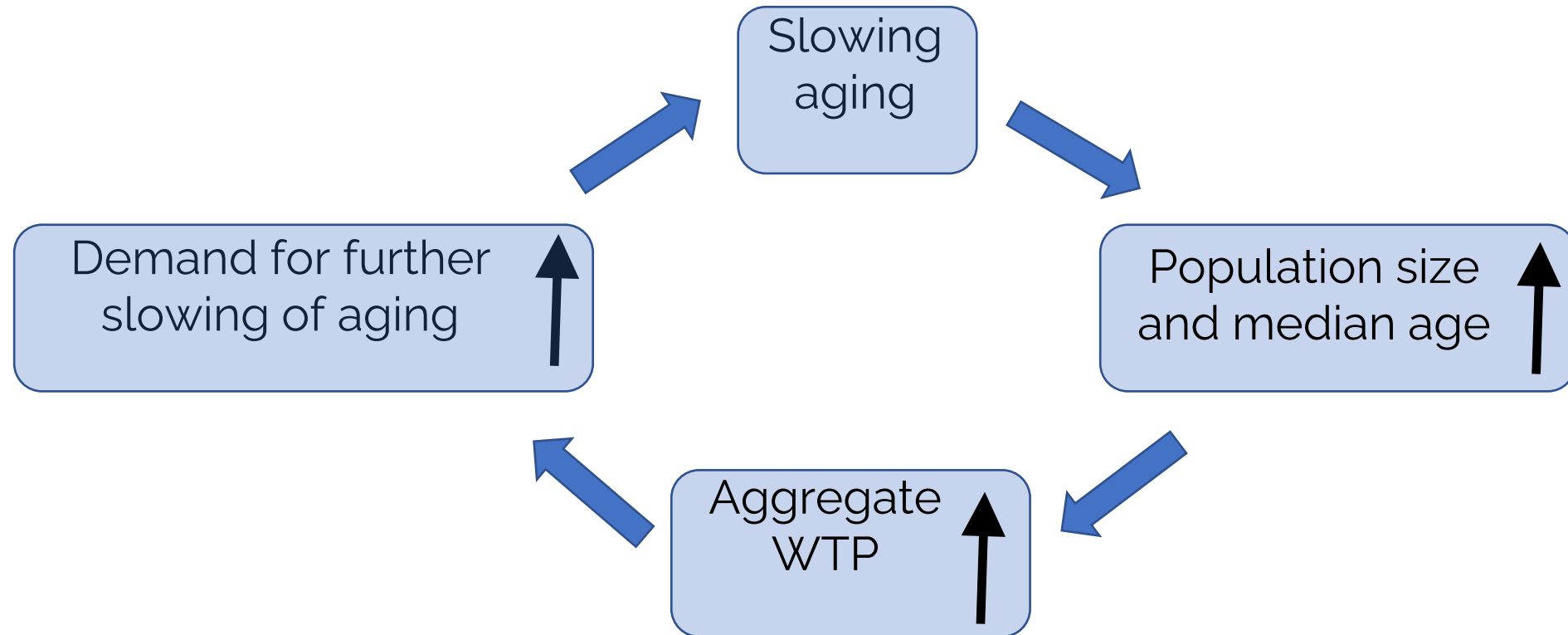


	Life Expectancy	Healthy life Expectancy	Population (mns)	GDP per Capita (\$000s)	WTP Current (\$trn)	WTP Future Gen (\$trn)	WTP Total (\$trn)
Australia	83	70.9	25.5	47	2.2	0.7	2.9
Canada	82.2	71.3	37.74	43.4	3.1	0.9	4
France	82.5	72.1	65.27	40.9	5	1.2	6.2
Germany	81.7	70.9	83.78	47.1	7.6	1.6	9.2
Israel	82.6	72.4	8.66	38.6	0.6	0.3	0.9
Italy	83	71.9	60.46	35.1	4.1	0.6	4.7
Japan	84.3	74.1	126.48	40.4	9.5	1.3	10.8
Netherlands	81.8	71.4	17.13	52.4	1.7	0.4	2.1
New Zealand	82	70.2	4.82	40.6	0.4	0.1	0.5
Spain	83.2	72.1	46.75	34.2	3.1	0.5	3.6
Sweden	82.4	71.9	10.1	50	1	0.3	1.3
UK	81.4	70.1	67.89	39.1	5.1	1.4	6.5
USA	78.5	66.1	331	58.2	38.4	12.5	50.9

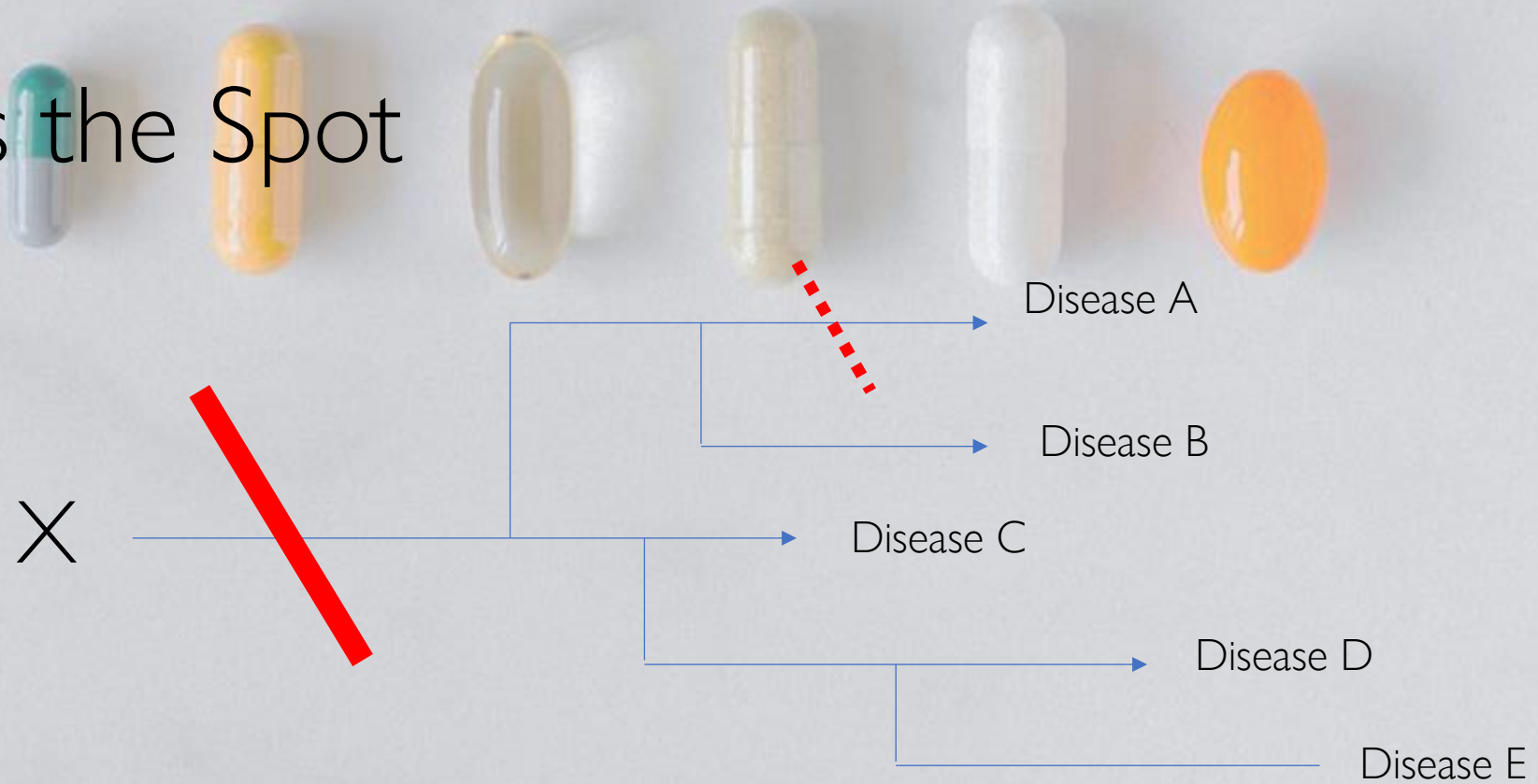
# Why are Gains Now so Large?

- Increases in life expectancy
- More older people
- Competing Risks
- It will just get larger and larger

# Virtuous circle



# X Marks the Spot



What is your favourite candidate for X – Ageing? Rapamycin? GLP-1's? Exercise? Education? Income?

We need a measure of health to focus allocating health resources and drug development

# Profound Change in Health System

- Prevention not intervention
- Outside current health system
- Blend ageing and health together
- Shift from disease model to focus on ageing and geroscience
- Barriers to change
- Won't spend less money – spend the same or even more but to keep us well not to treat us while we ill

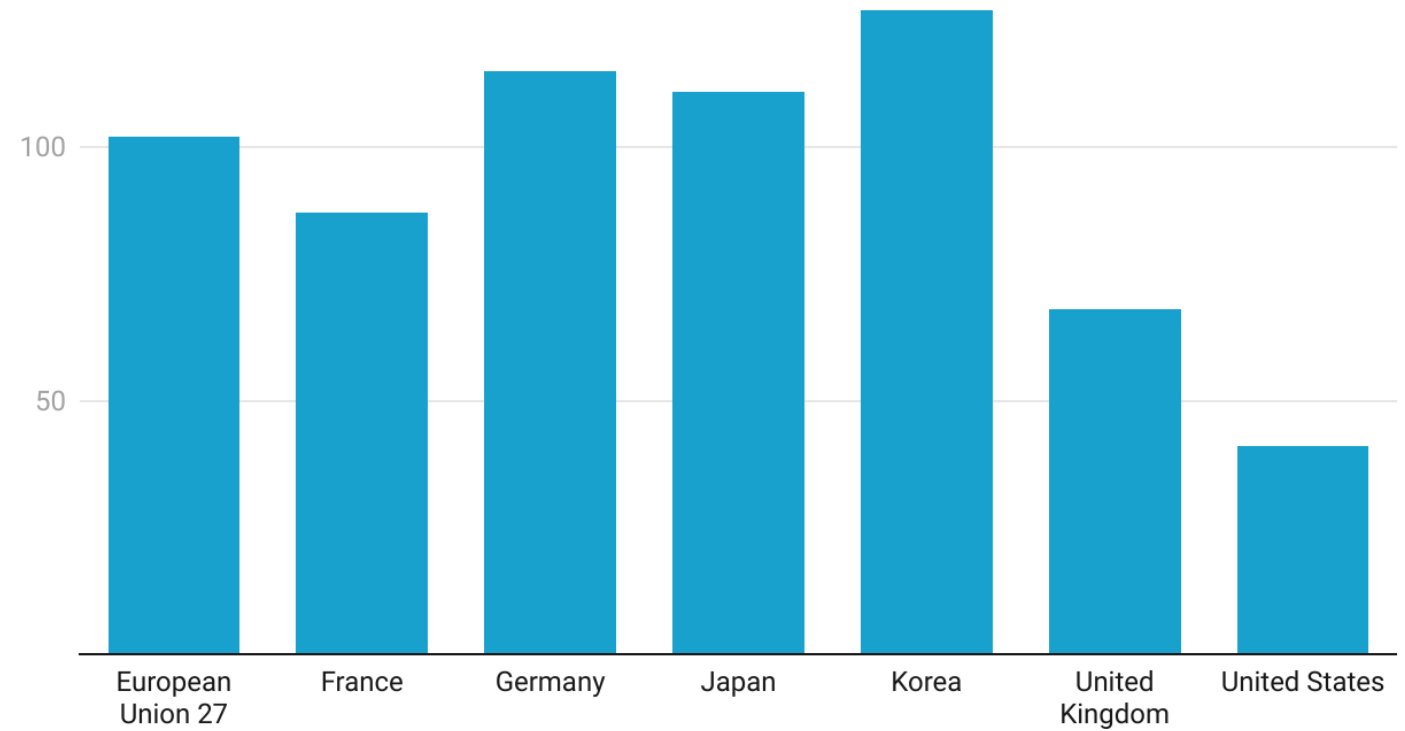


# The Macroeconomic Case



Main driver of  
employment/GDP  
last ten years – older  
workers

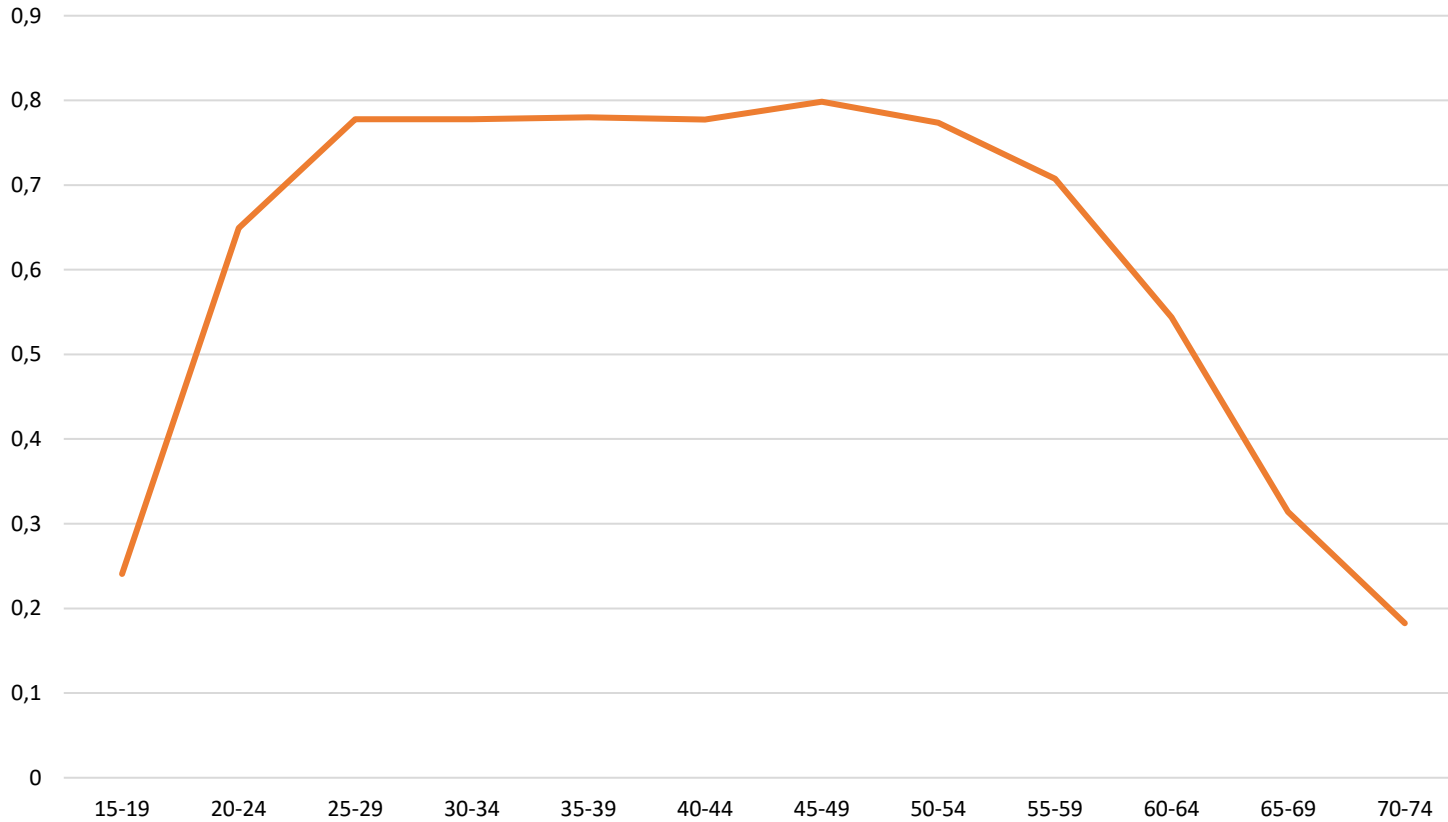
## Employment Growth (%) due to workers 50+



Created with Datawrapper

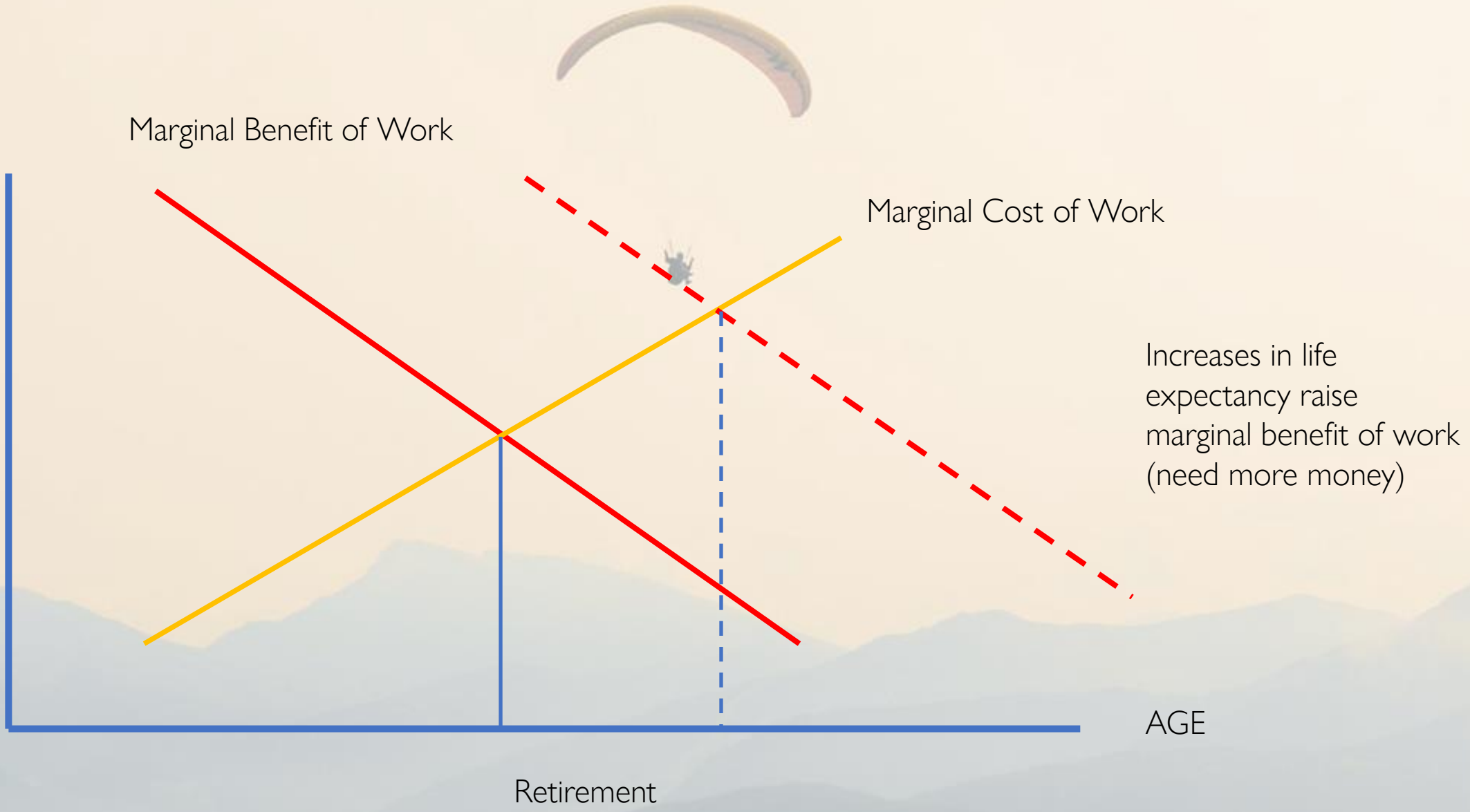
# Boosting Employment from Age 50 to State Pension Age is a key priority

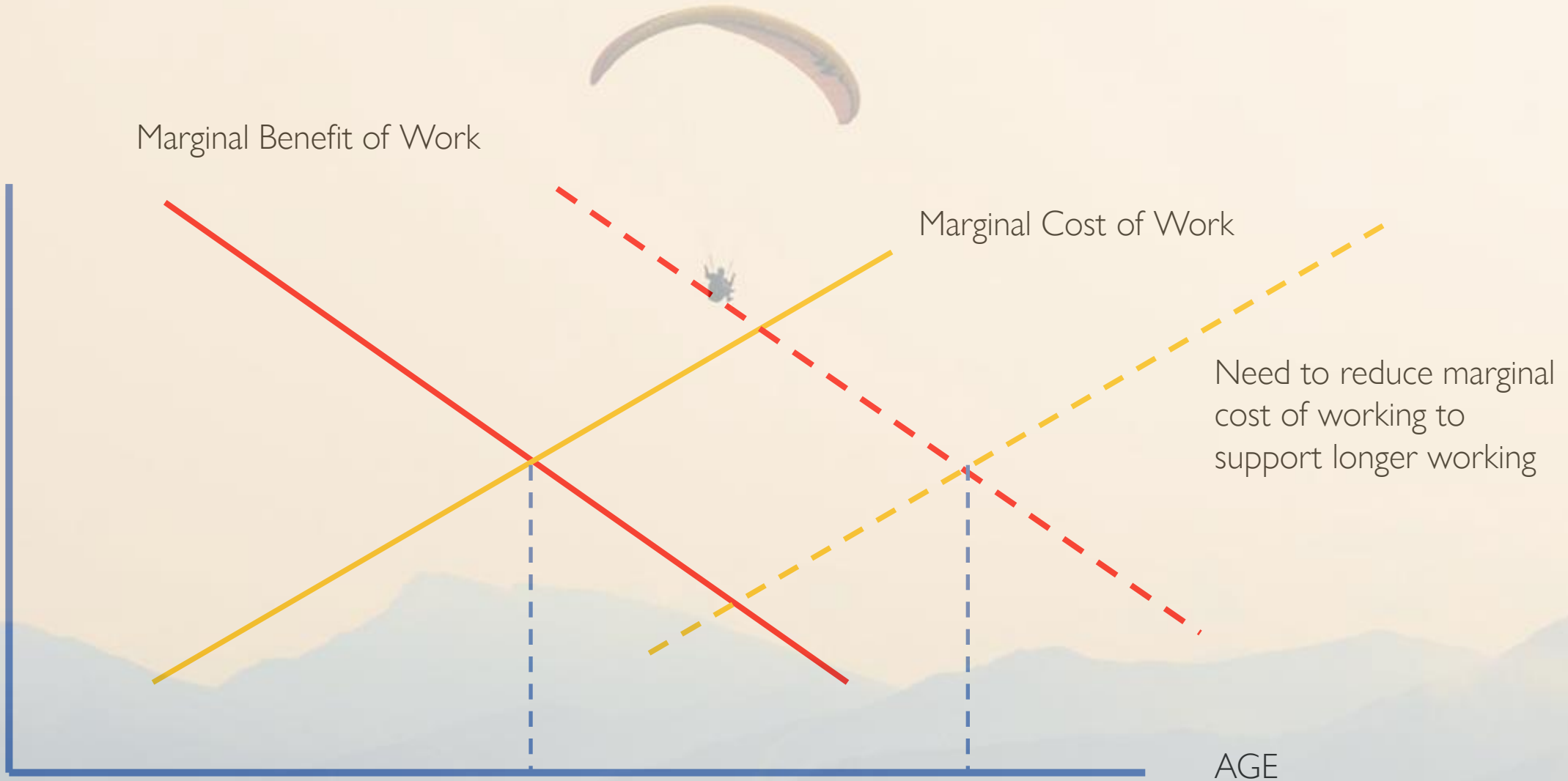
## U.S Employment/Population 2020



### Why do people withdraw?

- Health
- Caring
- Age Friendly jobs
- Skills
- Age Discrimination

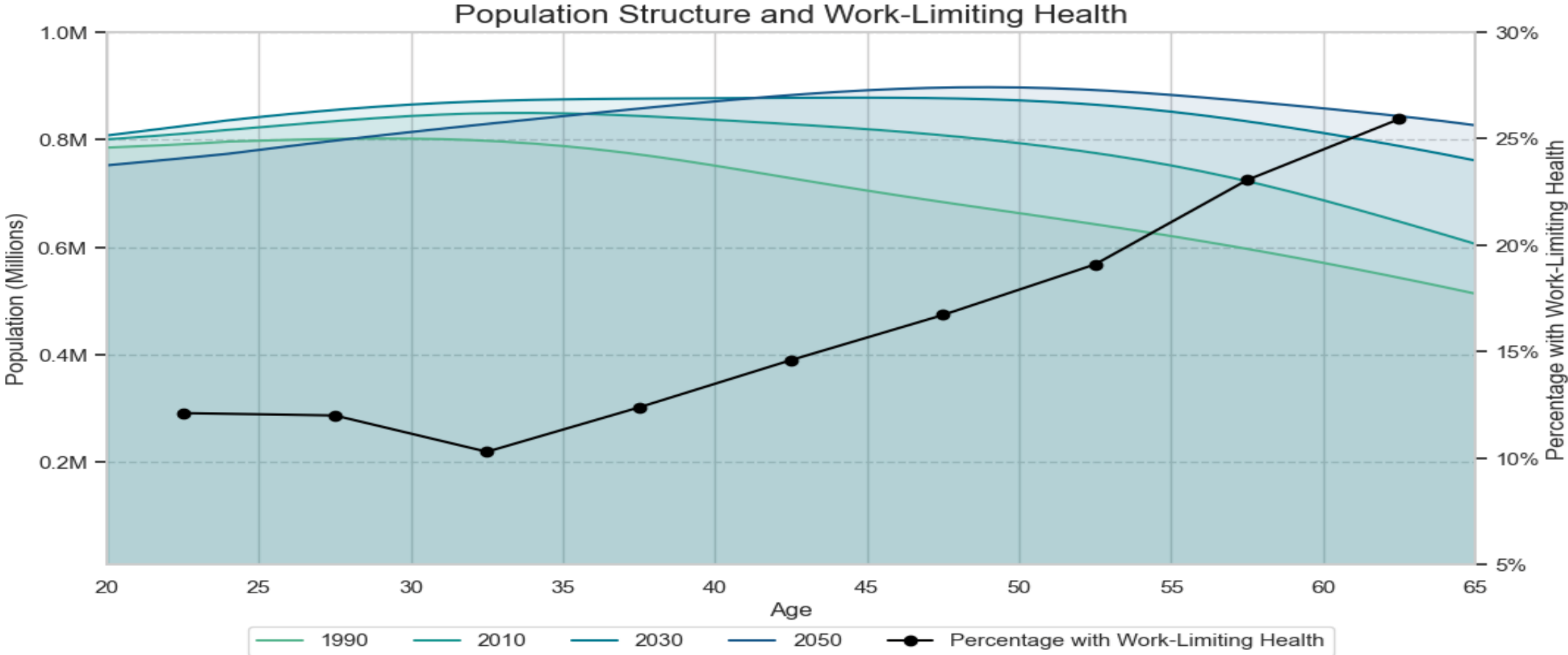




# The Macroeconomic Case

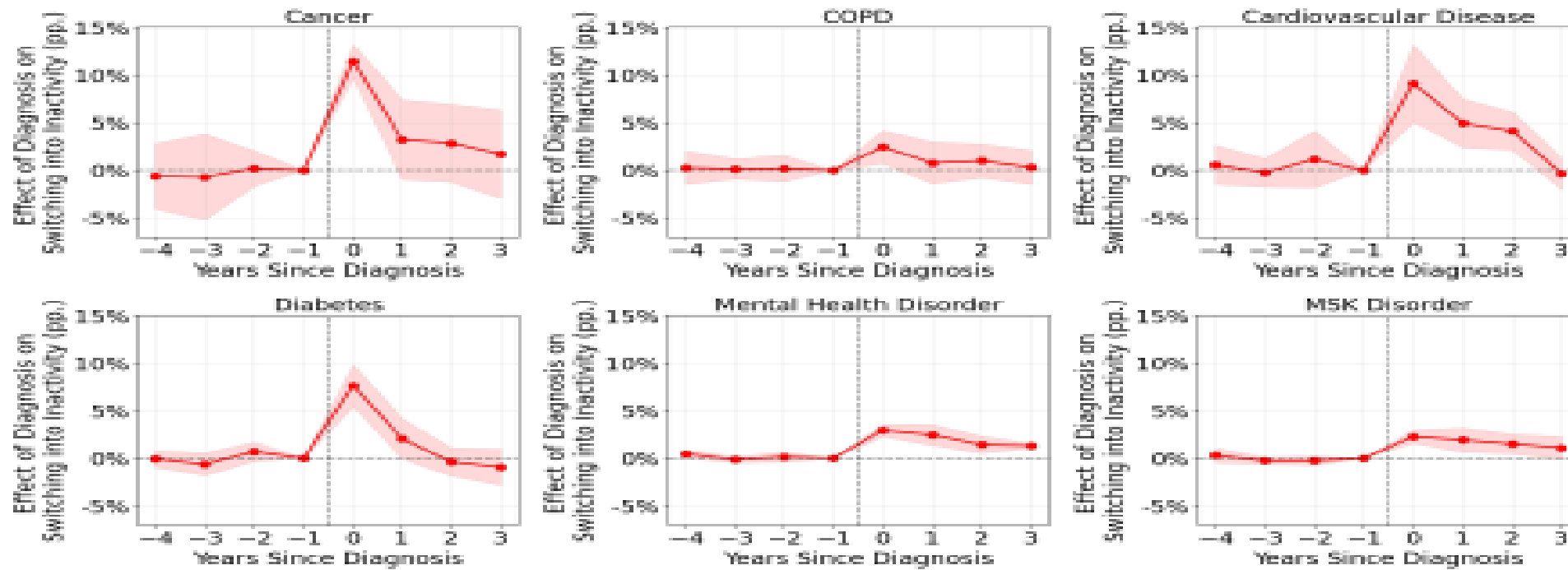
- To support a shift to prevention we need to think differently about health gains
- Need to take into account the macroeconomic consequences
- Not all health expenditure is equal
  - Some have bigger effects on health
  - Some have bigger impacts on employment and GDP
- In an ageing society, the link between health and GDP becomes more important and increases fiscal importance of how much is spent on health and on what types of expenditure

# With an Ageing Population, Health has increasingly first order Macroeconomic Effects



Source: UN World Population Prospects 2022 & ONS Labour Force Survey

**Figure 8: Effect of chronic disease diagnosis on likelihood of transitioning into inactivity**



**Note:** This figure presents estimates of the percentage point change in the likelihood of transitioning from employment to inactivity following a chronic disease diagnosis. Estimates are obtained from using the LP-DiD estimator to estimate the specification in Equation 9 using a panel that is balanced across age and income. To obtain estimates for the effect on individuals who received their diagnosis while in employment, the pool of treated individuals is restricted to include only those who receive a given disease diagnosis while in employment (i.e., those who report being actively in the labor force in the survey wave prior to the wave in which they report their diagnosis). The shaded areas indicate 95% confidence intervals around the point estimates.

Better Health

Reduced  
Mortality,  
Larger  
Population

Higher  
Labour Force  
Participation,  
Increased  
Employment

Increase  
Average  
Hours  
Worked

Reduced  
Healthcare  
costs/Benefits  
and Increased  
Tax Revenue

Higher GDP

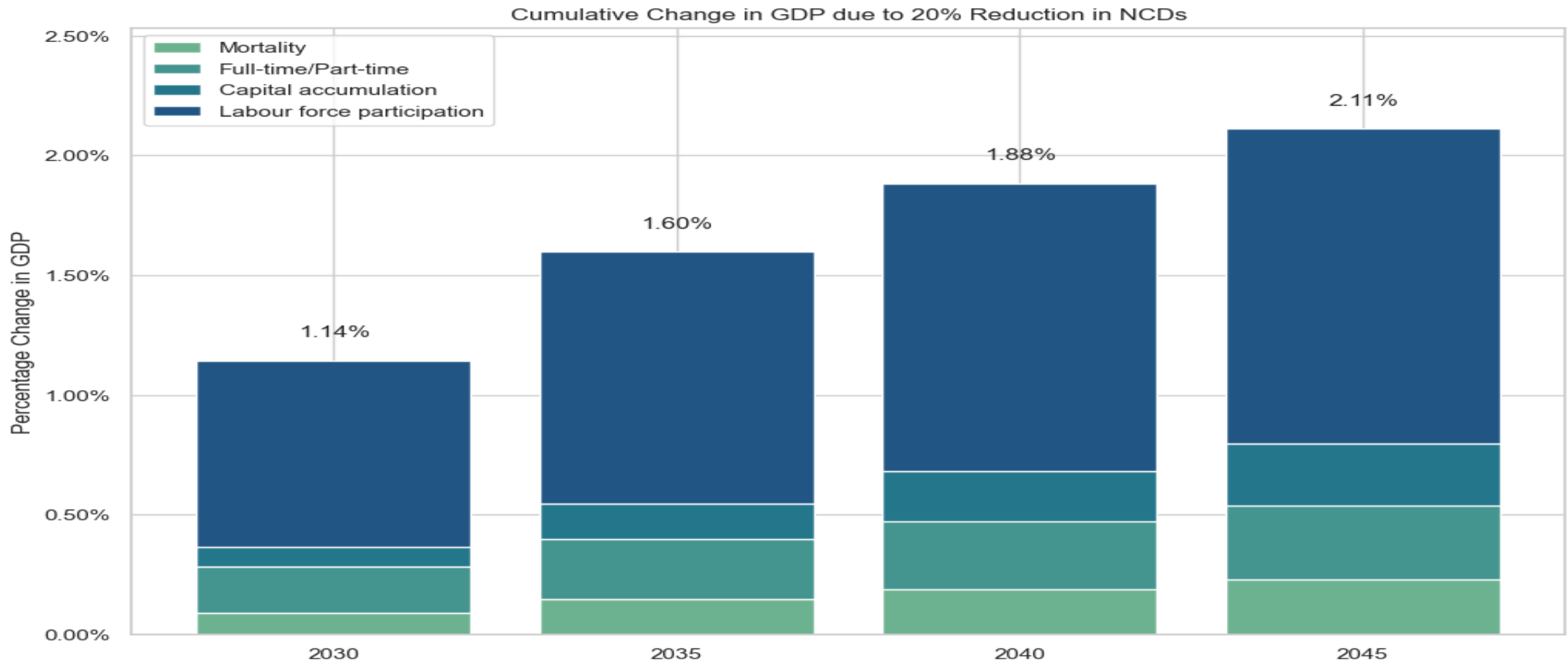
1) How big is the impact?

2) How quickly does it come through?

3) How does it work?

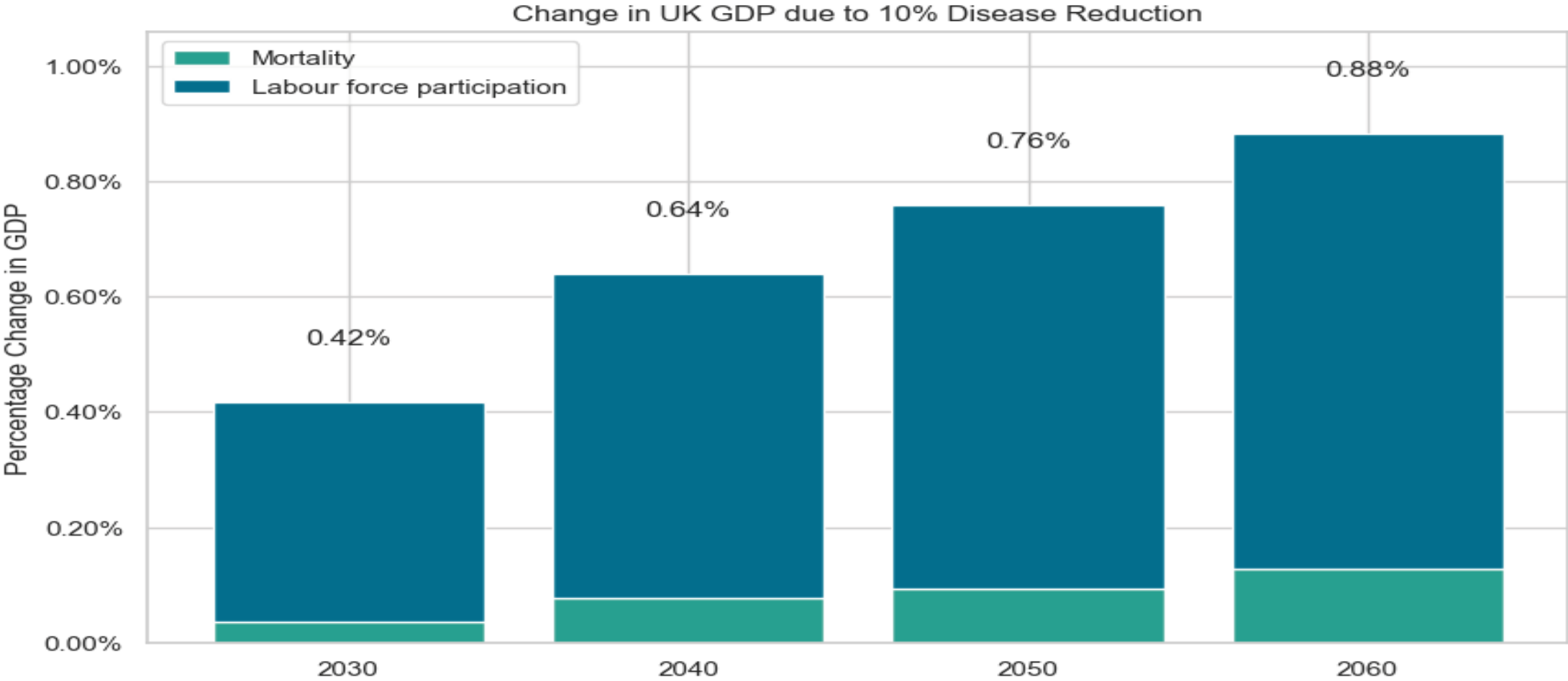
4) Who is most affected?

- 1) The effects are big – short and long run.
- 2) Around half of benefits come through in five years



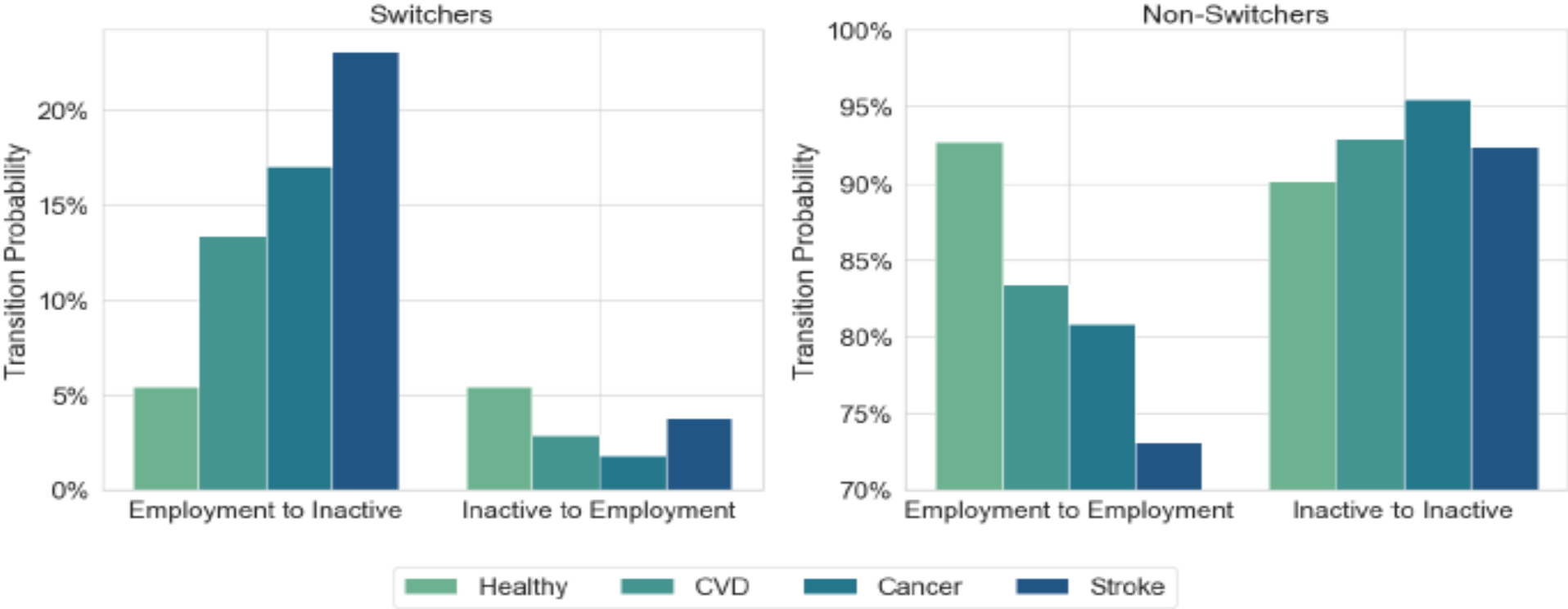
Schindler and Scott (2024) "The Macroeconomic Impact of Chronic Disease on the UK Economy"

# Labour Force Effect Crucial



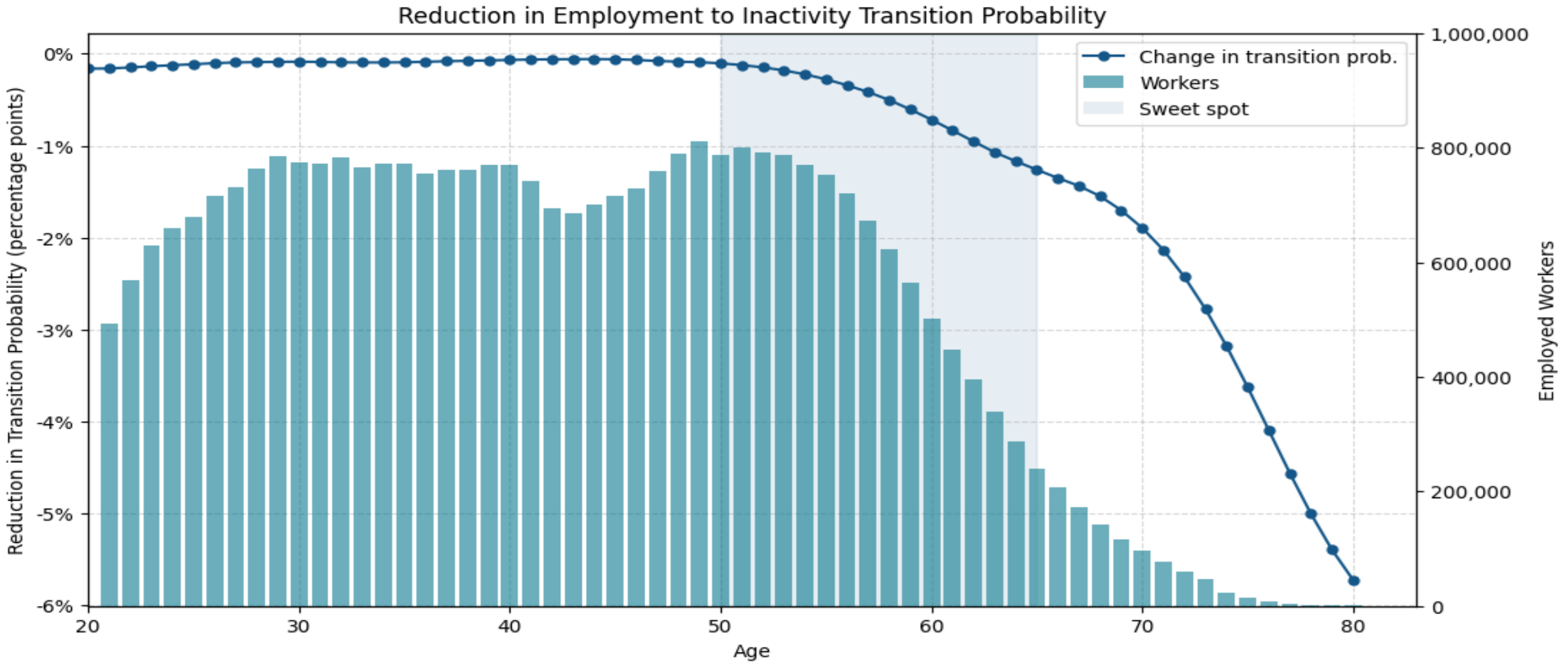
3) Biggest impact is from keeping people in work, not getting them back to work

Figure 2 – Employment transitions by health status



Source: UK Household Longitudinal Study (UKHLS) for survey years 2009 through 2019. Data derived from survey participants aged 50–64.

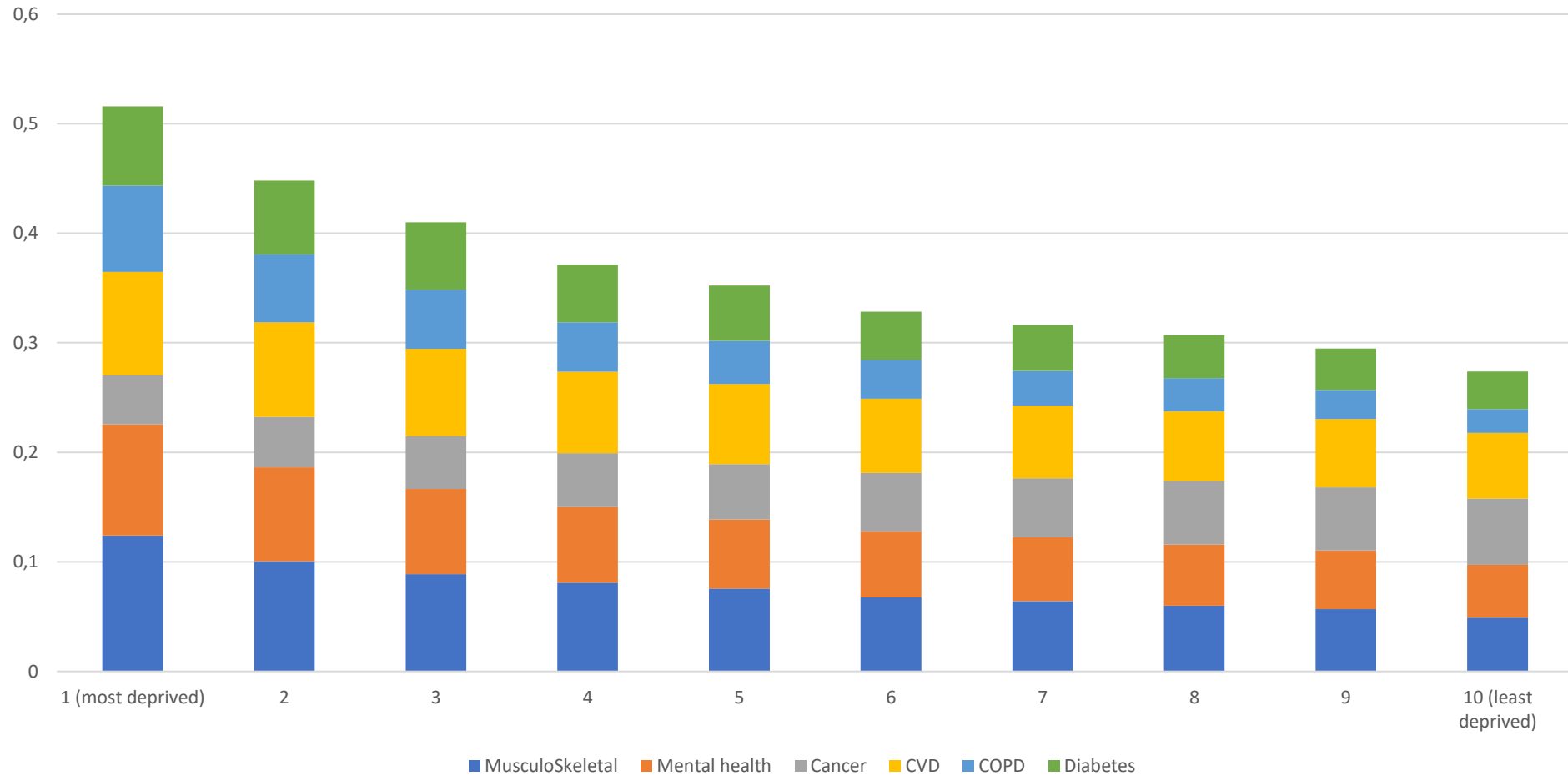
Focusing on Health between 50 and SPA is a “sweet spot” – biggest impact on transition probabilities and large amount of workers to affect





# 4) Potential to Narrow Health Inequalities

Disease Burden by Deprivation (IMD Decile)





Long Life



Healthy Life  
Expectancy



Productive  
and Engaged

Three-Dimensional Longevity Dividend

# Conclusions

- “Demography is not destiny” – we need to invest in later life human capital
- Ageing is malleable – both underlying health and resulting behaviour – and we need to focus on changing how we age and adapting to longer lives
- The biggest health challenge we face now is to age well – that isn’t just about how we care for 80 and 90 year olds
- Requires a much greater focus on health life expectancy as a key policy target
- The link between health and GDP is changing
- Keeping people working from 50 to state pension age is crucial
- Maintaining health is a key issue here – ‘prevention’
- Key policy aim has to be achieving a three-dimensional longevity dividend – will be a major source of both economic growth and welfare gains
- Countries who adapt and adjust to longevity will see best macroeconomic performance and substantial welfare gains