European Research Institute for the Biology of Aging

university of groningen

ERIBA

University of Groningen and University Medical Center Groningen invest in aging research

UMCG

Focus on Healthy Aging

Adding more healthy years to human life

Pioneering in research beyond treatment and cure

-mechanisms of disease

-prevention

-innovative treatments

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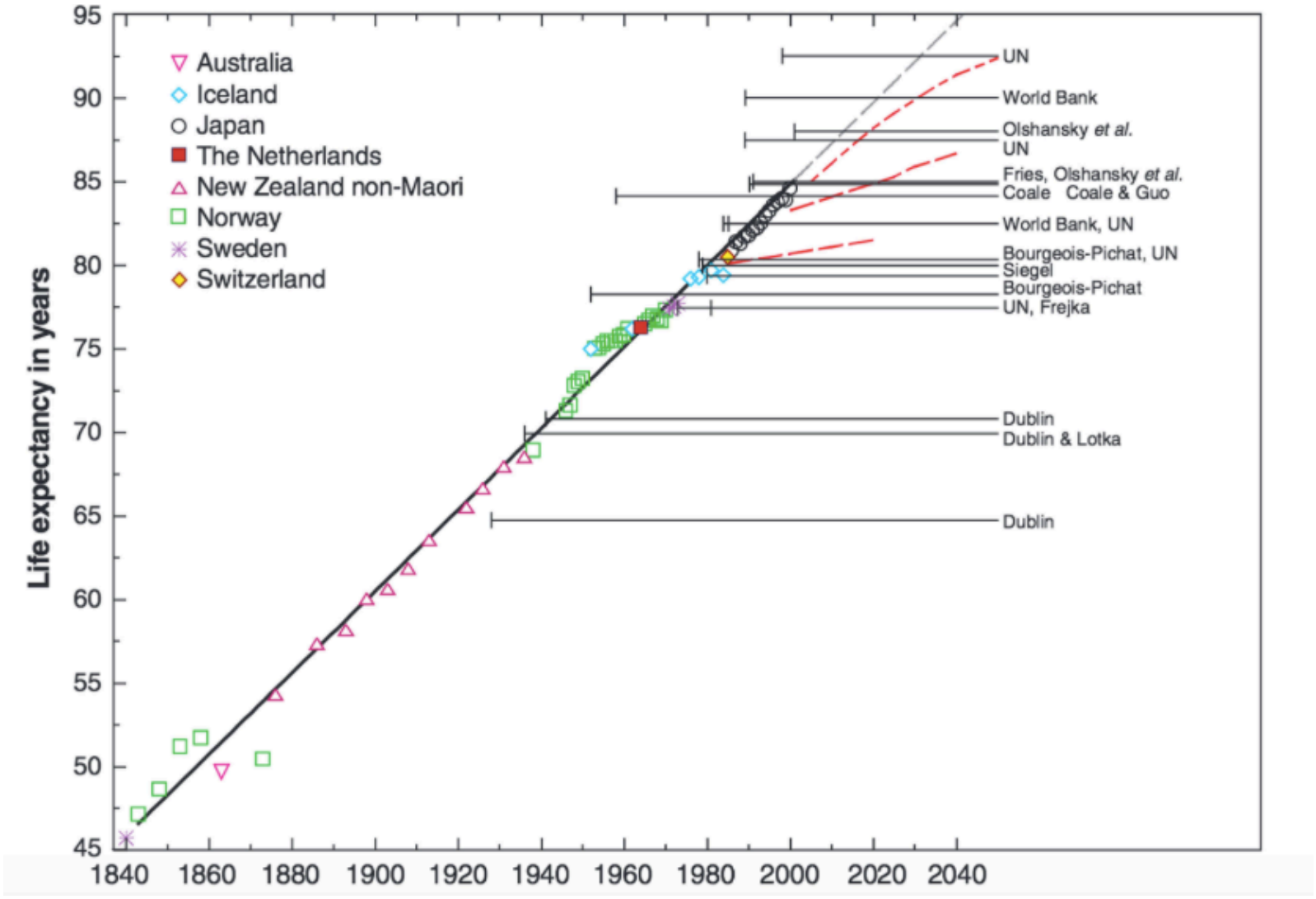
Discovering mechanisms of ageing and age-related disease, to develop new interventions

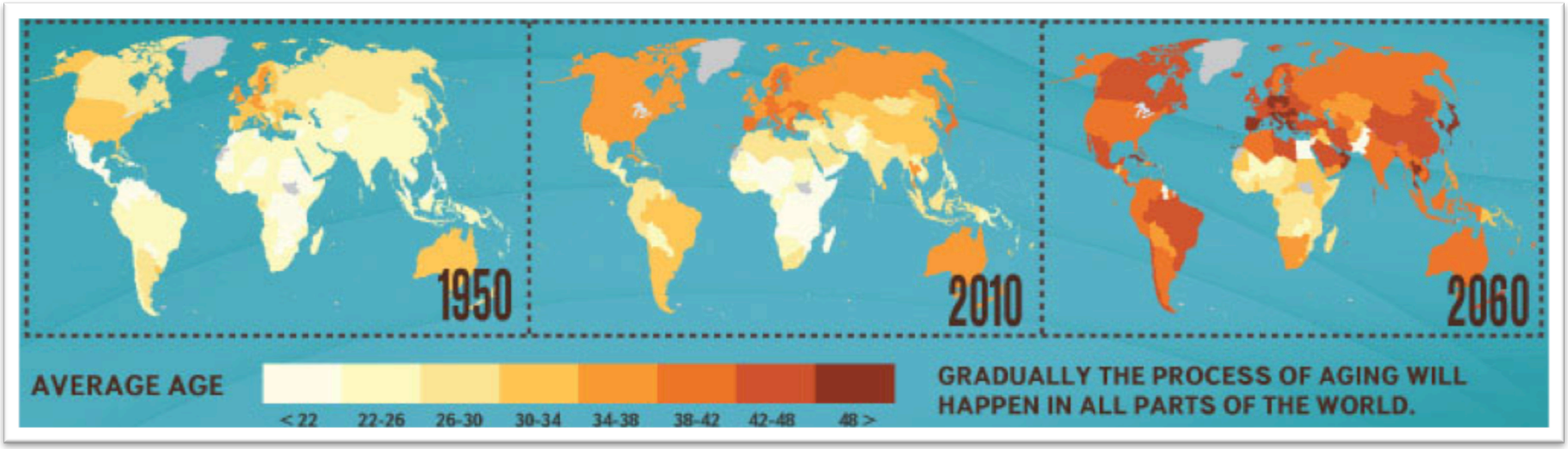
-Since 2010 > € 50 M strategic investments in aging research

-Since 2012 > € 30 M in investigator-driven aging grants

Record female life expectancy from 1840 to the present

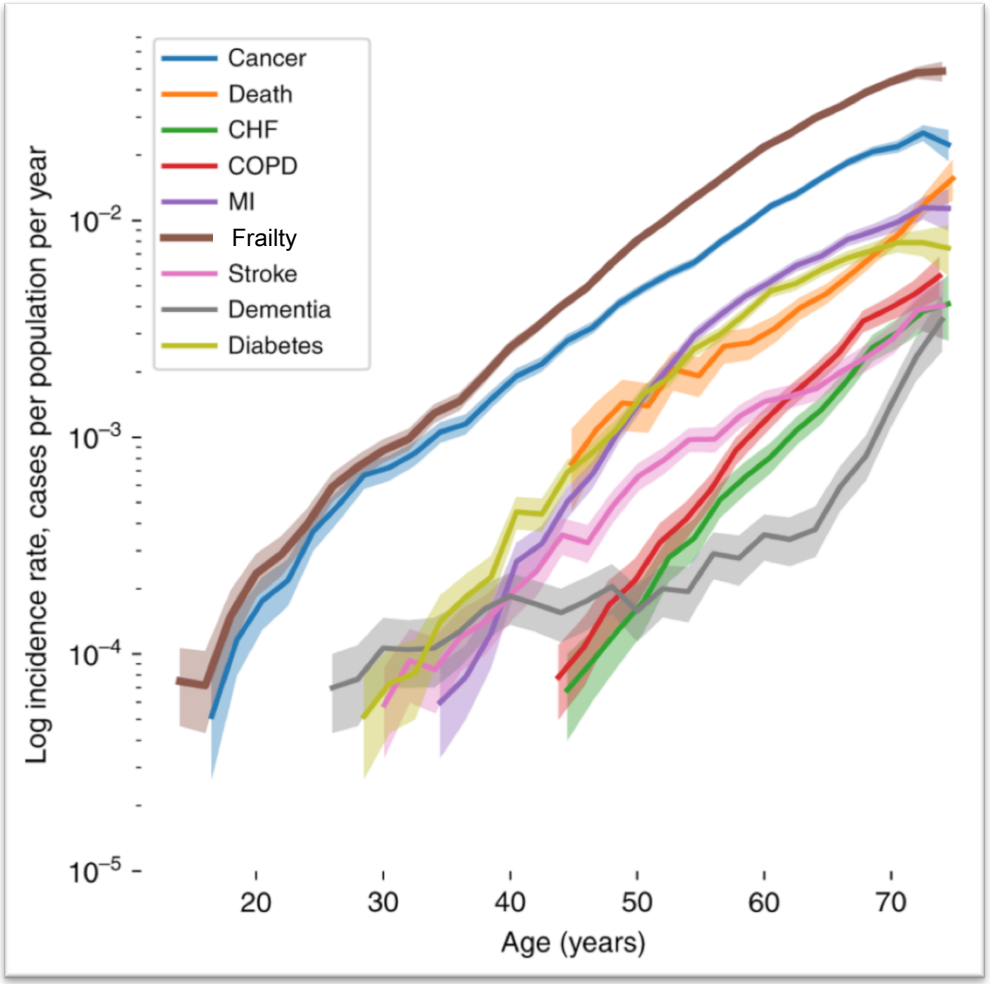


The emergence of an aging society



The World Bank, 2016

The challenge of an aging society

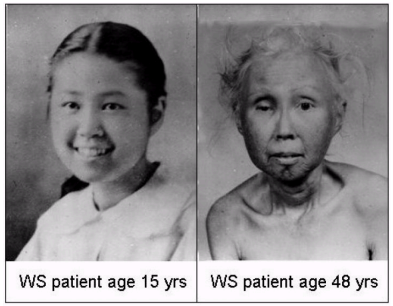


dutch national research agenda

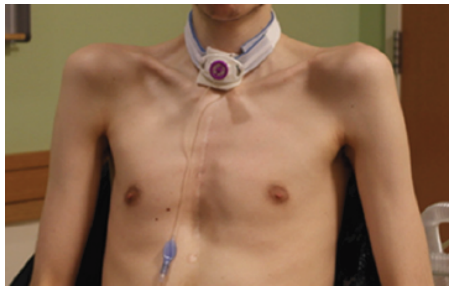
"How can we develop new drugs and treatment methods that will keep us as healthy and vigorous as possible"

UK Biobank data. Zenin et al. Comm Biol, 2019

Mutations can accelerate aging



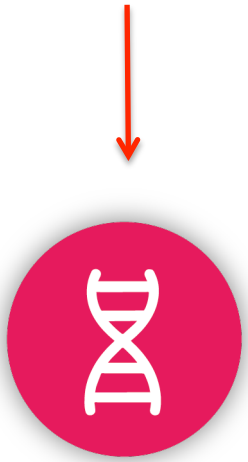
Werner



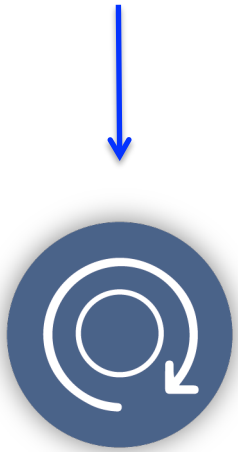
BAG3 myofibrillar myopathy

Obesity

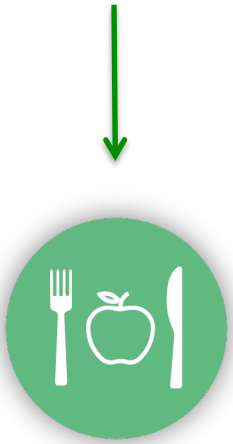
Hutchinson-Gilford



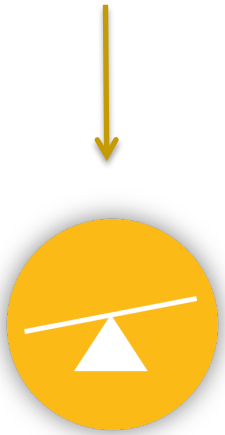
Genome integrity



Protein homeostasis



Metabolism



Regeneration

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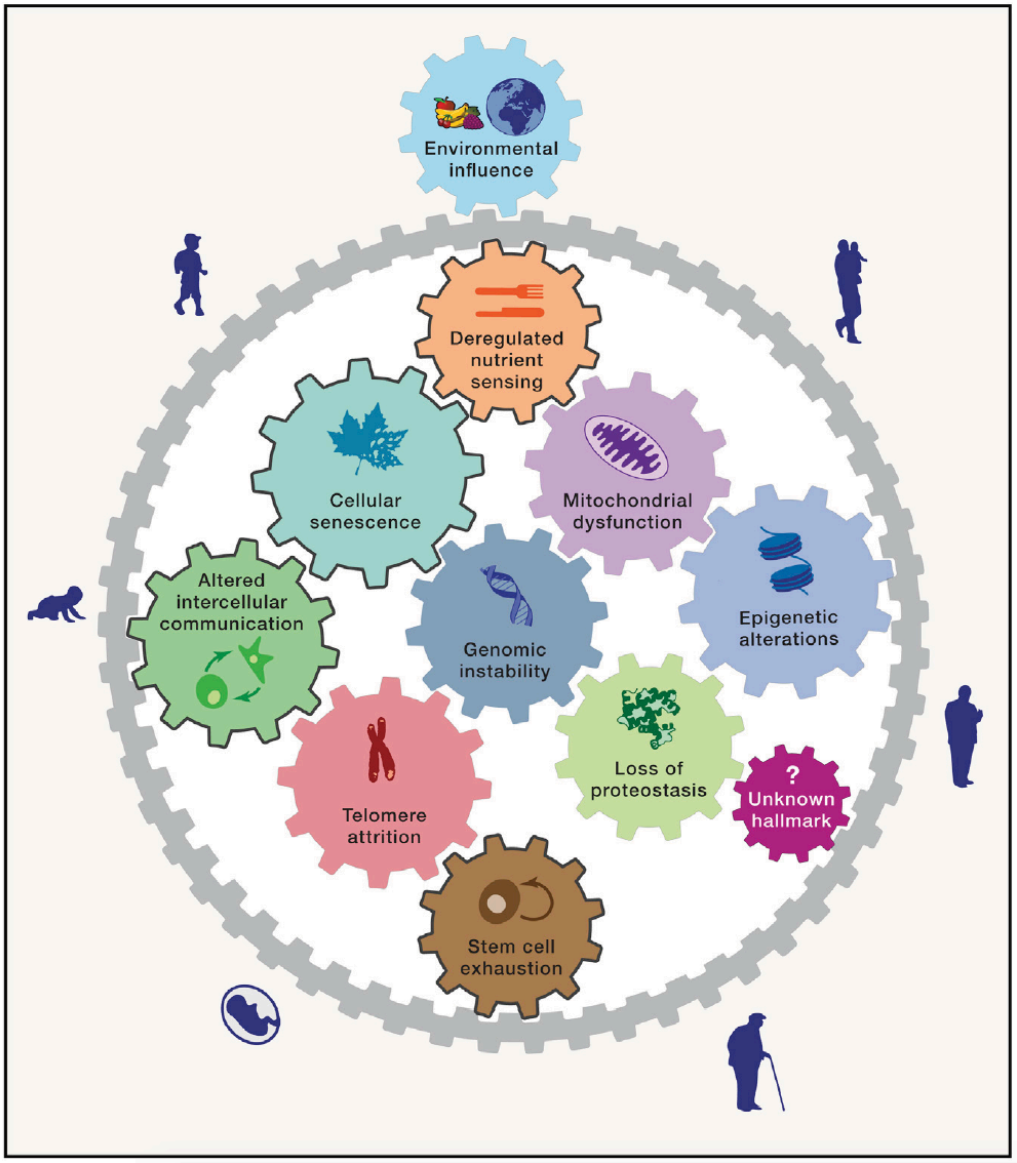
Hallmarks of aging



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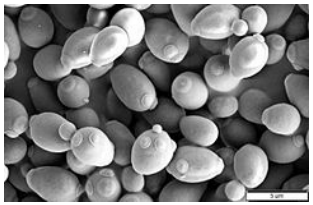
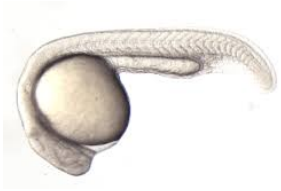
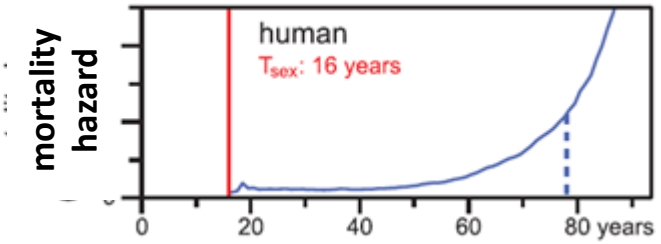
Singh et al, Cell, 2019

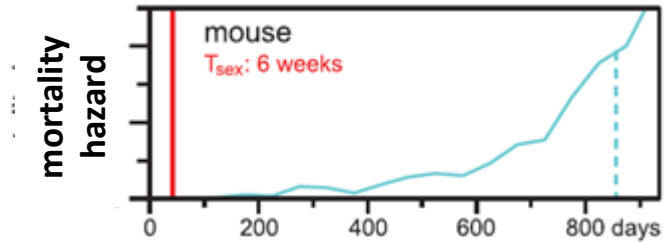
Models of Aging

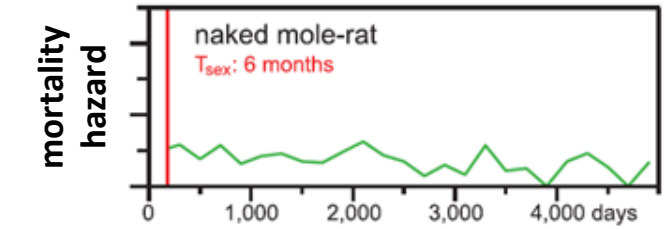




Resilience to aging is possible







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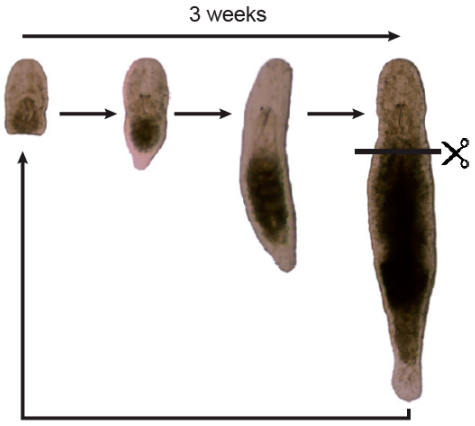
Health span can be increased!

Normal evolution

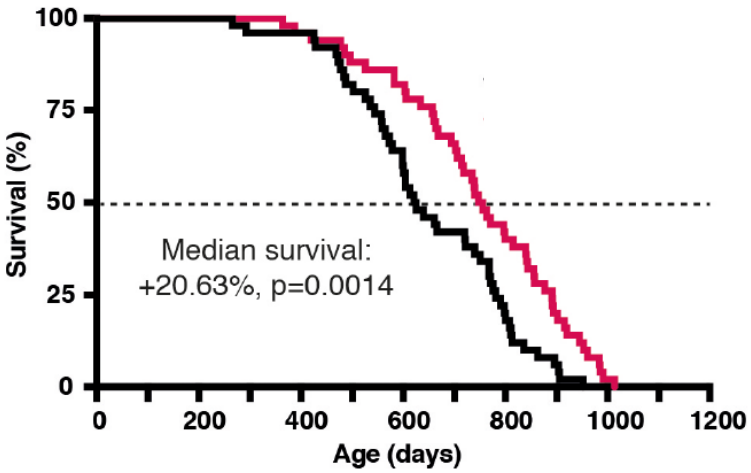
Improved regeneration



Berezikov lab

Genetic engineering

Improved metabolism



Calkhoven lab

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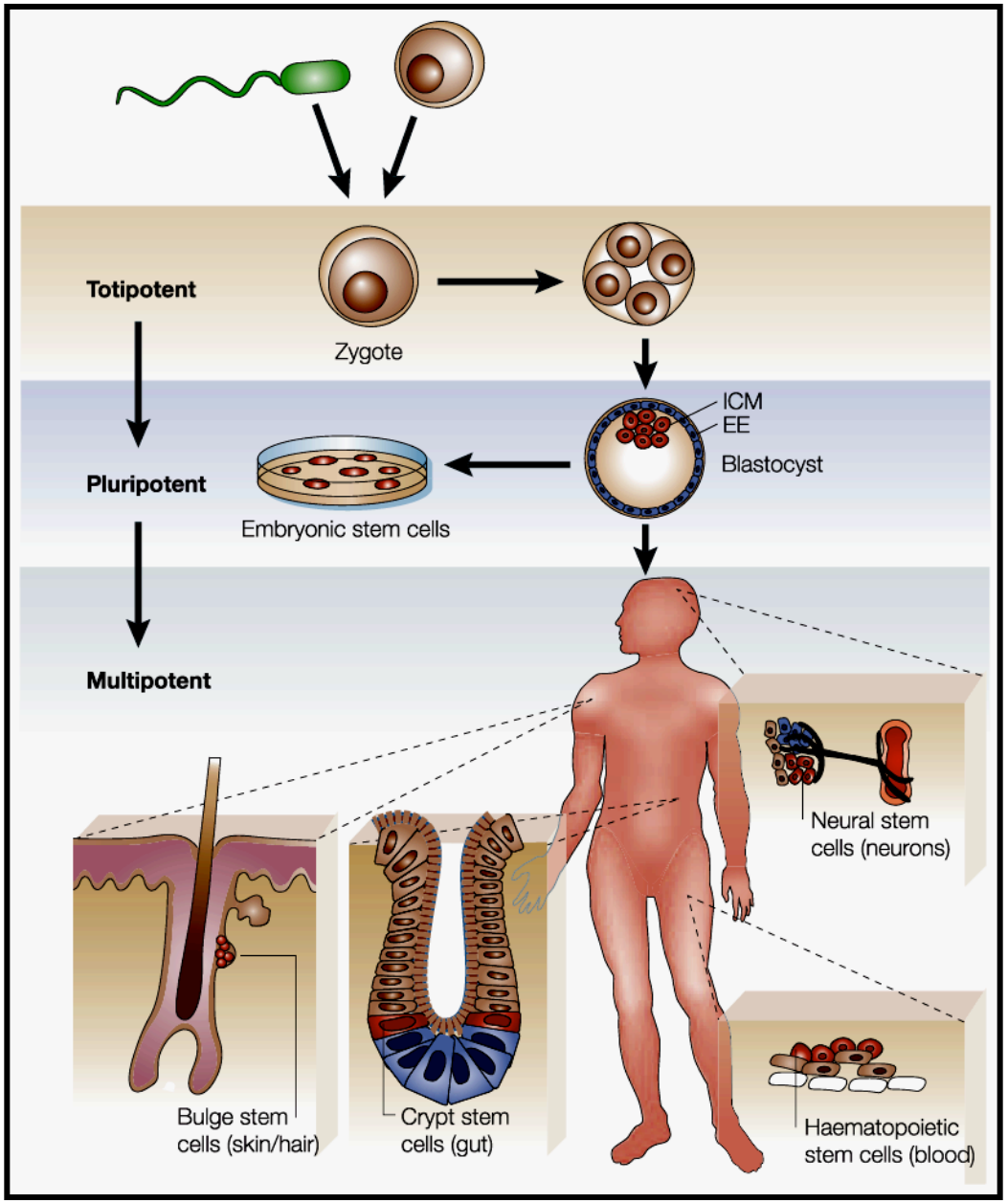
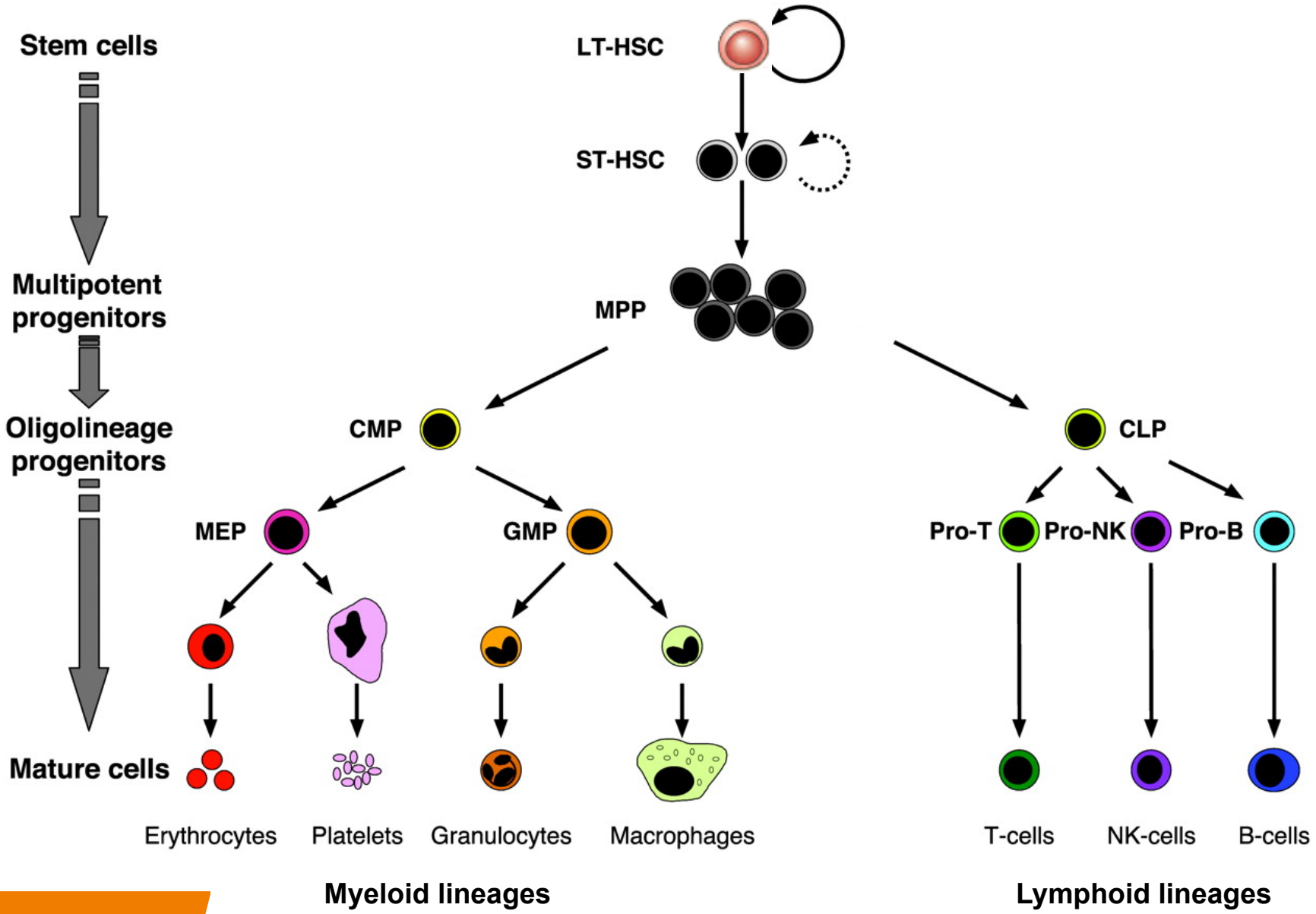
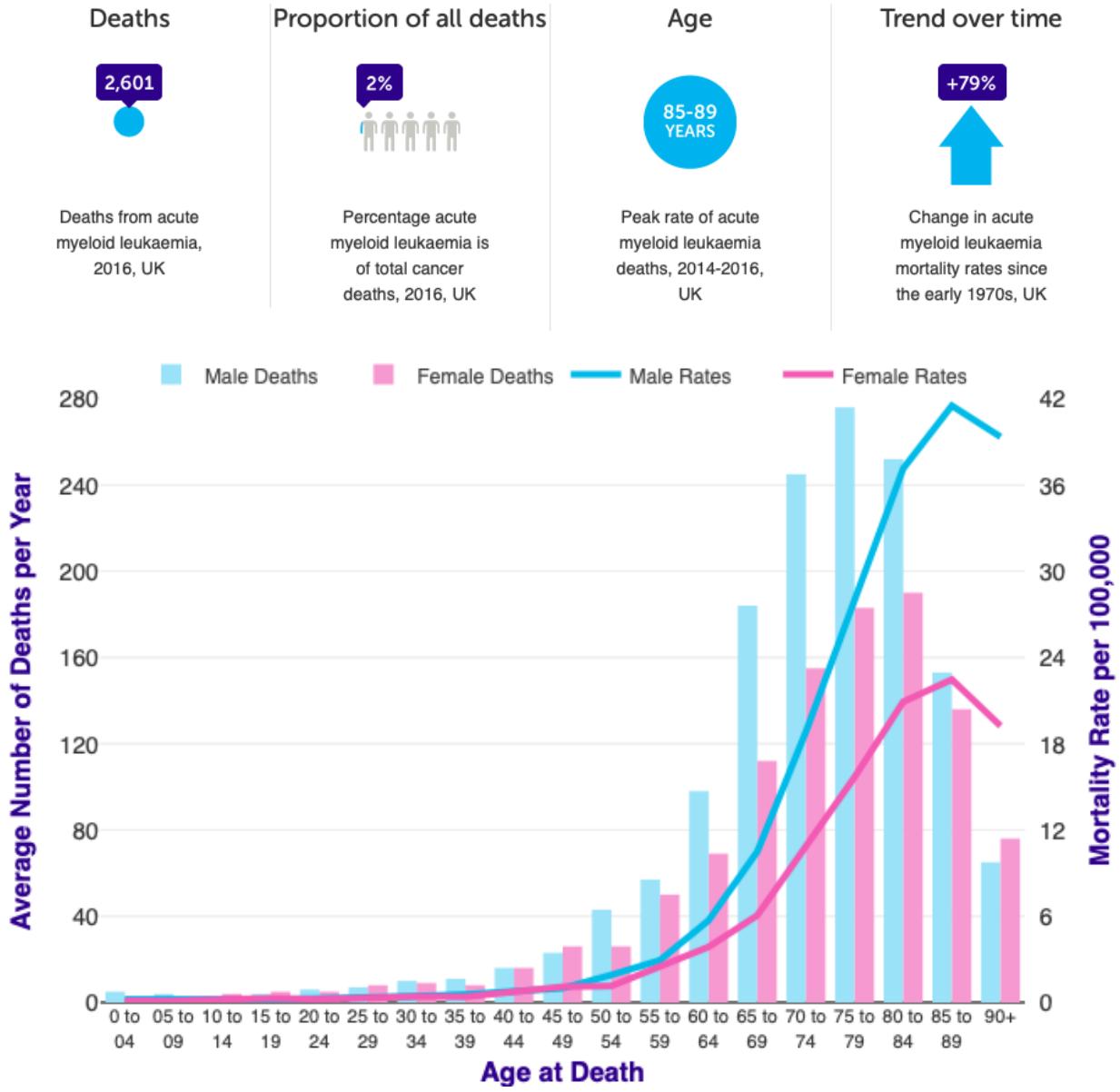
Stem cells are anti-aging agents



Blood cell formation



Acute Myeloid Leukemia is an aging disease



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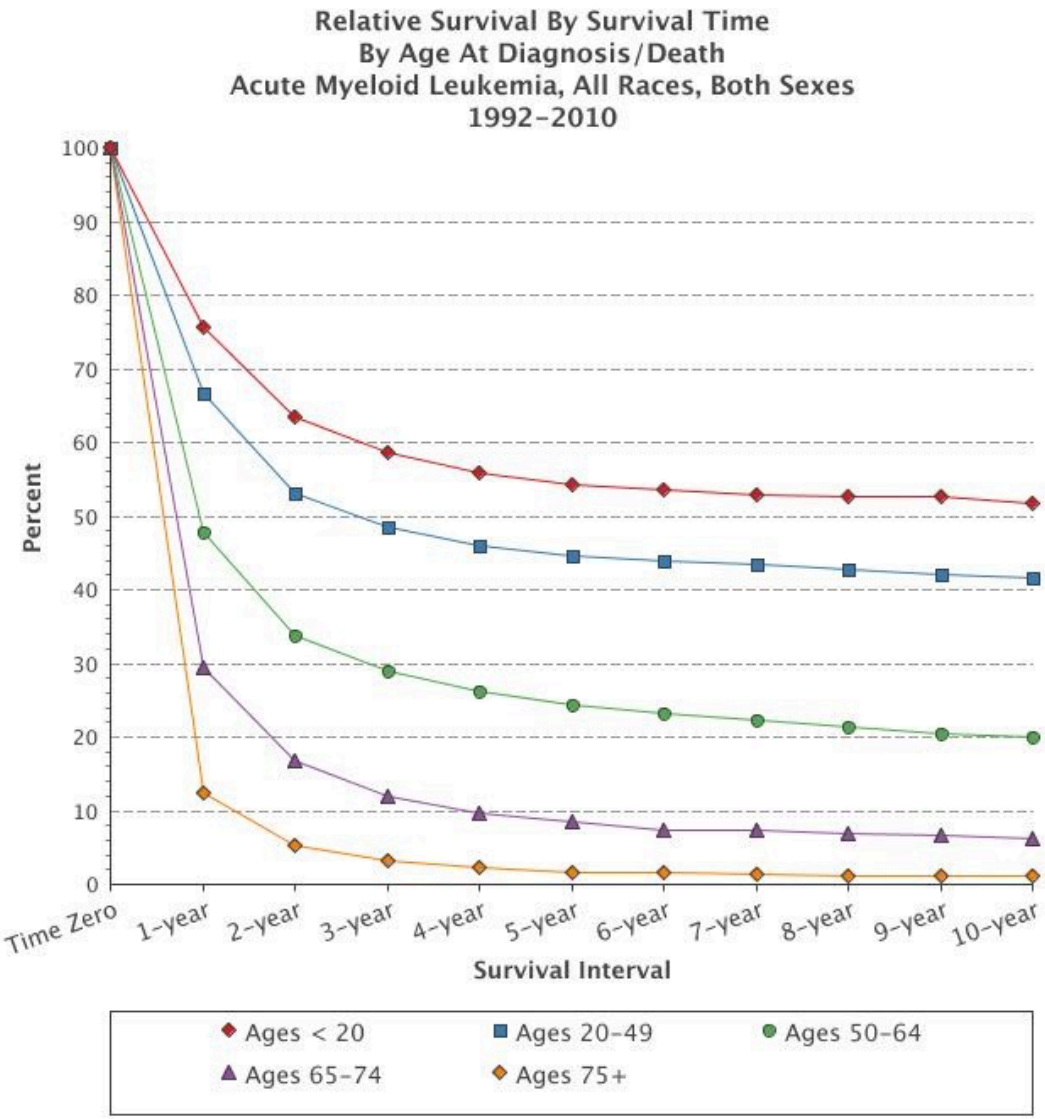
Source: CRUK

Surviving Acute Myeloid Leukemia



Cancer sites include invasive cases only unless otherwise noted.
The annual survival estimates are calculated using monthly intervals.
Source: http://seer.cancer.gov/faststats/selections.php?series=age

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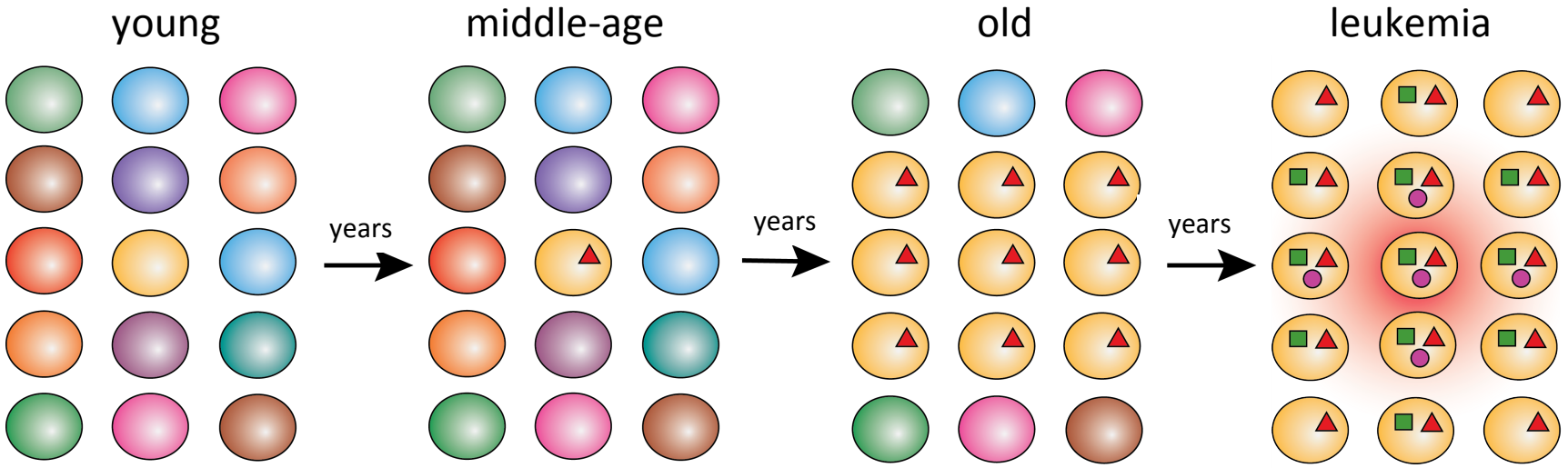
Age-related clonal hematopoiesis



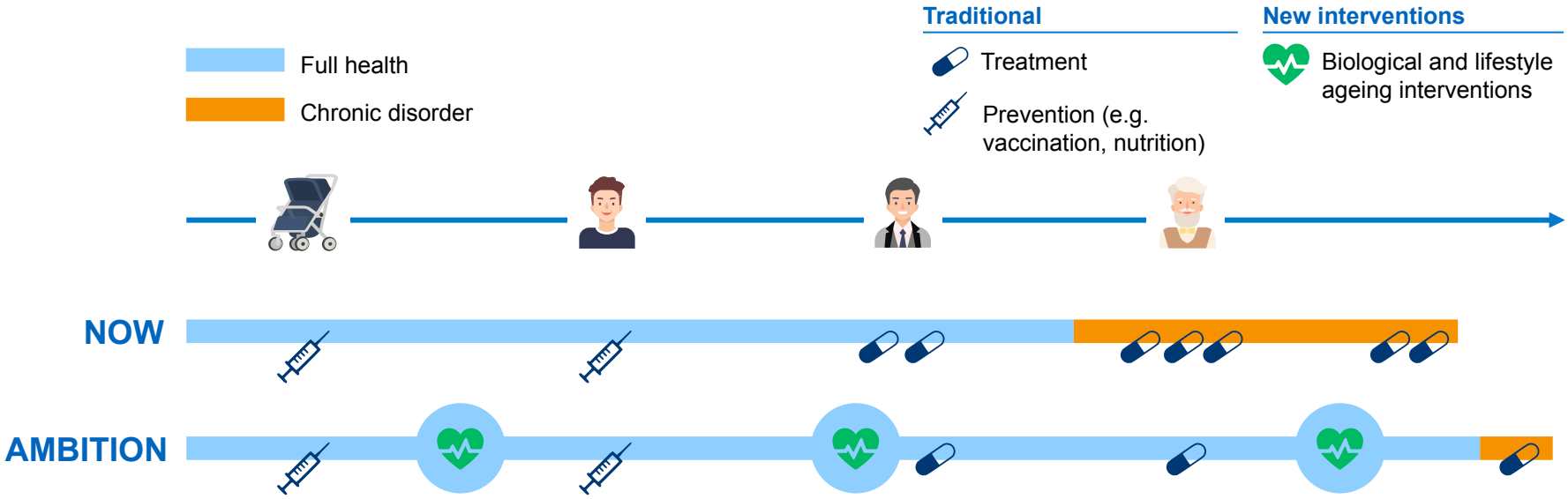
initial mutations

- DNMT3A
- TET2
- ASXL1

second mutations

- FLT3
- NPM1
- IDH1
- RUNX1
- NRAS

Purpose of aging research: Prevention!



Dutch annual healthcare savings by increasing ‘healthspan’

1 healthy year added
= 1% extra

400 million €

5 healthy years
added

2,1 billion €

10 healthy years
added

6,4 billion €

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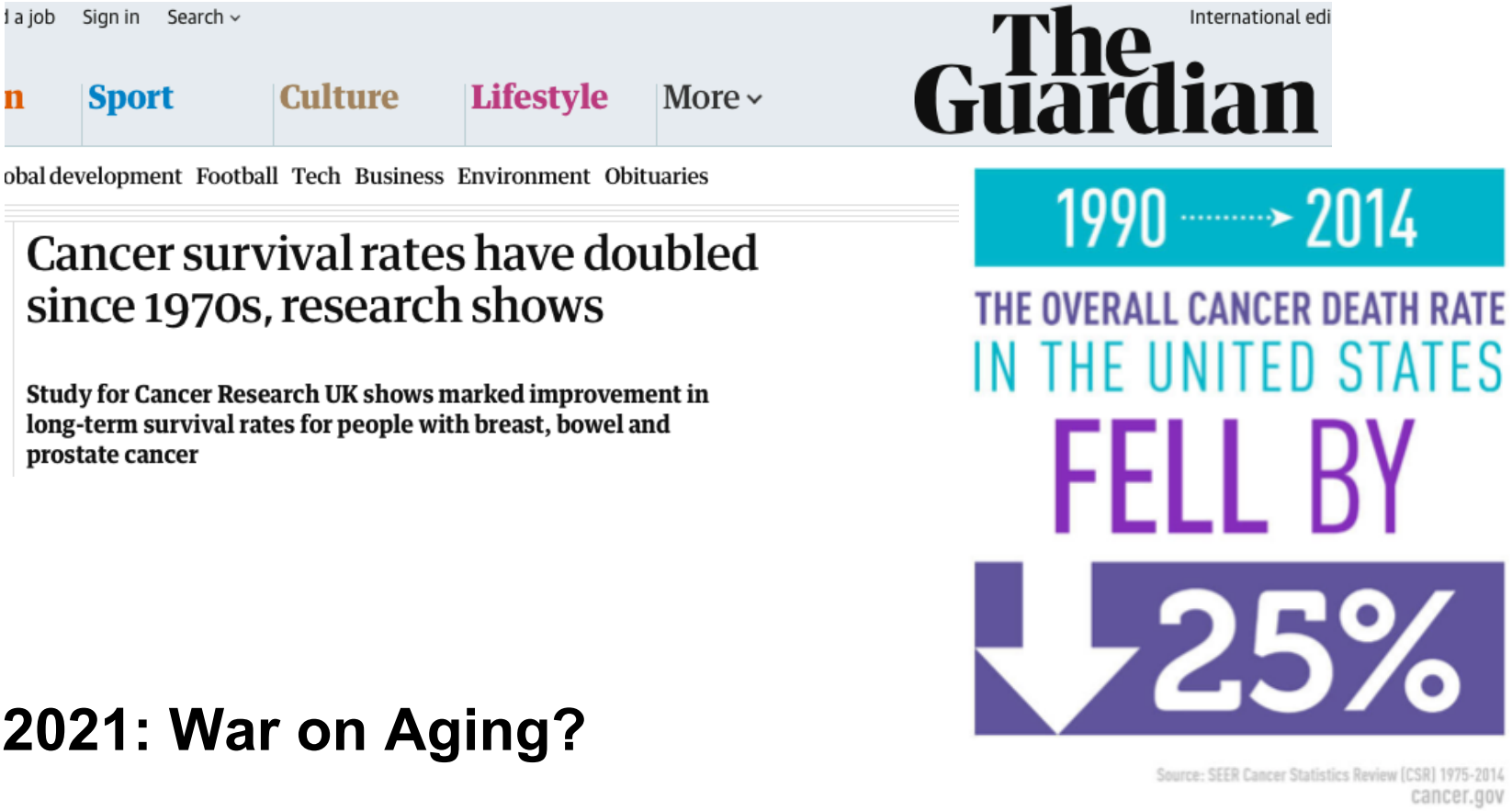
Daniel Howdon and Jochen Mierau, University of Groningen

1971: War on Cancer (National Cancer Act Nixon Administration)



2021: War on Aging?

What is required?