



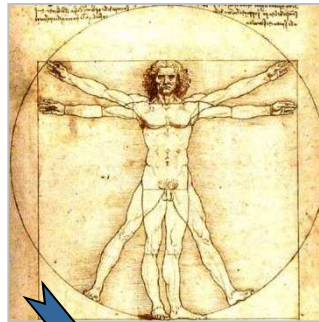
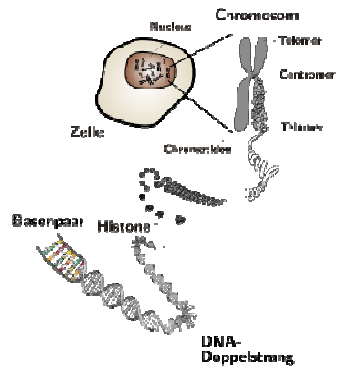
The New Science of Ageing

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The New Science of Ageing

Genetics



Medicine

Biology

Psychology

Bioinformation

Economy

Demography

Ageing

Statistics

Engineering

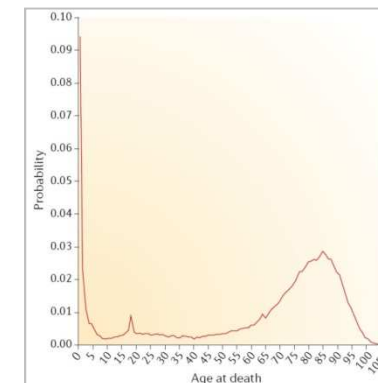
Mathematics

Politics

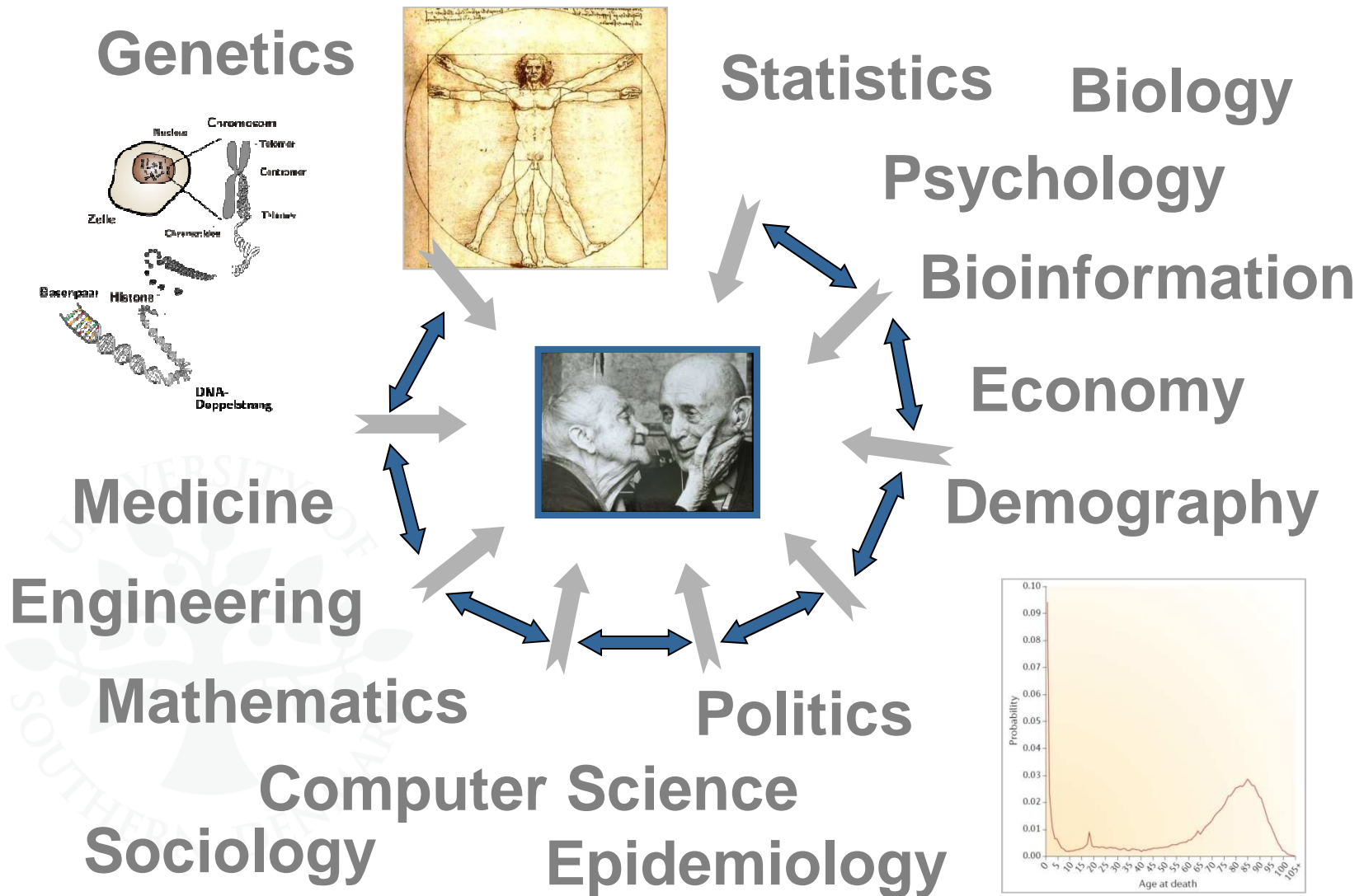
Computer Science

Sociology

Epidemiology

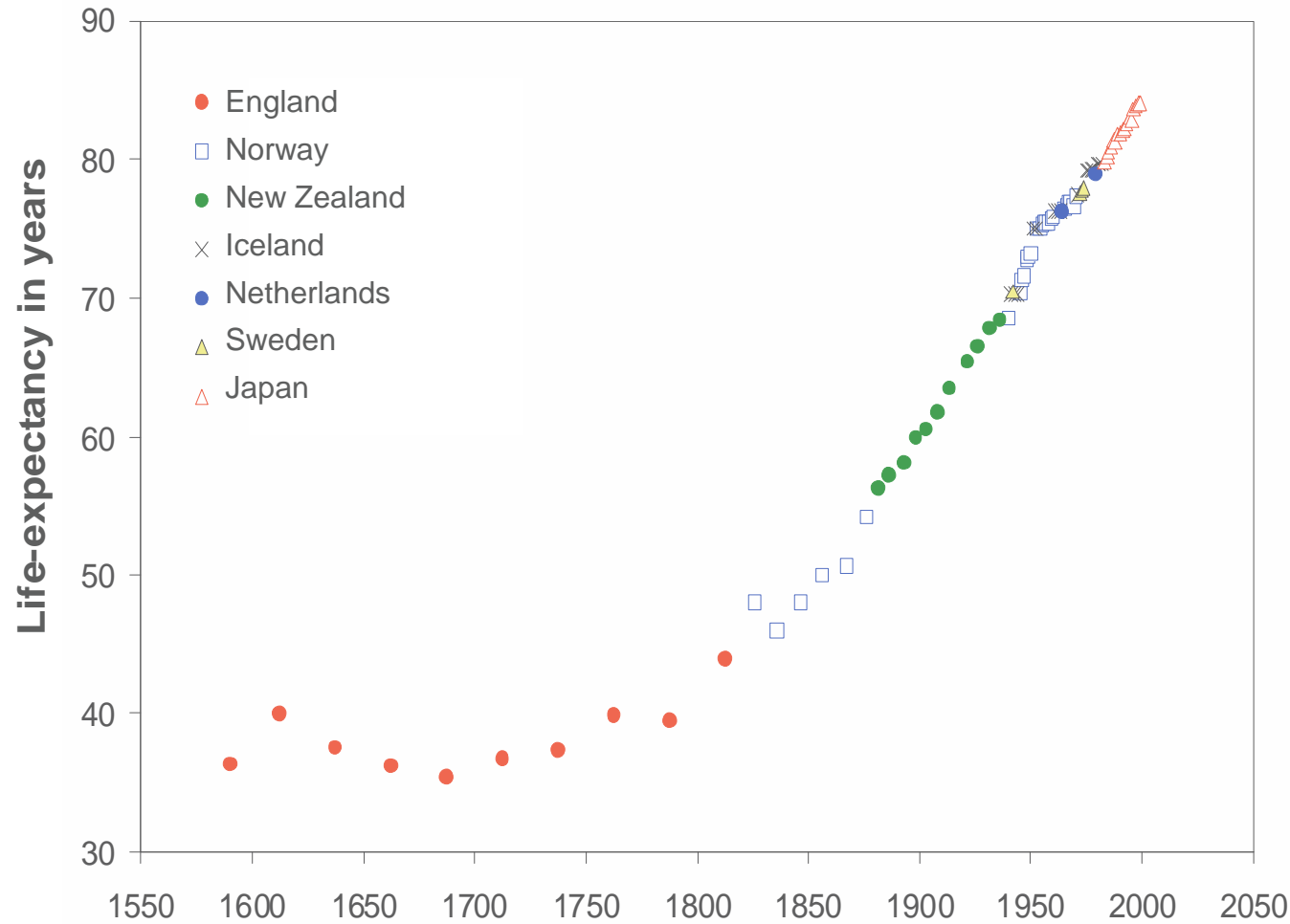


The New Science of Ageing





Record Life-Expectancy



Oeppen & Vaupel. *Science* 2002; Christensen et al., *Lancet* 2009



Oldest age in which at least 50% of a birth cohort is still alive

	2000	2001	2002	2003	2004	2005	2006	2007
Canada	102	102	103	103	103	104	104	104
Denmark	99	99	100	100	101	101	101	101
France	102	102	103	103	103	104	104	104
Germany	99	100	100	100	101	101	101	102
Italy	102	102	102	103	103	103	104	104
Japan	104	105	105	105	106	106	106	107
UK	100	101	101	101	102	102	103	103
USA	101	102	102	103	103	103	104	104

Data are in years. Baseline data were obtained from the Human Mortality Database and refer to the total population of the respective countries.

Christensen, Doblhammer, Rau, and Vaupel: Lancet 2009



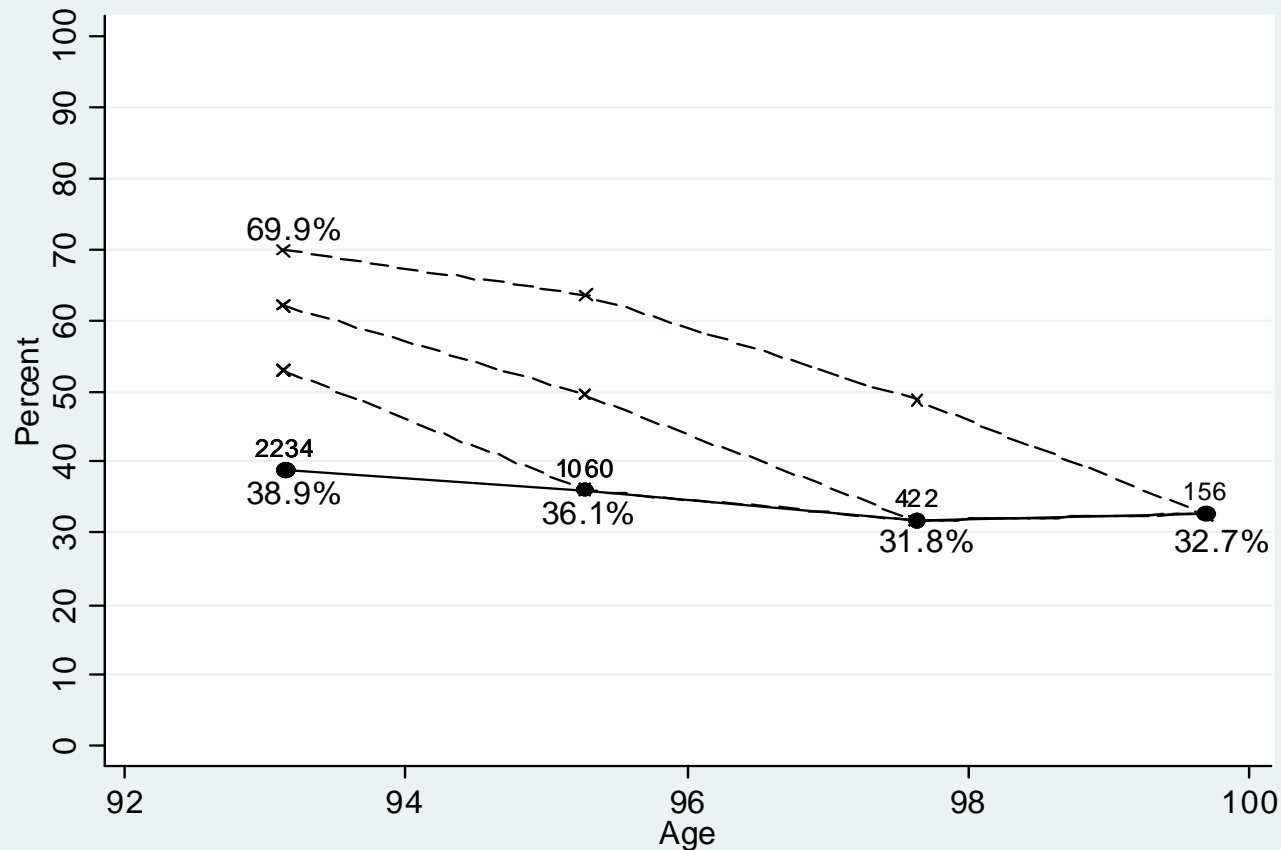
The Fourth Age

**Medical treatment of very old people
– are we doing good ?**

**Does exceptional longevity lead to
exceptional levels of disability?**



Independence in the 1905-Cohort



Christensen et al. PNAS, 2008



The Fourth Age

EXTREME AGES

**100 year olds are doing
as good as 92 year olds**



The Fourth Age

**50% more made it to 100 years
in the 1905-Cohort
compared to the 1895-Cohort**

Still no increased disability level



Twin Design

➤ Heritability

- Lifespan 25%
- Functioning 50%
- Alzheimer 70%
- Parkinson 5%

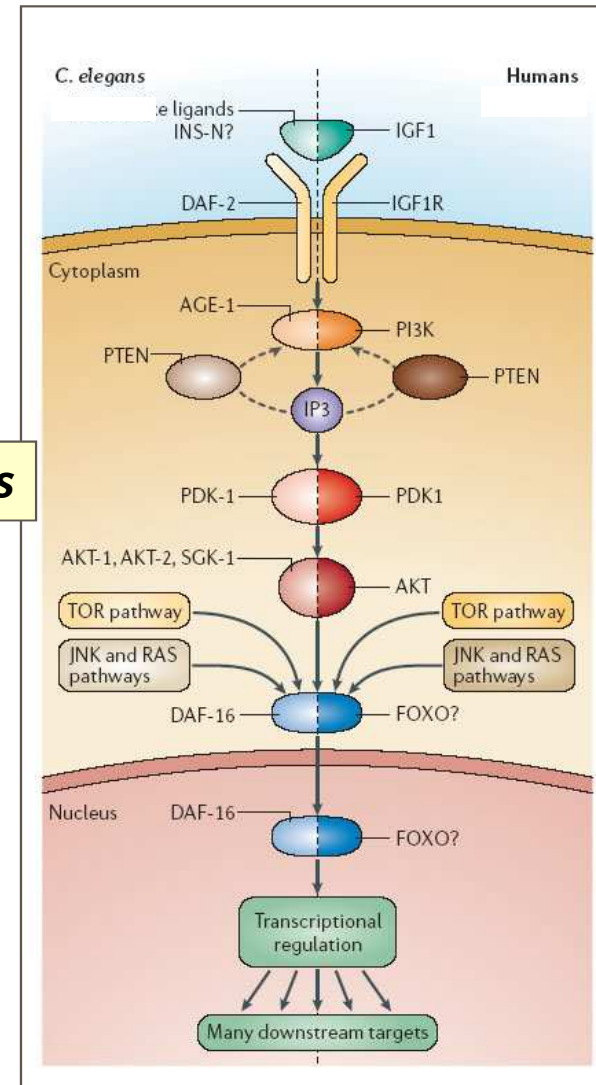




Molecular pathways that lengthen lifespan in *C. elegans* and the corresponding components in humans

C.elegans

Humans

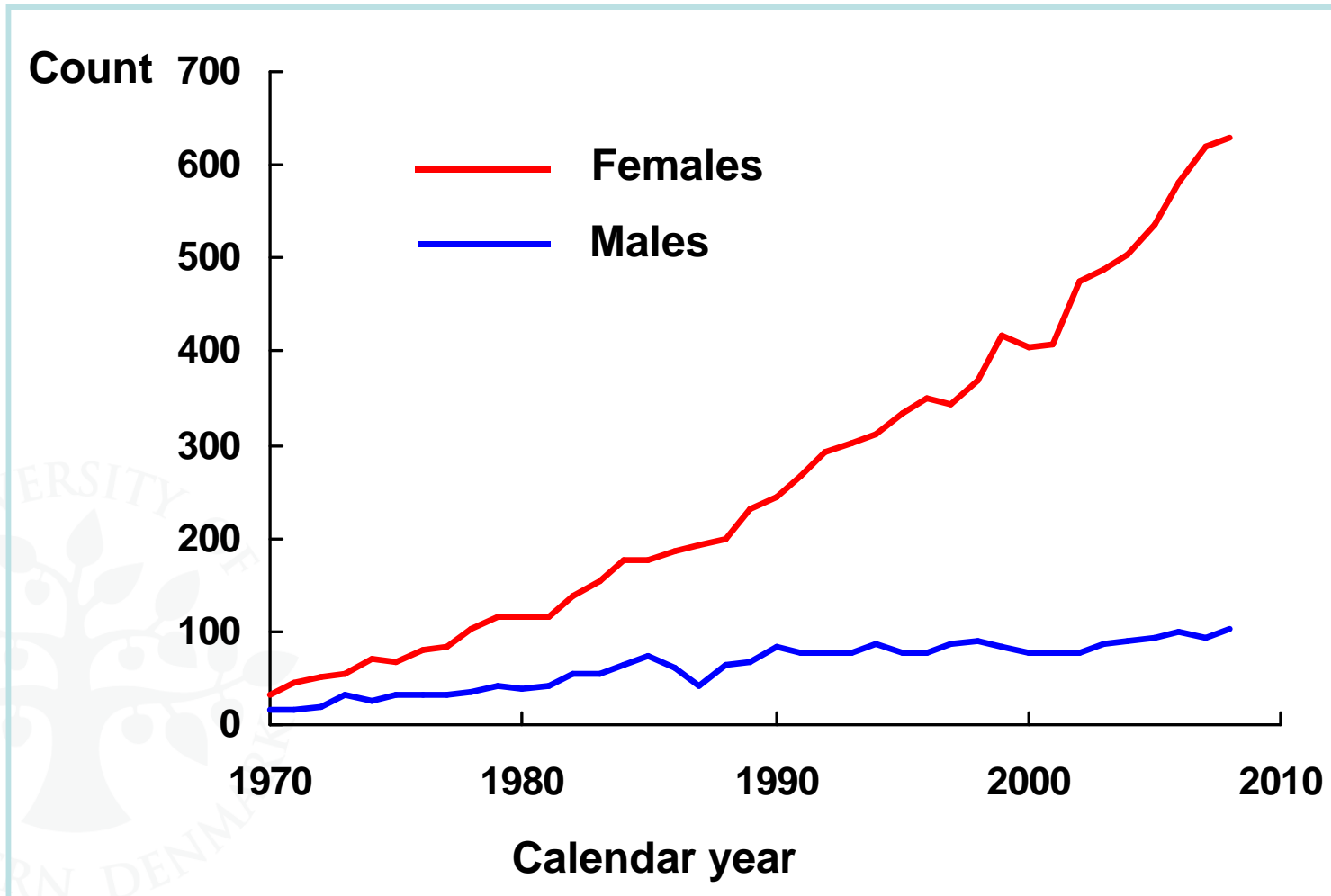


Christensen, Johnson, and Vaupel: Nat Rev Genet. 2006



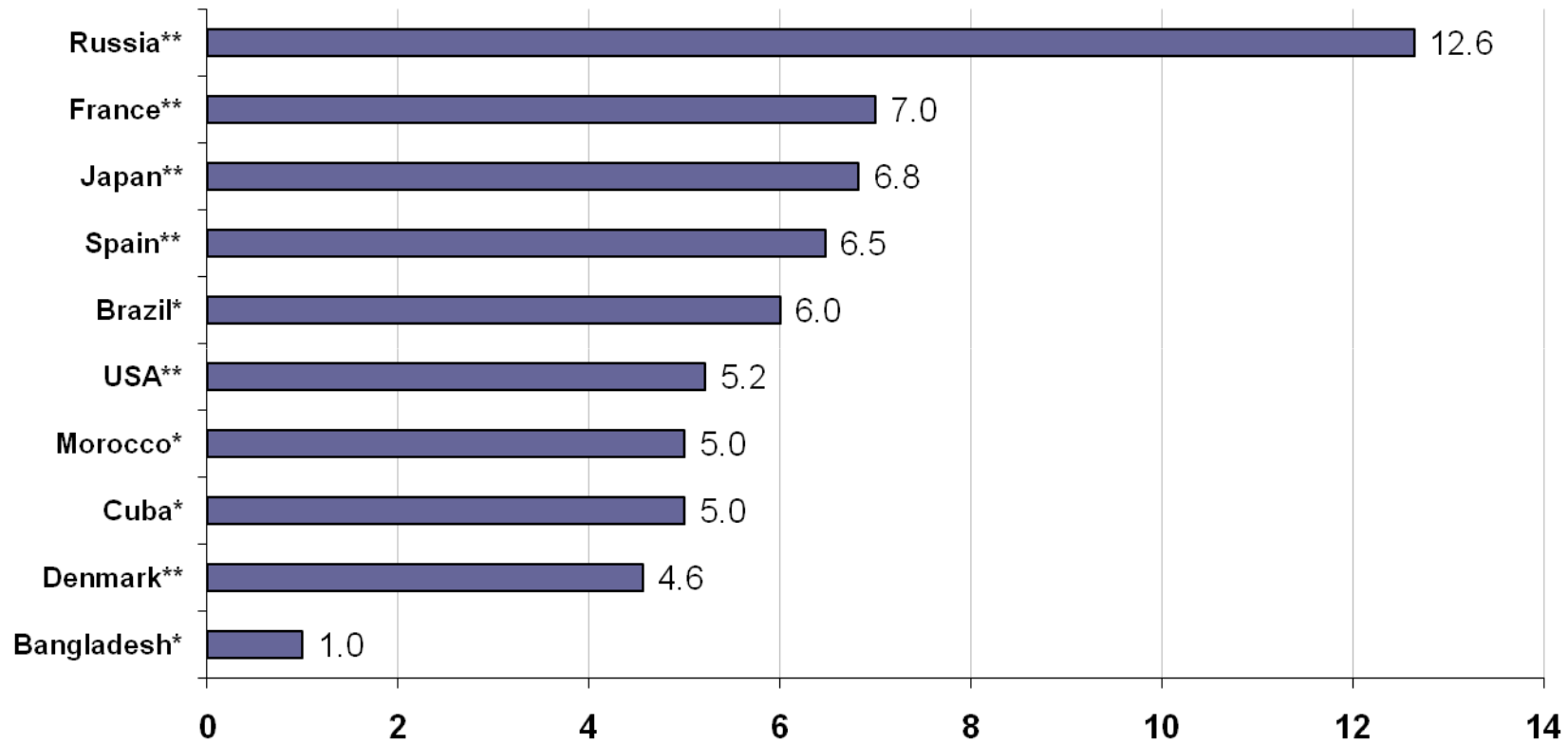


Number of Danish centenarians 1970-2008





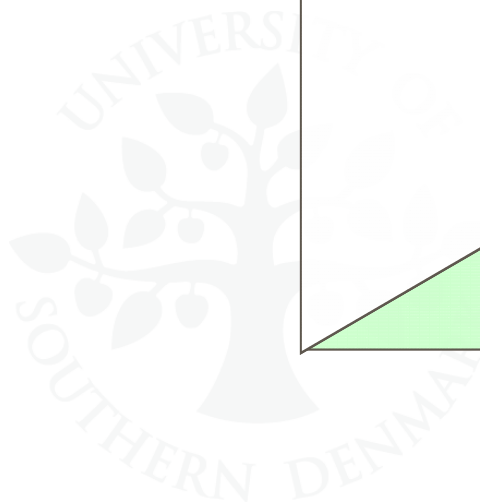
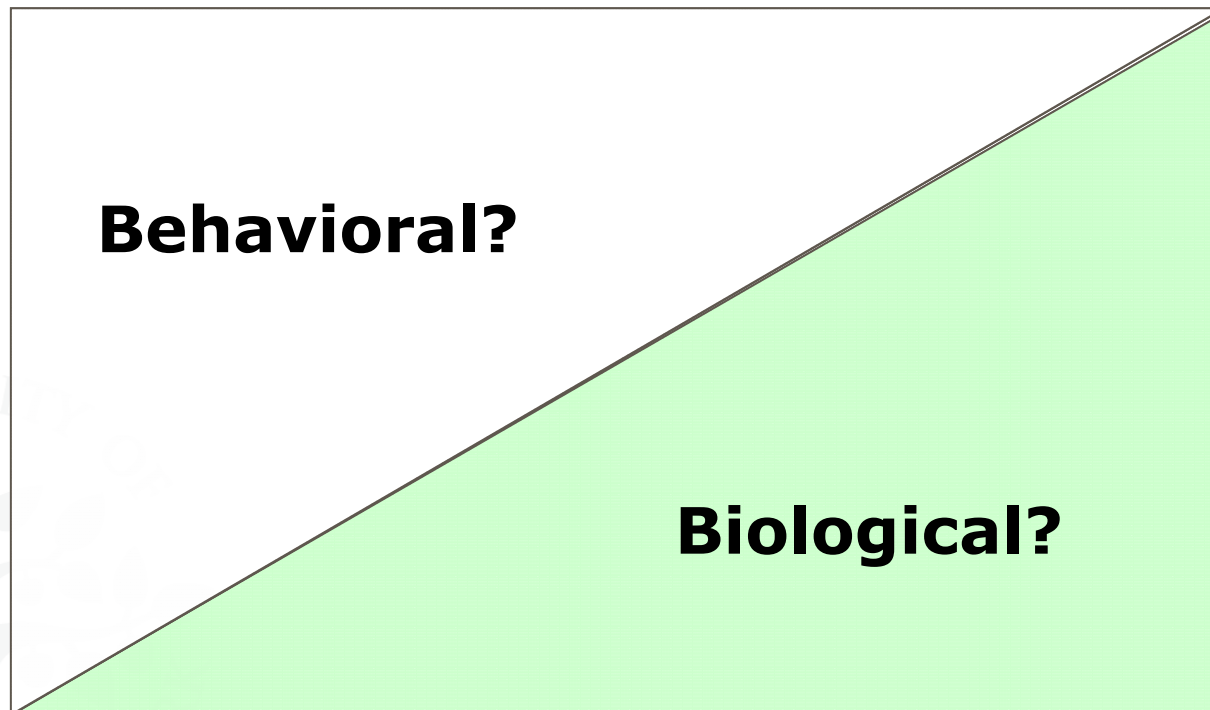
Female advantage in life expectancy at birth in 2006/7



* WHO; ** Human Mortality Database

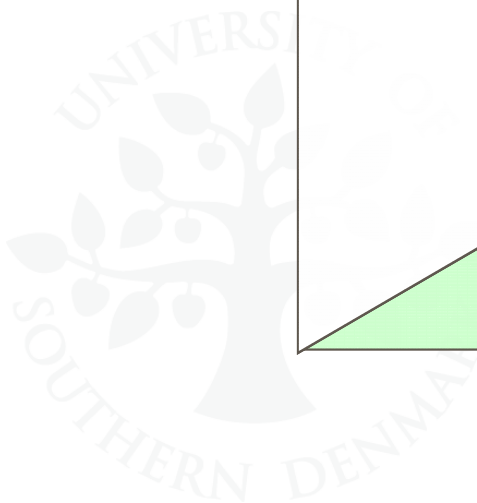
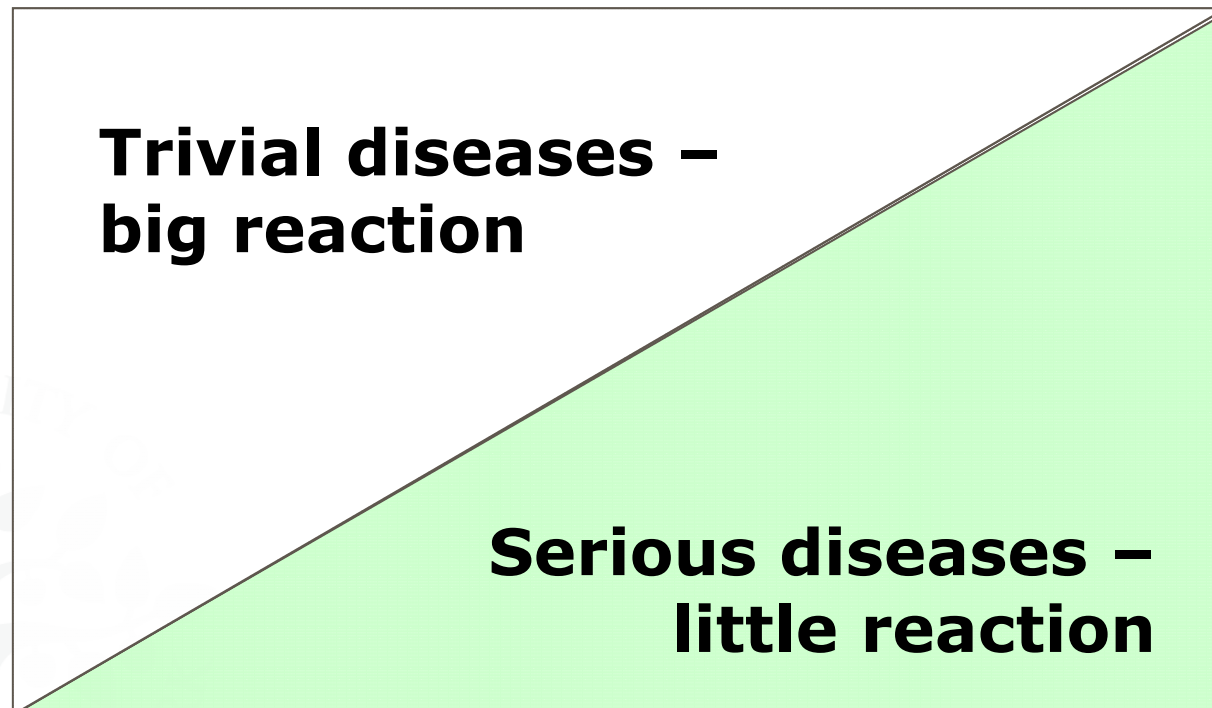


Male Excess Mortality



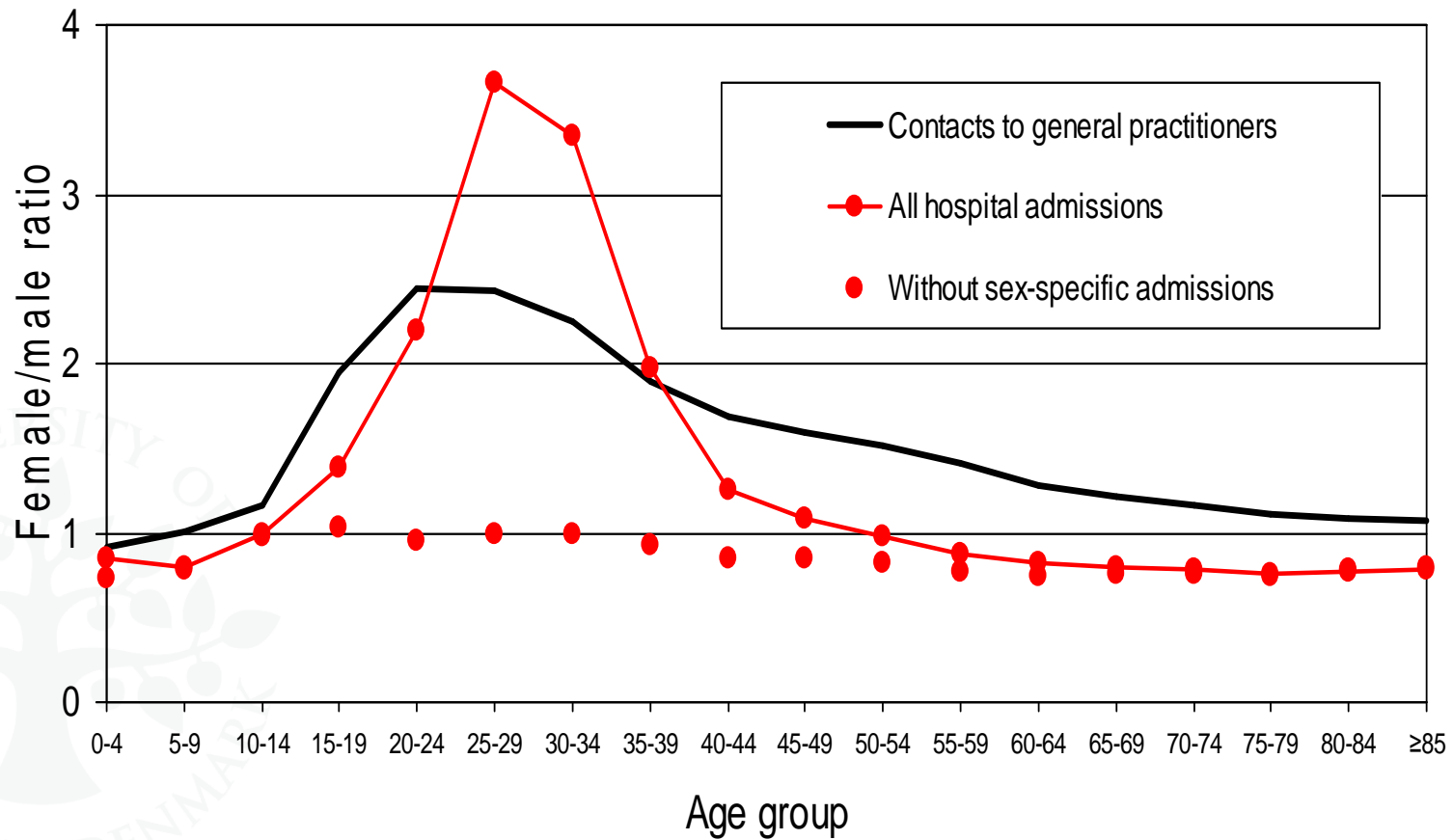


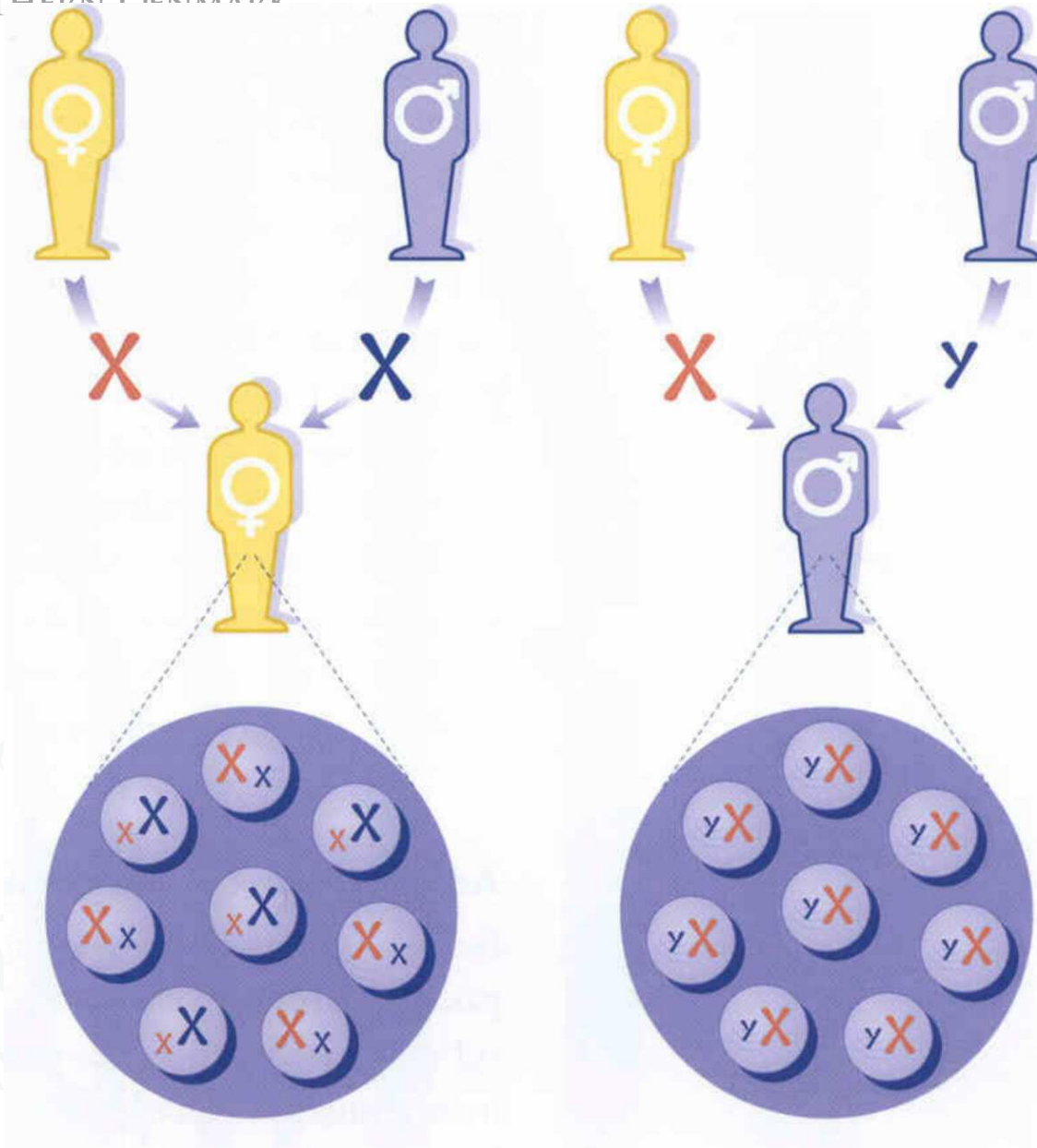
Are males seeking medical help too late?





Male health







MEN in Europe

Falling behind

- Biological barriers
- Behavioral barriers
- Cultural barriers