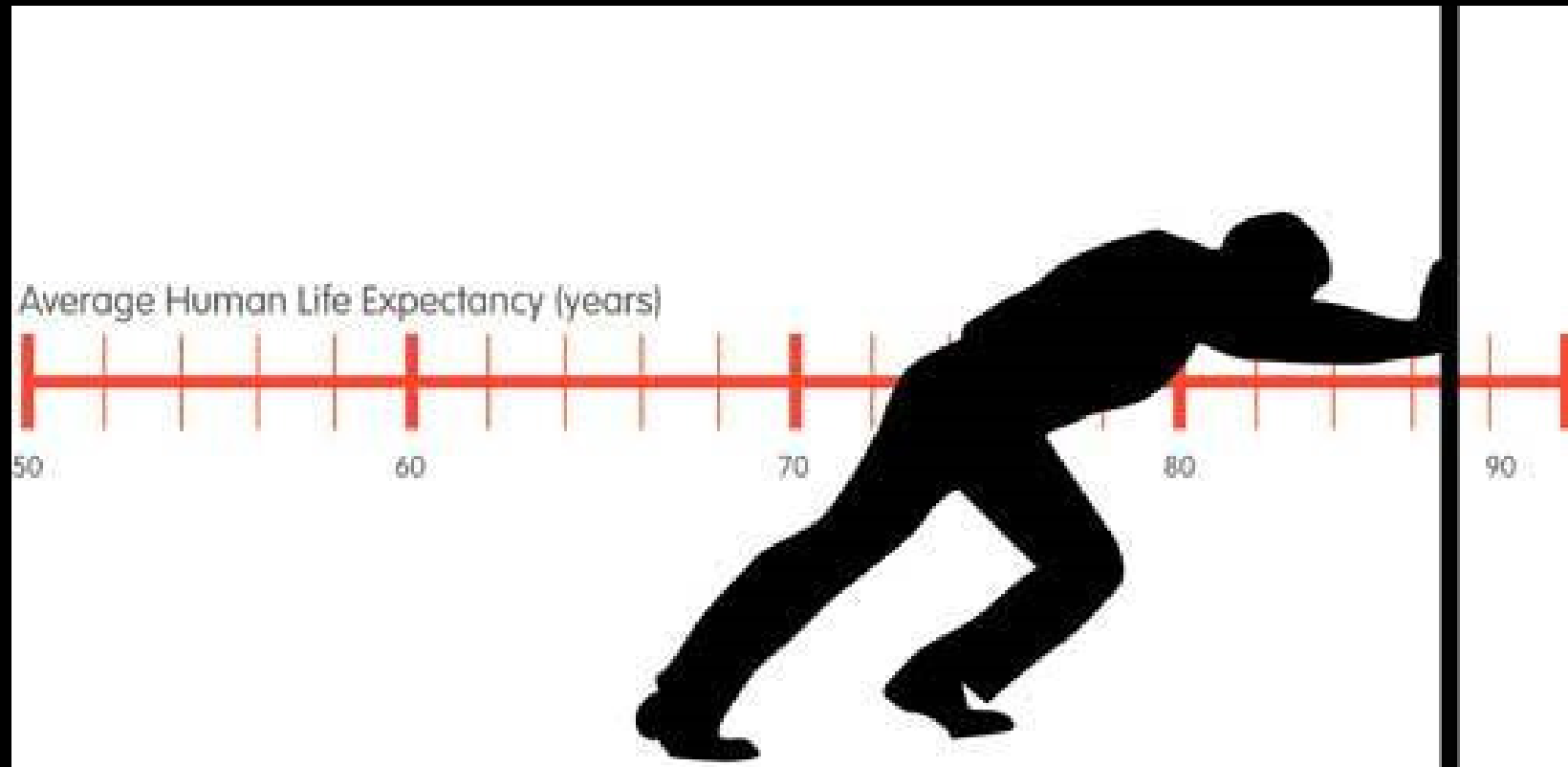


The Ethics of Life Extension



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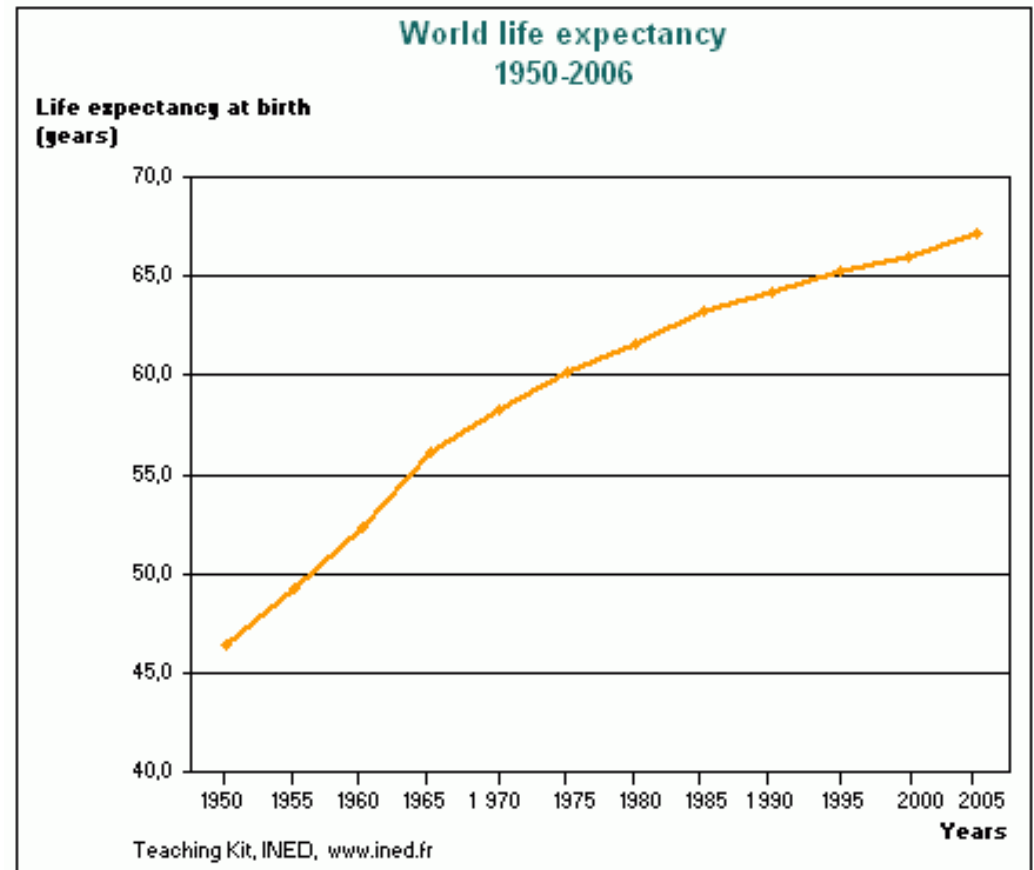
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Life Span is Already Extending

- Even controlling for the reduction of childhood mortality life expectancy has dramatically increased in this century



Life Extension Technologies

- Before Today:
 - Increasing education, development, equity
 - Public health to reduce infectious diseases, malnutrition, obesity

- But now:

- Significant anti-aging therapies soon

Snake Oil?

Scientific evidence for popular health supplements
Showing tangible health benefits when taken orally by an adult with a healthy diet



Aubrey de Grey's SENS

■ Solutions for seven key aging mechanisms

Aging Damage	Discovery	SENS Solution
Cell loss, tissue atrophy	1955	Stem cells and tissue engineering (RepleniSENS)
Nuclear [epi]mutations (only cancer matters)	1959	Removal of telomere-lengthening machinery (OncoSENS)
Mutant mitochondria	1972	Allotopic expression of 13 proteins (MitoSENS)
Death-resistant cells	1965	Targeted ablation (ApoptoSENS)
Tissue stiffening	1958	AGE-breaking molecules (GlycoSENS); tissue engineering
Extracellular aggregates	1907	Immunotherapeutic clearance (AmyloSENS)
Intracellular aggregates	1959	Novel lysosomal hydrolases (LysoSENS)

Long Life is a Blessing

- Why should there be any argument about the ethics of life extension?
- Few argue against medicine in principal
- The objections tend to come from social justice, virtue ethics, religious ethics, and ideas about the natural.

UC Scientists Discover Drug Makes Brains, Bodies Young Again

May 16, 2015 11:05 PM

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BERKELEY (CBS SF)— Imagine a drug that could make your aging mind and body young again. It [sounds](#) like the fountain of youth.

Researchers at UC Berkeley have [discovered](#) a small-molecule drug that does just that to the aging brains and muscles in older mice. They hope their findings will lead to a drug that does the same thing for humans.

Their findings were published in the journal [Oncotarget](#).

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My Ethics

- Millian rule utilitarian, but trending toward Sen/Nussbaum capabilities theory
- Utopian socialist advocate of the Enlightenment project
- Singerian non-anthropocentric personhood
- Buddhist/Parfitian denial of personal identity
- Neo-virtue theorist
- Teleological Buddho-transhumanist ideas of post-human apotheosis

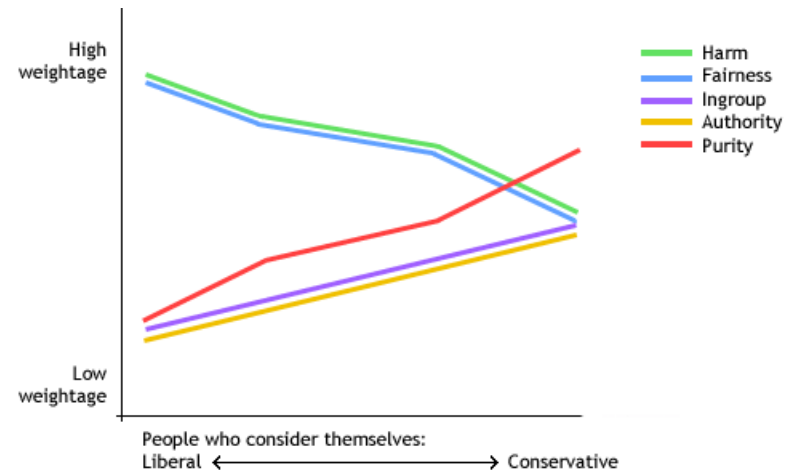
Haidt's Five Moral Intuitions

Liberals:

- Harm/care
- Fairness/reciprocity

Conservatives

- *Ingroup loyalty*
- *Respect for authority*
- *Purity/sanctity*



**Jonathan
Haidt**

Kass' Arguments for Mortality

Aristotleian Kass says mortality

- a) stimulates interest and engagement, leading to a greater personal happiness
- b) cultivates seriousness and aspiration; makes life matter
- c) encourages beauty and love; an acknowledgement of the transcendent, giving truth, beauty and love greater meaning
- d) develops character, virtue, and moral courage.



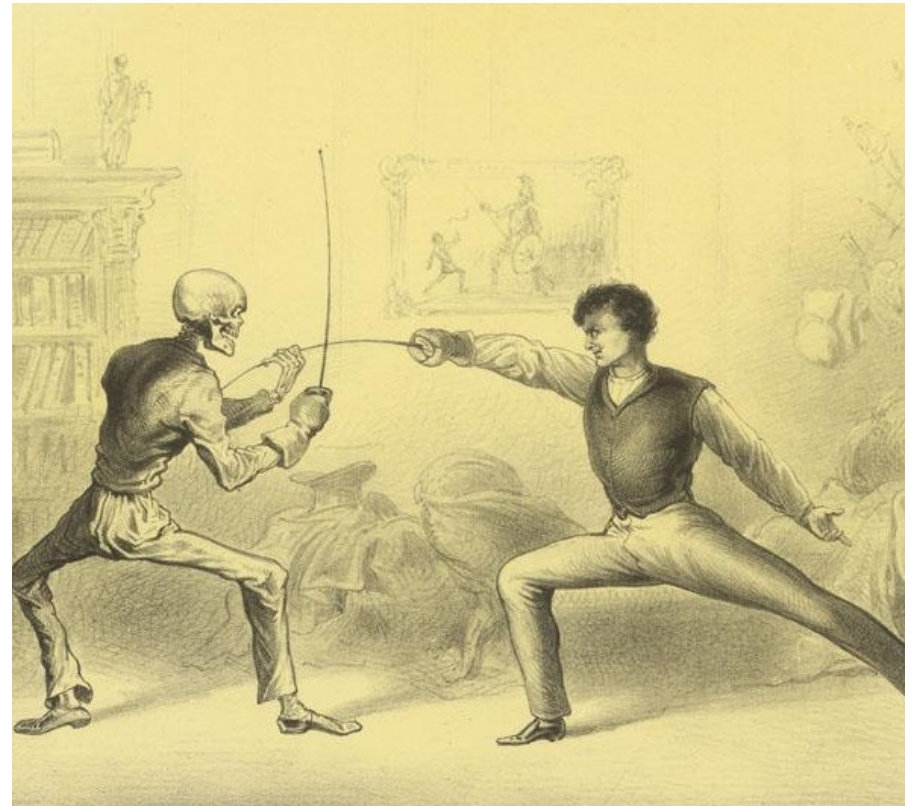
Arguments

- Will life extension produce more happiness, or other goods? (utilitarianism)
- Will it be fair? (equity)
- Does it violate the natural or divine order? (purity/sanctity)
- Will it enhance our virtue? (virtue theory)



Status Quo Bias

- Was life more meaningful, serious, virtuous, happy or engaged before the 20th century because of shorter lives?
- If longer lives are a curse why don't a lot 90 year-olds commit suicide today?



Sour Grapes

- People say they don't want radical life extension because they suffer from "Stockholm Syndrome": they see Death as inevitable and have decided to love him
- But valuing mortality as a virtue has outgrown its psychological utility
- Like martial valor from death in battle
- There is wisdom in embracing the inevitable, but not the preventable



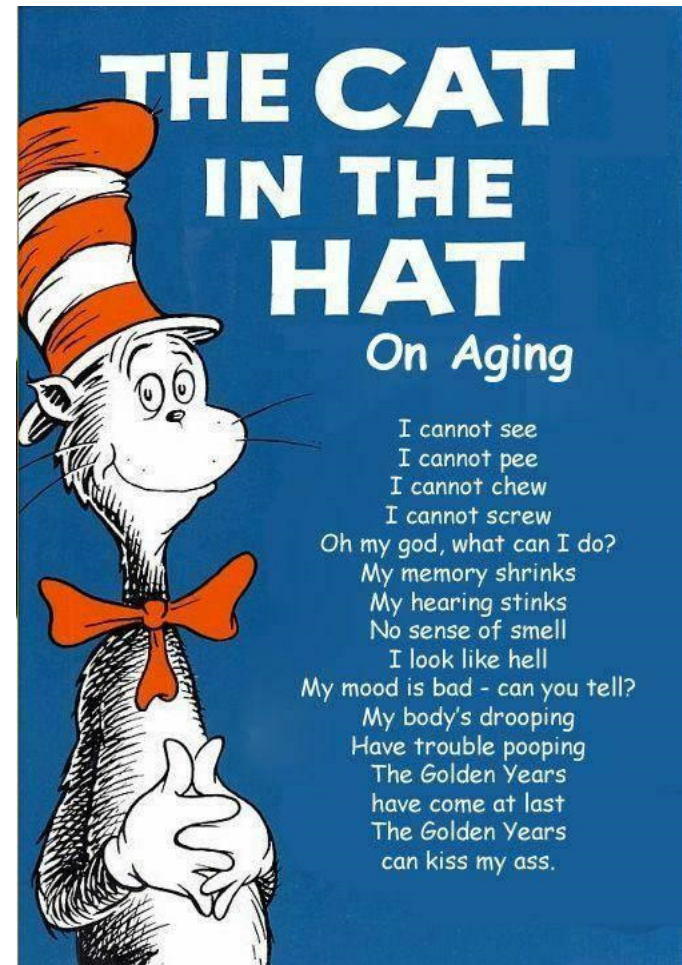
Will We Be Sicker?

- Tithonus fallacy
- Senior disability rates have been declining
- Significant anti-aging will extend healthy life expectancy
- Squaring the morbidity curve



Will We Be Happier?

- Healthy longevity enables and extends capacity for happiness
- Hedonic vs. Global Happiness
- Direct and indirect effects of older population on happiness



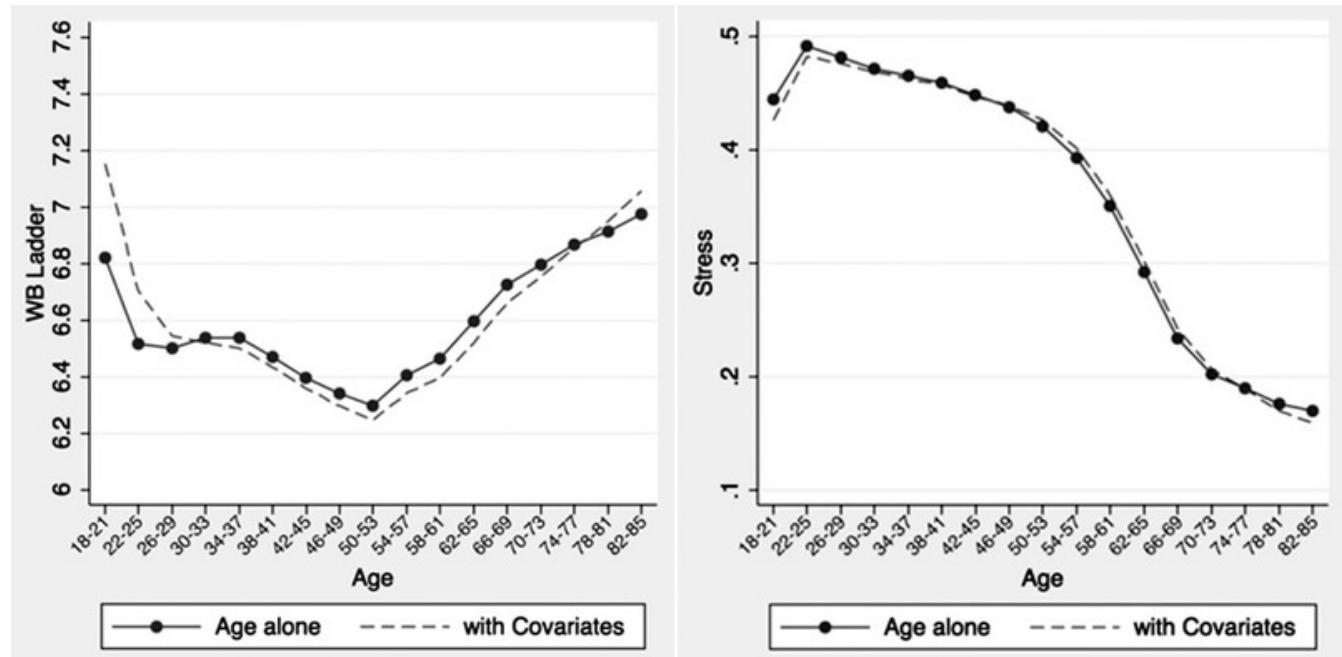
The Fear of Ennui

- Eighty years not enough to accomplish my life goals
- Healthy indefinite life expectancy vs. enforced sick, disabled immortality
- Right to end ones own life
- Developing goals appropriate to longer healthy lives



Age and Happiness

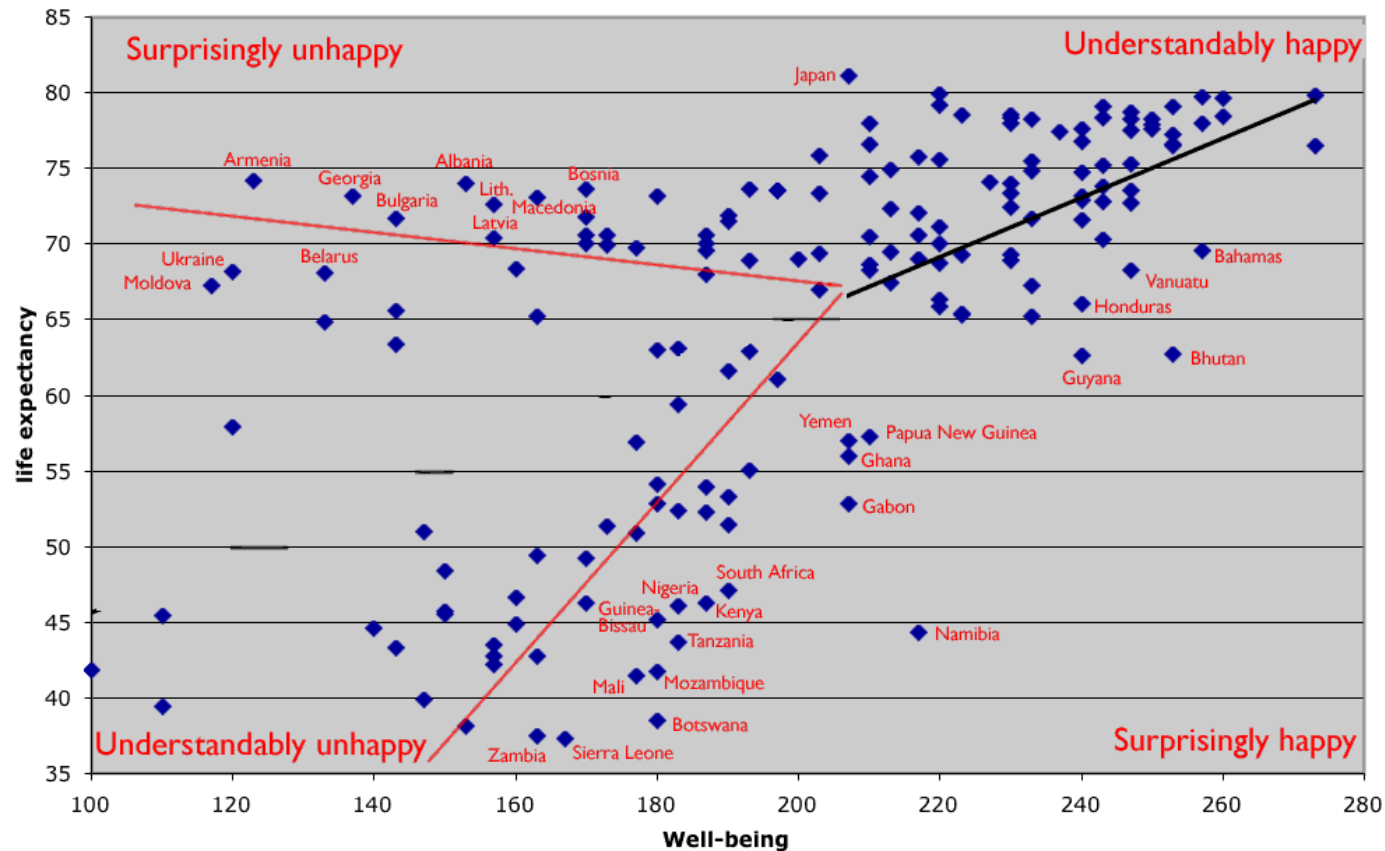
- Happy mood is lowest during child-rearing and continues to rise after 50
- Stress declines steadily from early adulthood



- N=340,847 people , Gallup Survey 2010. Stone et al. A snapshot of the age distribution of psychological well-being in the United States. *PNAS*

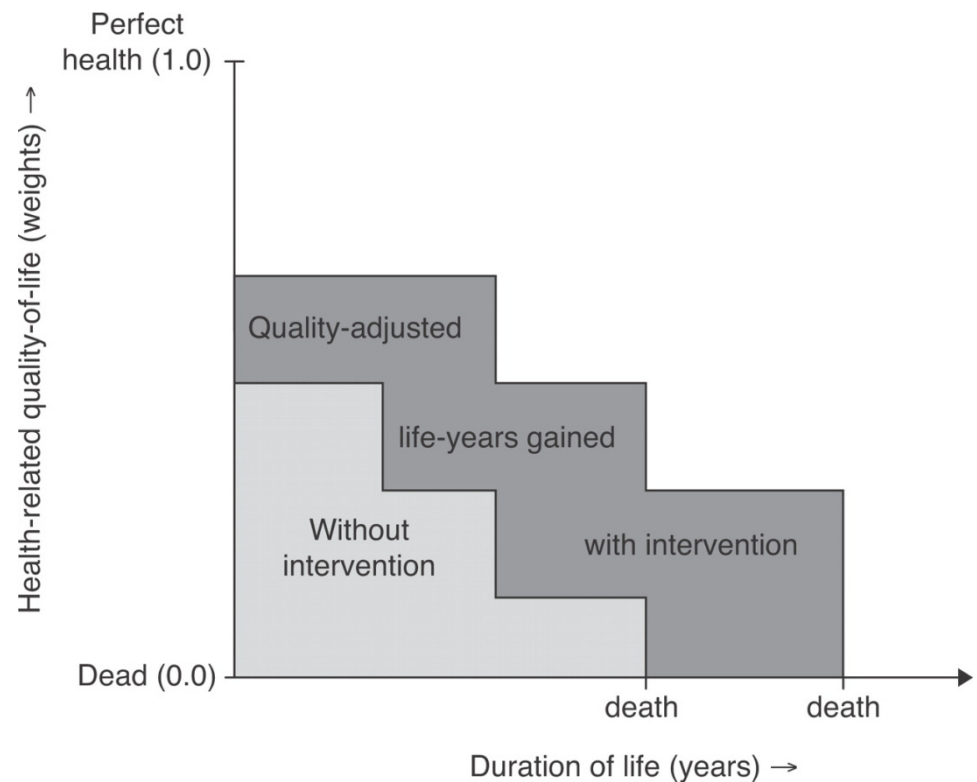
Longer-lived Countries Happier

- Except for Eastern Europe



Quality-Adjusted Life Years

- An attempt at utilitarian calculus in health-care priority-setting
- A year of healthy life = 1
- Applying QALYs would find almost any age-delaying therapy to provide a strong QALY/\$\$ return



QALYs and Life Extension

- Anti-aging therapies would dramatically extend quality *and* length of life compared to most therapies for illnesses



- And anti-aging therapies will probably compare well to many non-health public expenditures in QALYs/\$\$

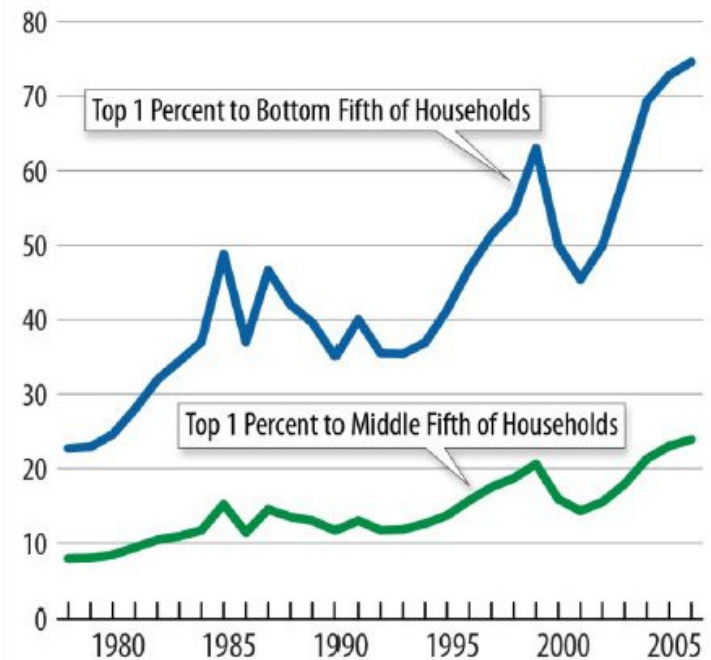
Equality

The effect of longevity therapies on equality depends on

- cost of the technologies
- universality of the health care system
- equality within societies
- economic progress in developing world
- support for access in developing world
- *not on life-extending tech*
- *Example: antiretrovirals*

Ratio of Top Incomes to Those of Middle and Bottom Have More Than Tripled Since 1979

Ratio of After-Tax Income, 1979-2007



Source: Congressional Budget Office, *Effective Federal Tax Rates: 1979-2007*, June 2010.

Intergenerational Justice

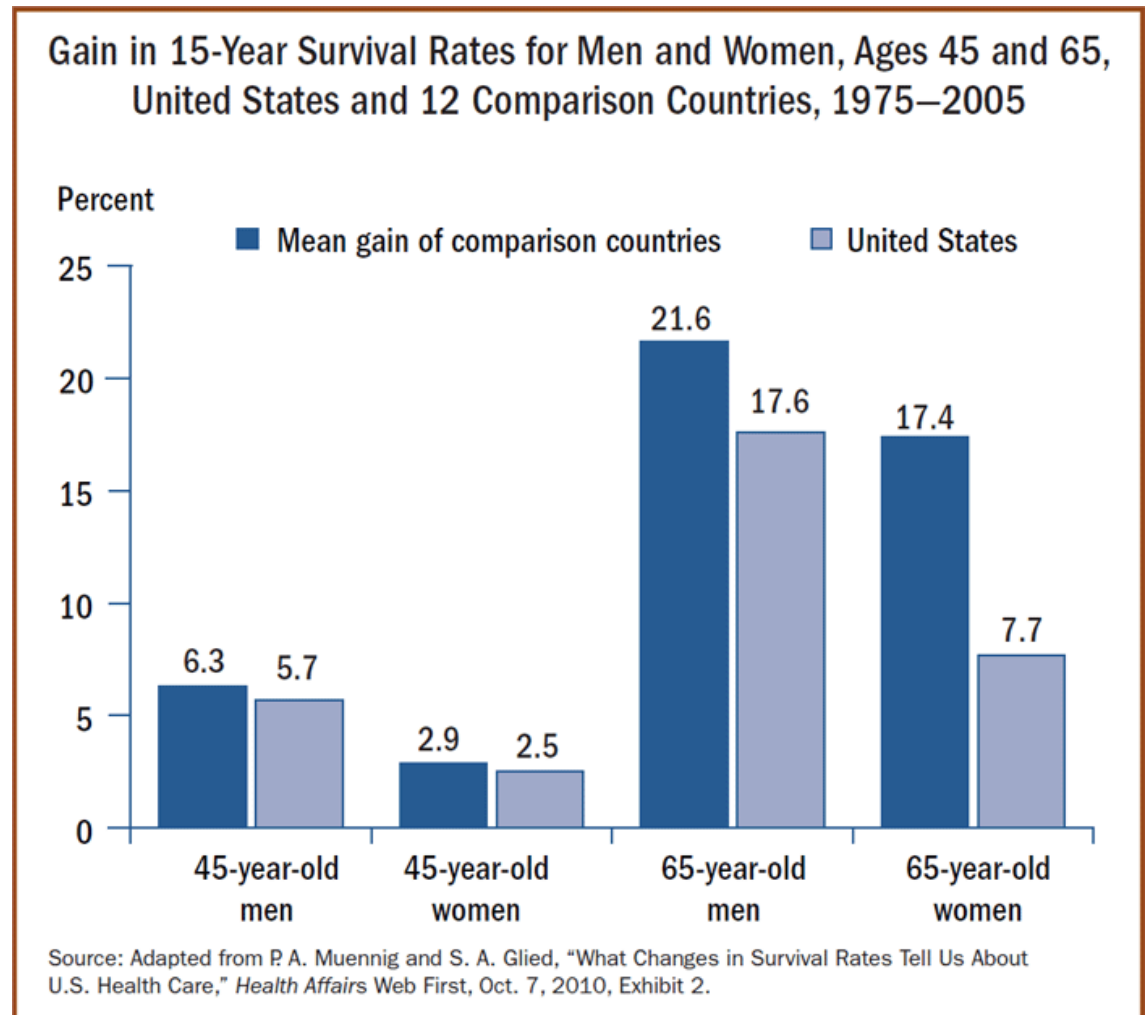
Graying societies will need to:

- Shift from retirement model to disability model of social insurance
- Facilitate transfers of wealth and career opportunities to the young



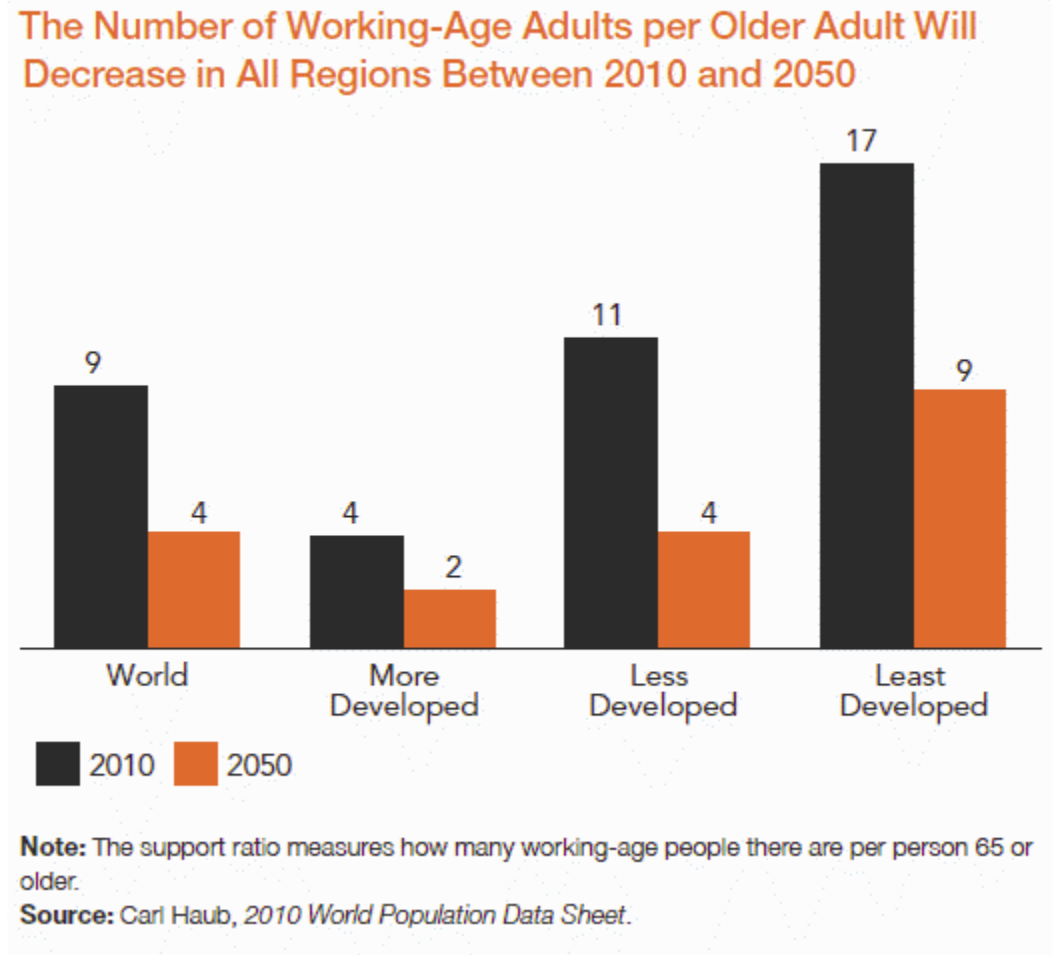
Health Care System

- The US is lagging in life expectancy gains because we do not have a universal health care system



Old-Age Dependency Ratio

- The growing ratio of older people to working age people will be crippling if the older people still get sick and disabled



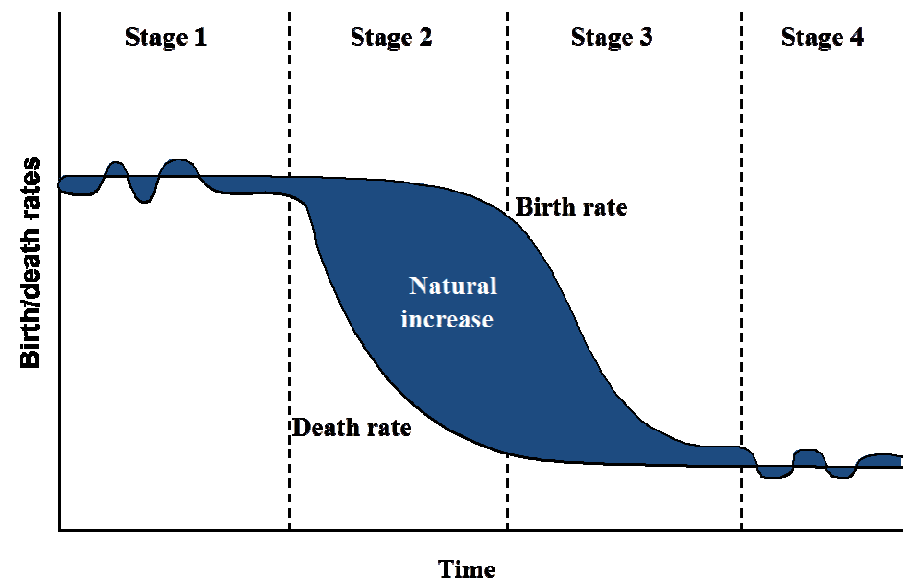
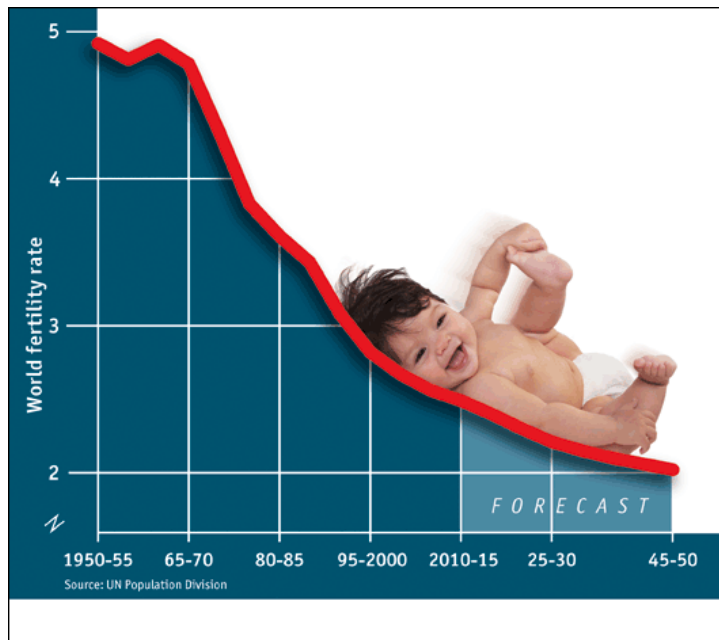
Longevity Dividend

- If anti-aging therapies can extend healthy longevity
- And older people stay in the labor force and out of nursing homes
- Net economic benefits



Overpopulation

- Most developed nations are shrinking
- Fertility is crashing for urban developing populations
- With current trends the global fertility rate will fall below replacement between 2020 and 2050
- Older populations will accelerate the birth dearth
- Even if there was population pressure would we really require that people die ?



Older People Are Greener

- Dalton et al. Population aging and future carbon emissions in the United States. *Energy Economics* 30 (2008) 642–675
- The current projections of population aging will reduce carbon emissions by 10%-40%
- Older people consume less stuff
- Longevity should also support more long-term thinking, deferred gratification



The Virtues of the Aged

- Temperance
Older people are less violent
- Compassion
Older people give more to charities even controlling for income
- Fairness
People grow more egalitarian and tolerant as they age
- Gratitude and Wisdom
Older people have more life experience, and are more grateful for what they have



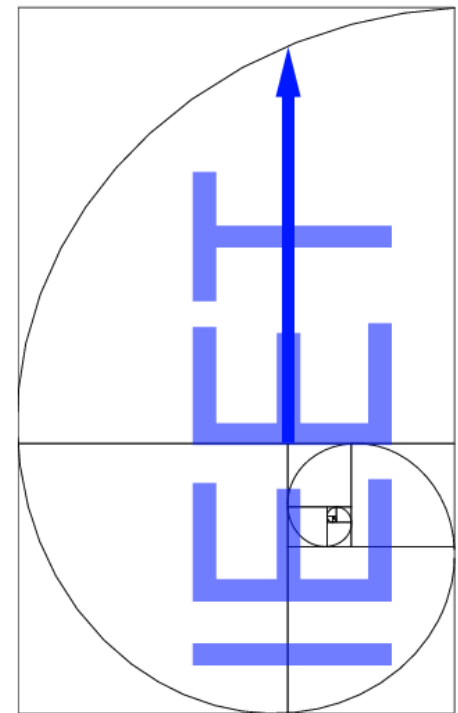
Wanting to live another day is not an unvirtuous motivation

Conclusions

- There will be technologies that extend *healthy* longevity by slowing or reversing aging
- But, yes...
- We need a more equal society and world
- We need a health-care system that guarantees universal access to safe life extending medicines
- We need to adjust social policies for intergenerational justice (basic income guarantee for all)
- *But life extension can be defended ethical on utilitarian and virtue grounds whether we achieve these reforms or not*

For more information

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