

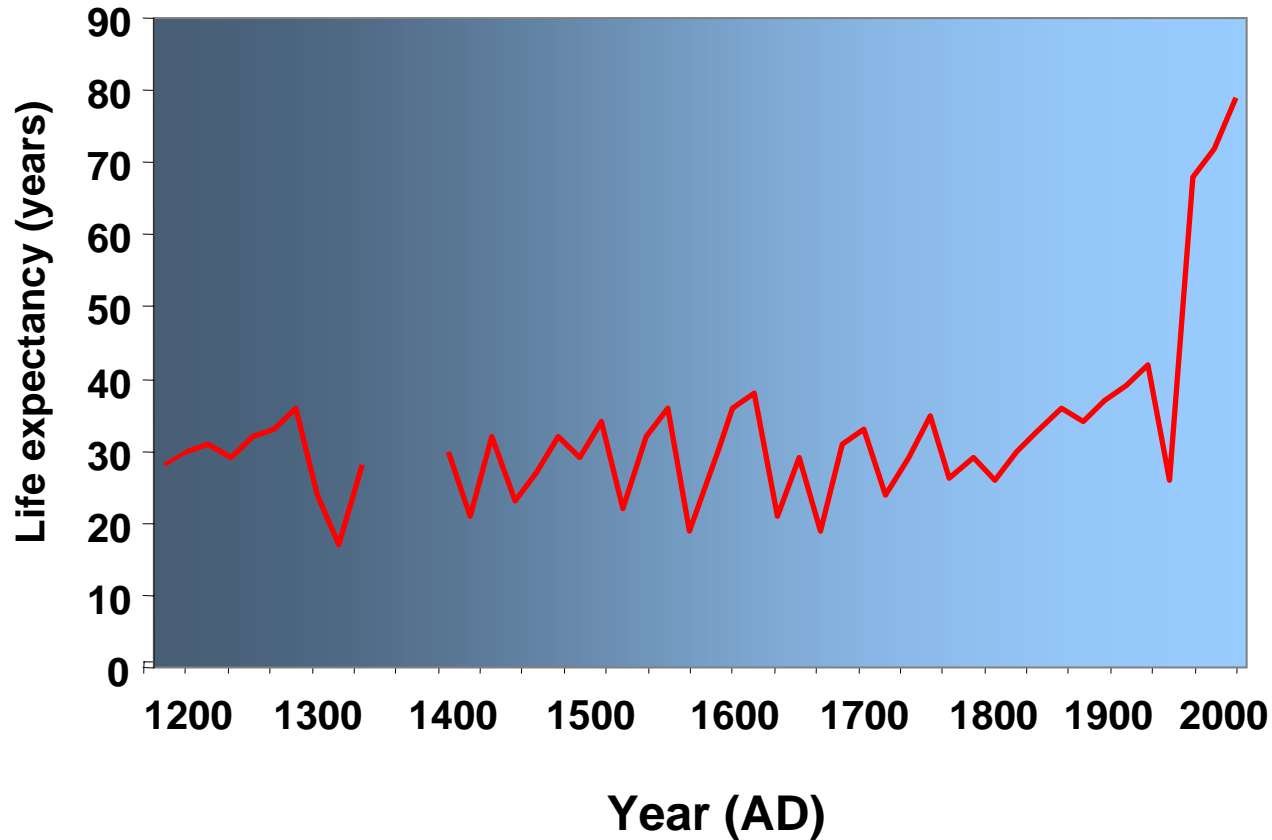
# Ageing: Is it all bad news?

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BBSRC-EPSRC SPARC Programme

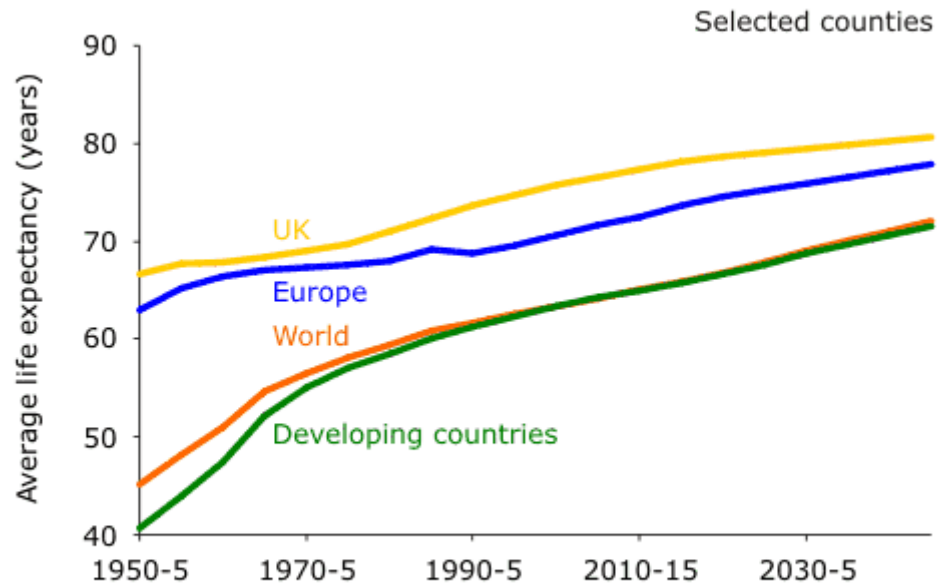
# The best place to start is the beginning

- In the beginning
- Life was very bad for most people most of the time
- Life was very short for most people most of the time
- Life expectancy is a good measure of whether things are getting better or not

# Life expectancy has increased markedly



# These trends are projected to continue



Source: United Nations Population Division

In 2050 about two billion people will be over the age of 65

## But...

- Growing older is associated with an increased chance of death (mortality)
- Growing older is associated with an increased period of time spent ill before death or recovery occurs (morbidity)
- Morbidity is a miserable and expensive condition to be in (currently costs £14-45 billion increasing to £30-65 billion by 2030)

These figures mask the diversity  
of the ageing population

Many older people live bleak lives

# Bored and depressed (9%)

## *Is life worth living?*

- Older, downmarket, DE 65+, widowed, live on own, rent
- In poor health
- Lonely and cut off, feel helpless
- Only group to use Social Services, Home Help, Meals on wheels etc
- Least likely to go out and be engaged with others / in activities
- Use anti-depressants, sleeping tablets, prescribed medicines
- Most likely to drink every day, and smoke
- Feel it is not worth getting up in the morning sometimes, struggle to fill their day
- Heaviest TV watchers

But many more do not

# Satisfied Innovators (17%)

## *No worries. What's new?*

- AB and 60-64, couples and empty nesters, own home outright
- In very good health and less likely to take supplements and medicines
- Most interested in change and keeping up to date
- Most likely to have stocks, shares, investments
- Very active socially, likely to do sport / exercise
- Most likely to be a member of a sports /golf club, or wine / investment club
- Most likely to use a computer and go on line, have technical equipment at home
- Most likely to go on holidays

Healthspan is the key to  
independence

# This is not a new observation



In Greek mythology, Tithonus was carried off by Aurora and was granted immortality by Zeus.

However, he had forgotten to ask for eternal youth and soon became so decrepit that he was kept in a basket.



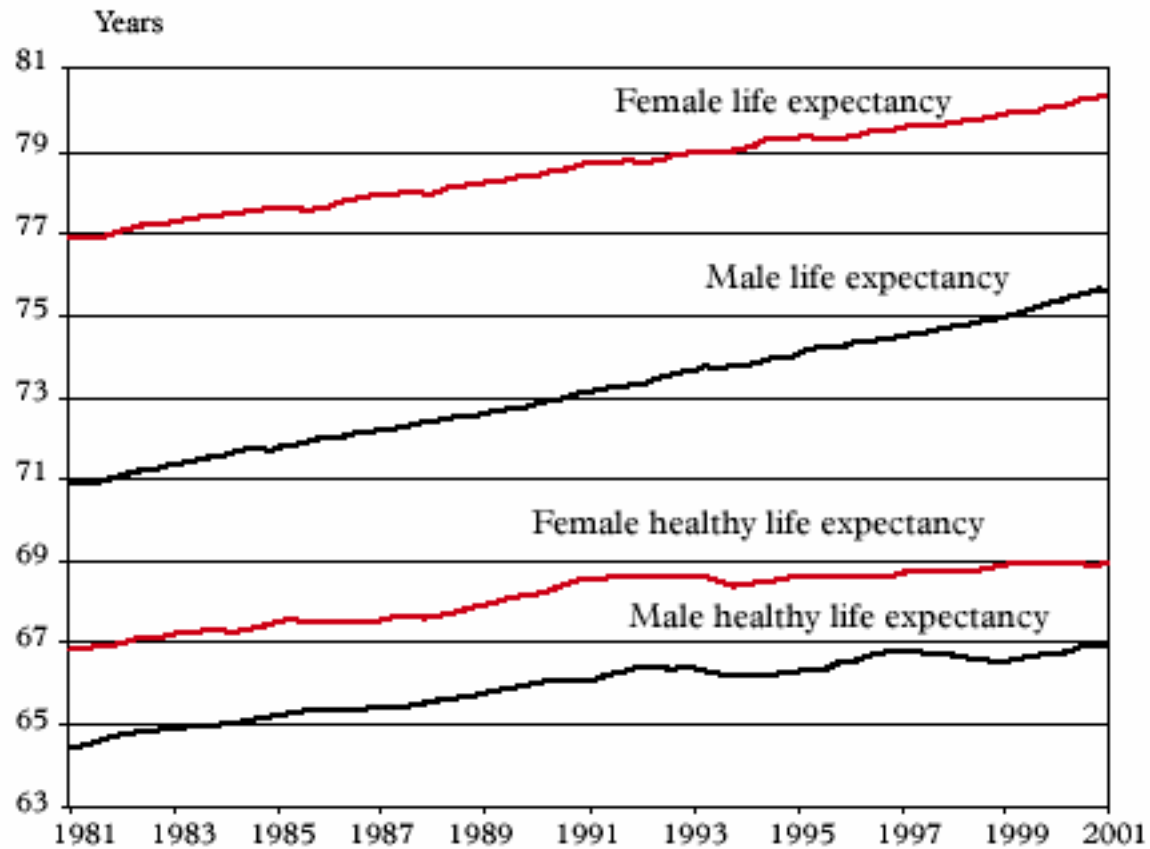
"At present aged-linked diseases are coming to account for well over half the clinical material in any Western medical practice."

"We are producing Tithonuses."

# Are we?

FIGURE 2

## Life Expectancy and Healthy Life Expectancy



# Confounding variables

- Data from the US **does** show a compression of morbidity
- Most survey data monitors self reported health
- **People** compare themselves to their peers
- **People** may gain financial advantages from being sick
- **People** use different definitions of sickness
- **People** are a **PROBLEM**

# Can studying the biology of ageing help?

- Can it help us understand how ageing happens?
- Can it help us understand what might happen to a population if ageing is slowed?
- Can it offer effective interventions into human ageing?

# YES!

The work which follows is funded by the  
BBSRC SAGE & ERA Programmes or the  
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EP**SR**C

Engineering and Physical Sciences  
Research Council

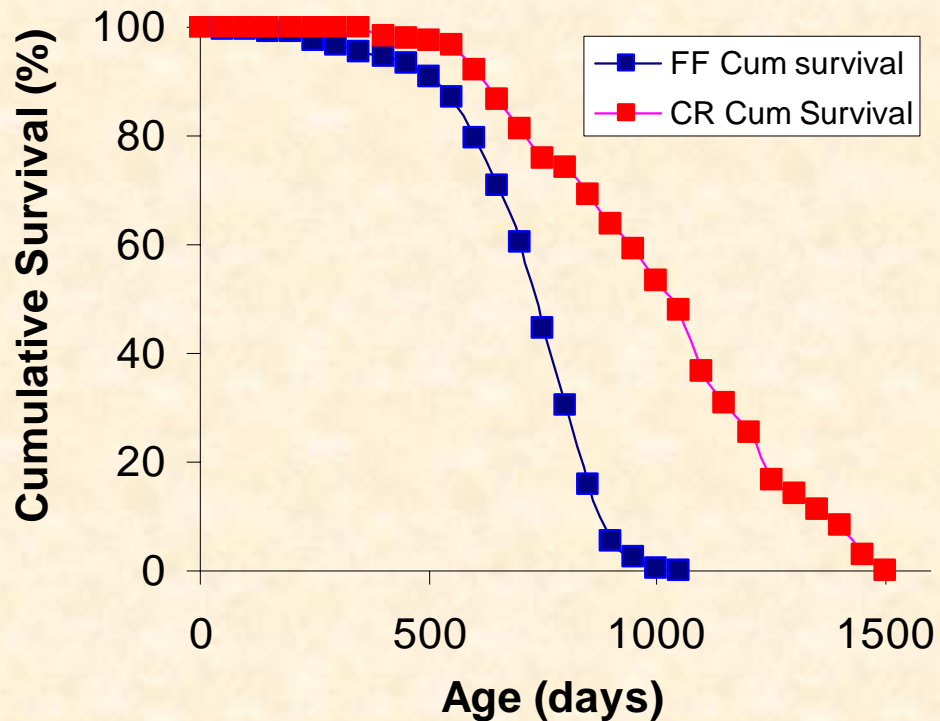


# Rats don't get sickness benefits!

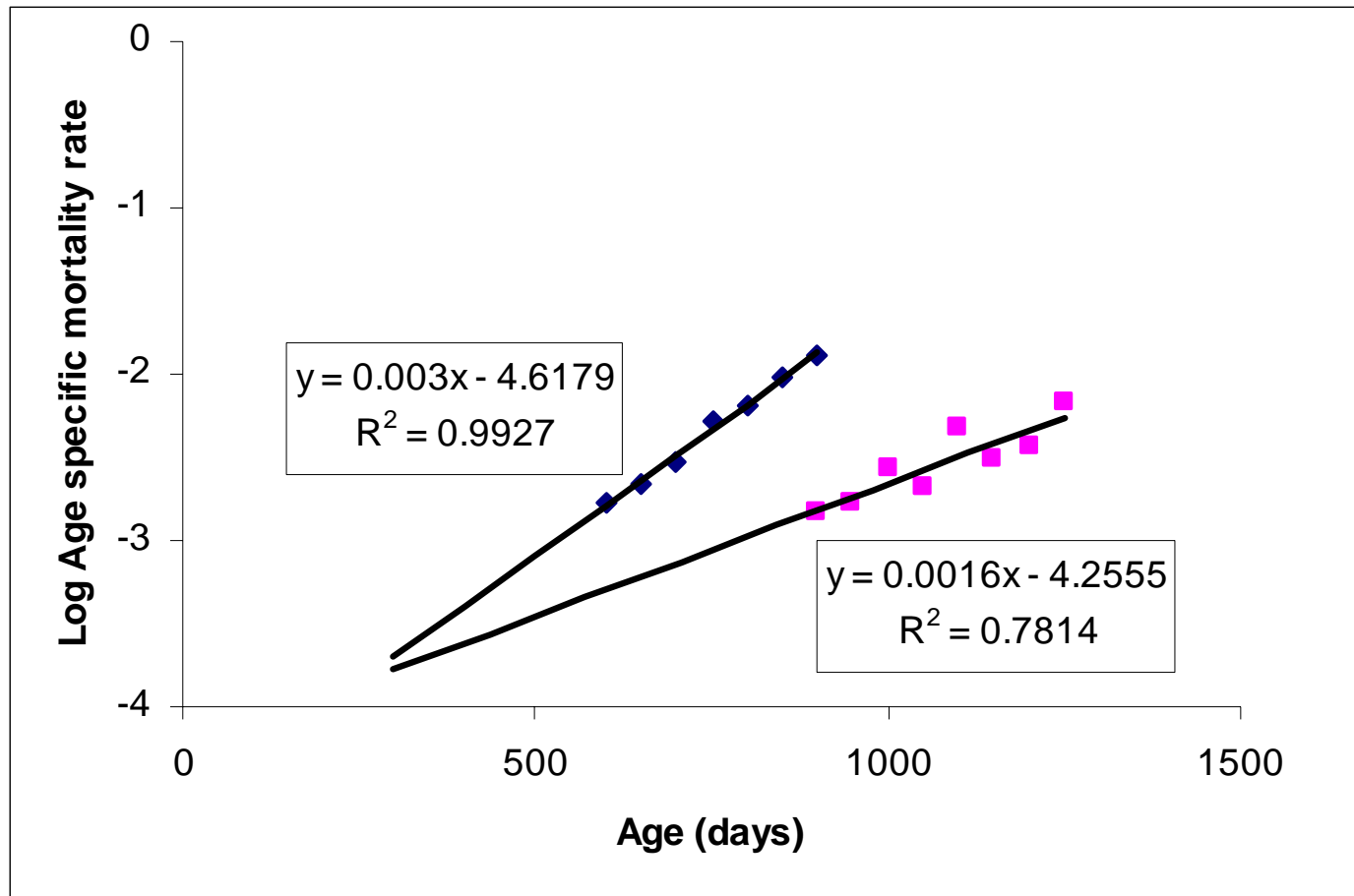


Retarded ageing in  
the Brown Norway  
Rat

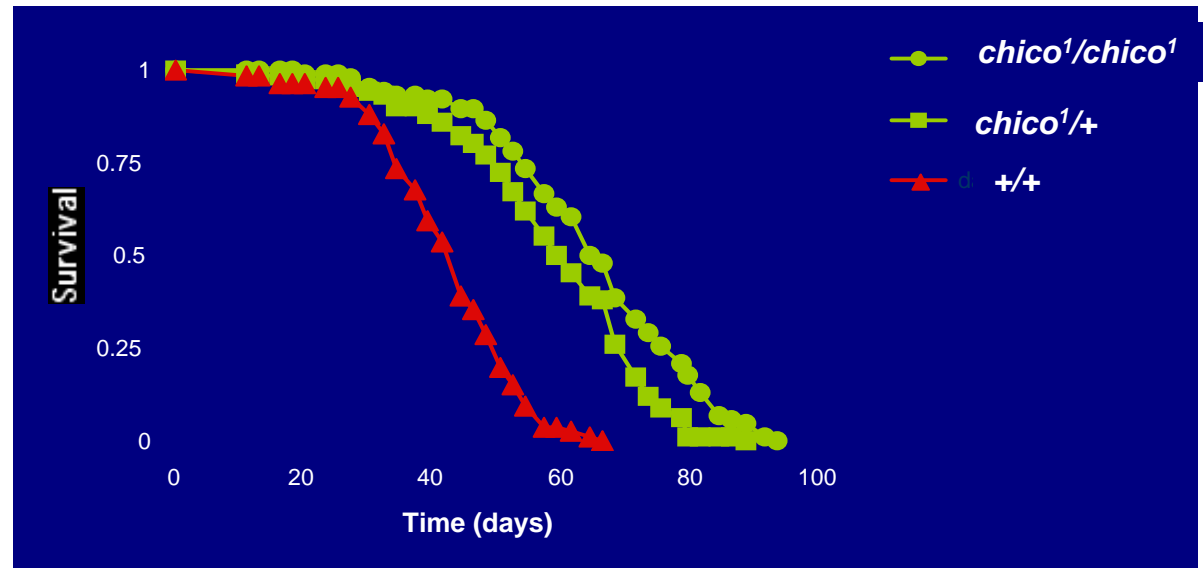
## Cumulative Survival Curves



# Age specific mortality can be altered by CR



# Mutations in insulin IGF1 can also alter the rate of ageing



Null mutation of *chico* (the fly insulin receptor substrate) extends lifespan

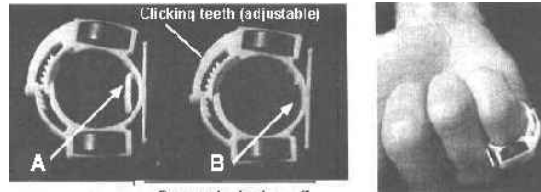
# Altering the rate of ageing:

- Decreases the rate at which pathologies appear  
reduces their severity once they do appear
- Produces an effective compression of morbidity
- If this happens in humans we may well spend less money on care, promote independence and get happier older people

# Ageing hasn't been 'cured' yet

- One of our jobs today is to put you in your guard against people who say it has...
- Some people say it by accident
- Some people say it out of misplaced enthusiasm
- Some people say it to make money

# Some people...



*Alex Chui*

Inventor of the Immortality Device,  
on sale at [www.alexchiu.com](http://www.alexchiu.com)

*"If you are not satisfied with the results brought by the Immortality Devices we can refund your money back within 90 days."*

Want to know more?

[www.sparc.ac.uk](http://www.sparc.ac.uk)