



Session 037 - Pension Section Luncheon: Living to 100 - Genetics & Aging

Moderator:

Andrew J. Peterson, FSA, EA, FCA, MAAA

Presenter:

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2017 SOA Annual Meeting & Exhibit

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Session 37, Living to 100 - Genetics & Aging

October 16, 2017



National Institute
On Aging



Outline



- I. Briefly, current demography of age groups 100-104, 105-109 and 110+ and why the younger of these age groups continues to grow in number but the oldest (supercentenarians), not so much
- II. Determinants of survival for these age groups and the increasing genetic influence with increasing age
- III. The proportion of the population at increased "risk" for survival to these age groups (they are very different!)
- IV. Variables and demographic characteristics affecting such risks.

Our Studies



National Institute
On Aging

550 long lived families
4,900 family members



The 8 Hurlburt siblings, ages 79-96 years



2,500 centenarians (100-119 years)
500 offspring (63-100 years)
150 supercentenarians (110+ years)



Exceptional longevity - to live 30-40 years past the median survival of the 1900 birth year cohort



"The film swells with poignancy, wisdom and humour"



OLDER THAN IRELAND



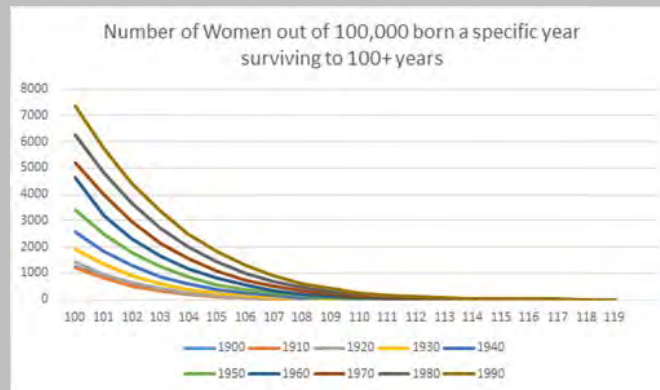
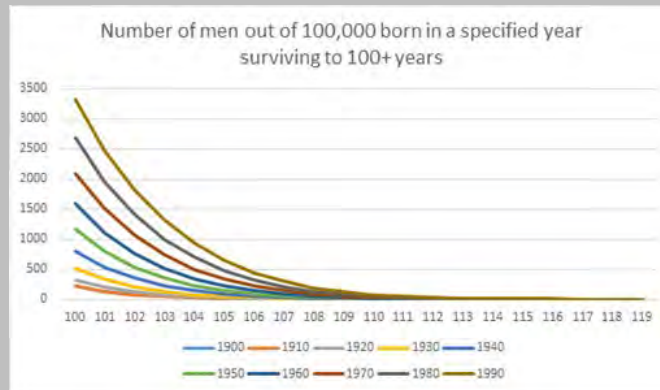
~67 years
Median survival

~92 years
5% survival

~100 years
0.2% survival

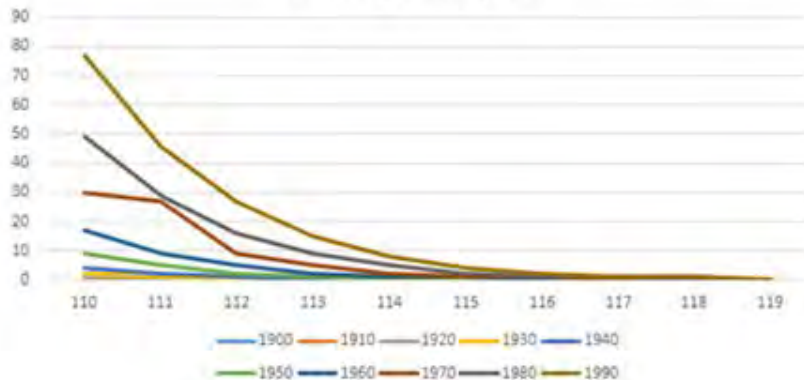


Birth-cohort-specific rate centenarian rate for ages 100-119

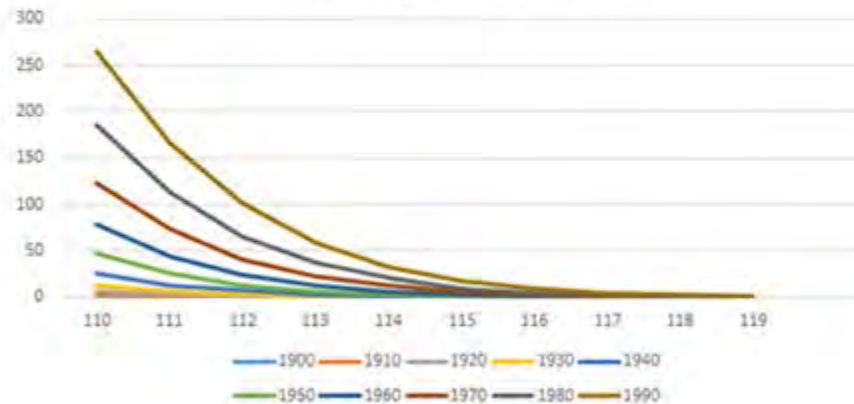


Birth-cohort specific centenarian rate for ages 110+ (“super-centenarians”)

Number of men out of 100,000 born in a specified year surviving to 110+ years



Number of Women out of 100,000 born a specific year surviving to 110+ years



A remarkable “supercentenarian”



Madame Calment



Madame Calment – age 122



age 116



Sarah Knauss – age 119



Sarah Knauss – at age 99





The survivors: onset of disease before the age of 80

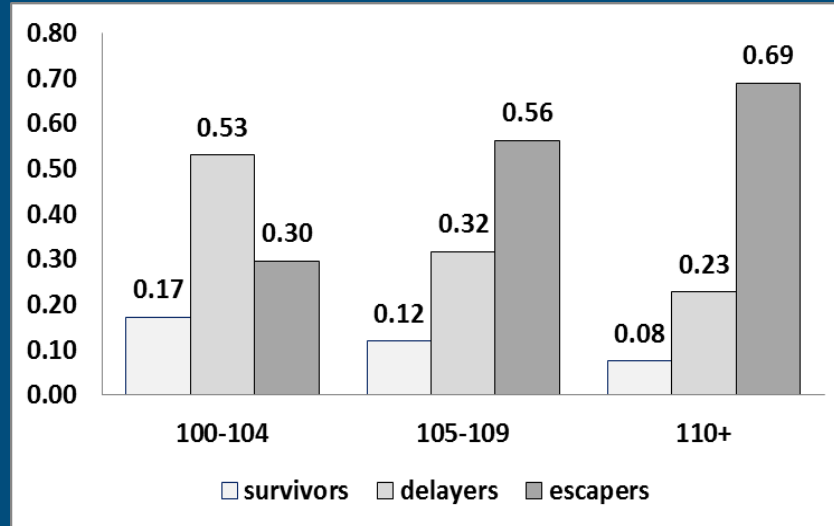


The delayers: onset of disease at or beyond the age of 80



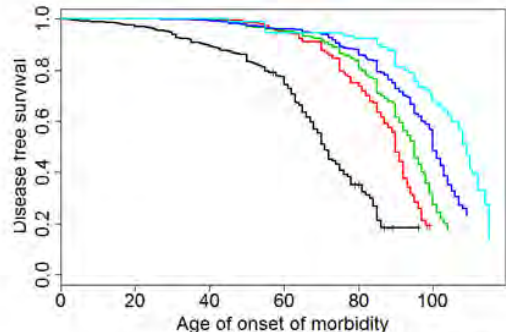
The escapers: reach 100 without the onset of disease

Survivors, Delayers, Escapers



Diseases included in this analysis were: cancer, cardiovascular disease, COPD, dementia, diabetes, and stroke.

Compression of Morbidity

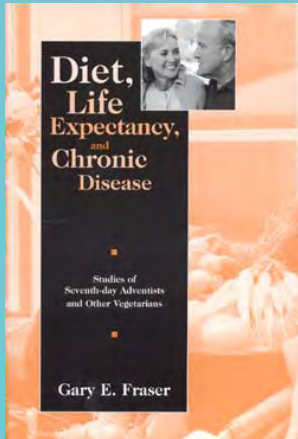


Diseases in this analysis were:
cancer, cardiovascular disease,
COPD, dementia, diabetes, and
stroke.

Compressed Morbidity

| | Est | 95% CI |
|-------|-------|--------------|
| Cont | 17.90 | 12.95; 24.65 |
| Nonag | 9.39 | 7.60; 11.61 |
| Cent | 8.97 | 8.00; 10.06 |
| Semi | 8.85 | 7.54; 10.39 |
| Super | 5.22 | 3.74; 7.32 |

What can we achieve on average?



AGEING

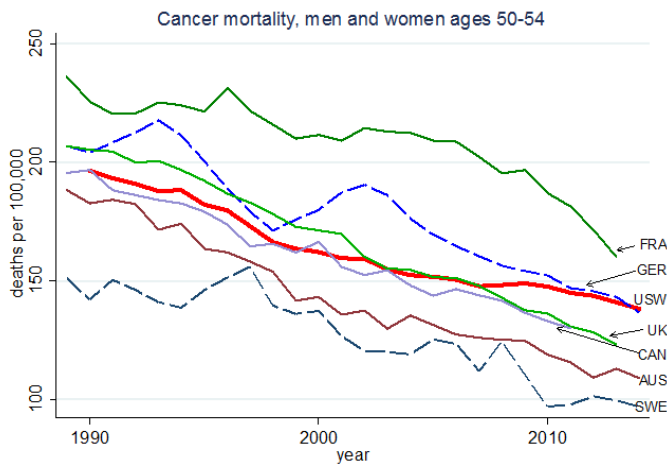
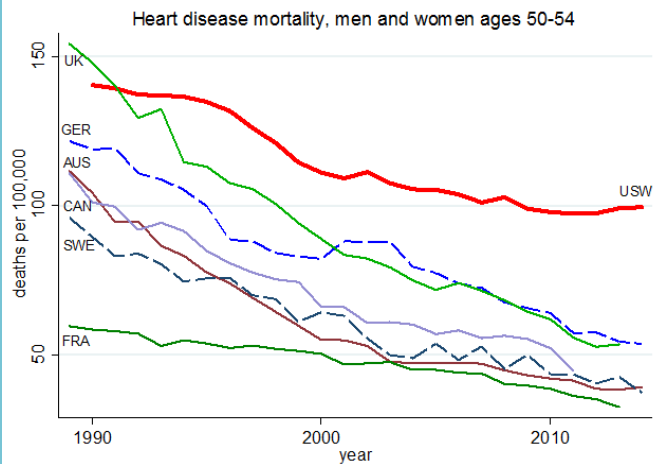
- A
 - G
 - E
 - I
 - N
 - G
- Attitude
Genetics
Exercise
Interests
Nutrition
Get rid of (smoking & anti-aging quackery)



Heart disease and cancer mortality are falling

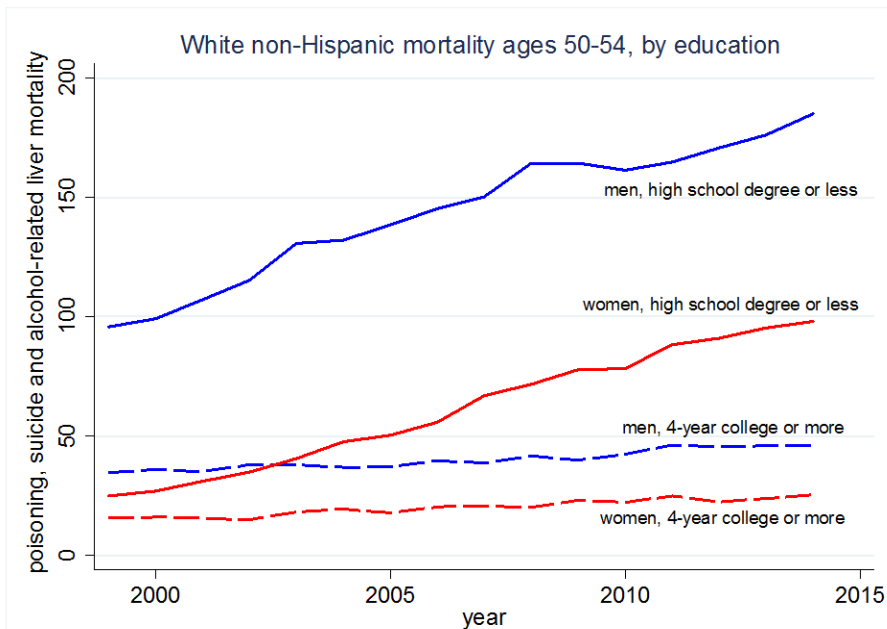
Figure 1.8

Heart disease and cancer mortality, ages 50-54, US white non-Hispanics and comparison countries



A disturbing trend however...

Figure 1.11 Drug, alcohol and suicide mortality



What should we achieve on average?

A Spectrum



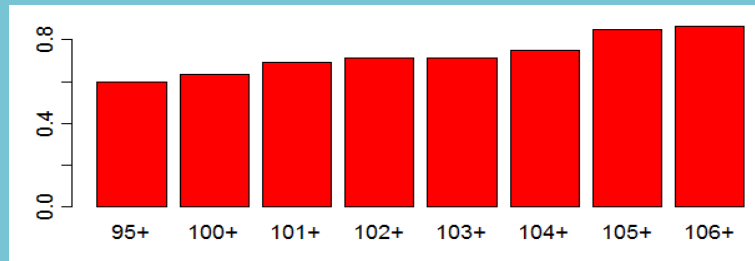
Nurture wins, to a point...

- 70% environmental, 30% genetic to reach mid to late 80's
- Evidence for an increasing genetic component for older ages:
 - Familial clustering
 - Siblings with markedly increased relative probabilities of living to 100+
 - Offspring with marked decreased risks for age related diseases such as heart disease, stroke, diabetes, cancer
 - Power to discover genetic variants associated with exceptional longevity increases with age
- What kind of genetic variants? Disease vs. Protective



Genetic Signatures

Trend of Sensitivity



Approximately 60% sensitivity
to correctly classify who lives
to age 95+

Approximately 85%
sensitivity to correctly
classify who lives to age
106+

LIVING TO 100

TAKE THE CALCULATOR

CONTACT DR PERLS

ABOUT THE CALCULATOR

LINKS



Expanded from the groundbreaking book Living to 100.

Life Expectancy Calculator

The Living to 100 Life Expectancy Calculator uses the most current and carefully researched medical and scientific data in order to estimate how old you will live to be. Most people score in their late eighties... how about you?

The calculator asks you 40 quick questions related to your health and family history, and takes about 10 minutes to complete.



Thomas Perls
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TAKE THE CALCULATOR

In addition you will receive:

- Personalized feedback for each of your answers
- A Personalized "To-Do" list for you and your physician
- A list of things you can do differently and how many years you will add if you do so
- The option to sign up to take the calculator track of your answers and see if your calculator is better or worse. We will send you a year

Thanks for providing this interesting site — it's good to know how one is getting on! I am going to suggest that my husband does the questionnaire — it might frighten him into giving smoking up, and my daughter might be encouraged to stop her bad eating habits!

I.M.

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- 40 Questions
- 7 Minutes
- Personalized feedback to help you live longer

www.livingto100.com



[USA WEEKEND Magazine](#)

Anti-Aging Medicine=Quackery





THANK YOU
Questions?



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