Leading causes of illness and death today

- heart disease
- stroke
- Alzheimer’s
cancer
- diabetes
- kidney disease
disability/frailty
etc…
The aging world...

2015

2050

>20% over age 65
The “Silver Tsunami”

...and the problem:

heart disease
stroke
Alzheimer’s
cancer
diabetes
kidney disease
disability/frailty
etc…

+ =

The “Silver Tsunami”
Possible solution: increase *healthspan*
Possible solution: increase *healthspan*

- heart disease
- stroke
- Alzheimer's
- cancer
- diabetes
- kidney disease
- disability/frailty
- etc…

Johanna Quaas, age 94
A framework for studying healthspan
One research example:

- impaired protein homeostasis
- mitochondrial dysfunction
- telomere attrition
- ROS (reactive oxygen species)
- oxidative stress
- dysregulated energy sensing
- genomic instability
- epigenetic modifications
- reduced stress resistance
- cellular senescence
- stem cell exhaustion
- inflammation
One research example:

- 2% protein-coding
- >50% repetitive "junk"

- Mitochondrial dysfunction
- Oxidative stress
- Inflammation
- Epigenetic modifications
- Telomere attrition
- Stem cell exhaustion
- Dysregulated energy sensing
- Reduced stress resistance
- Impaired protein homeostasis
- Genomic instability
- Cellular senescence
Healthspan-focused, translational approach:
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Ultimate goal: **optimal** (precision?) **longevity**