Universidad del País Vasco

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Decomposing differences in multistate indices: Compositional reflections

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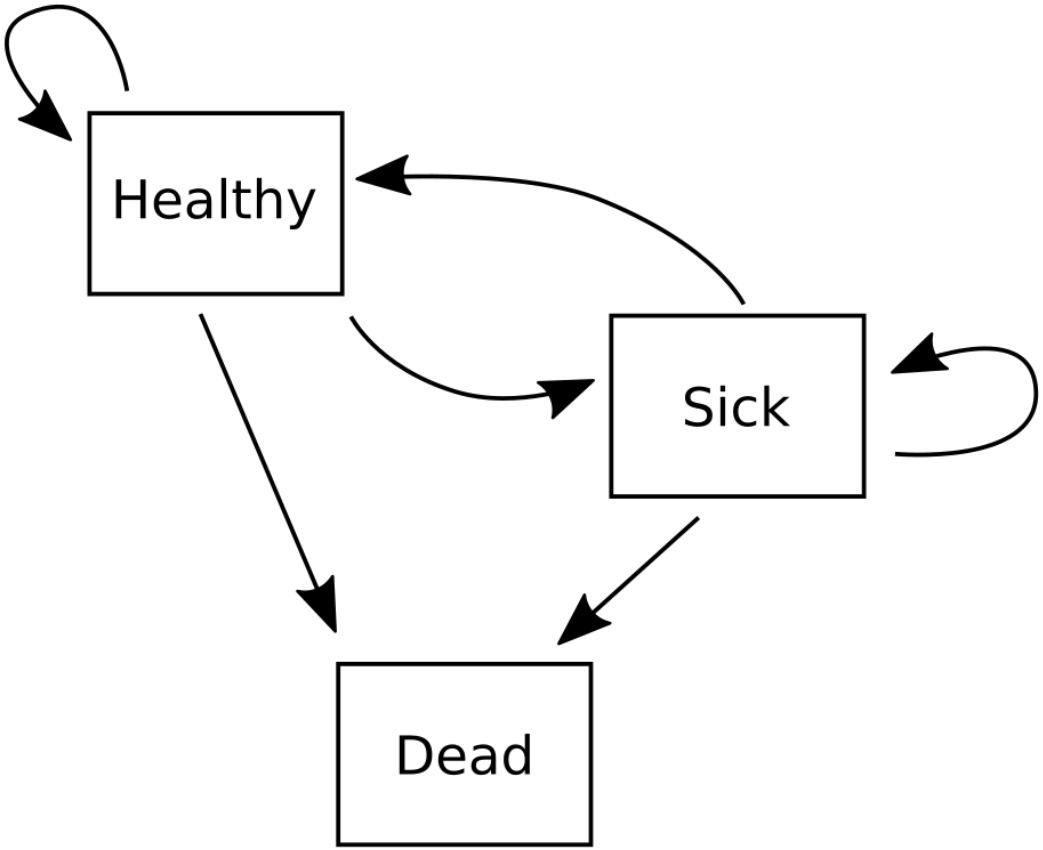
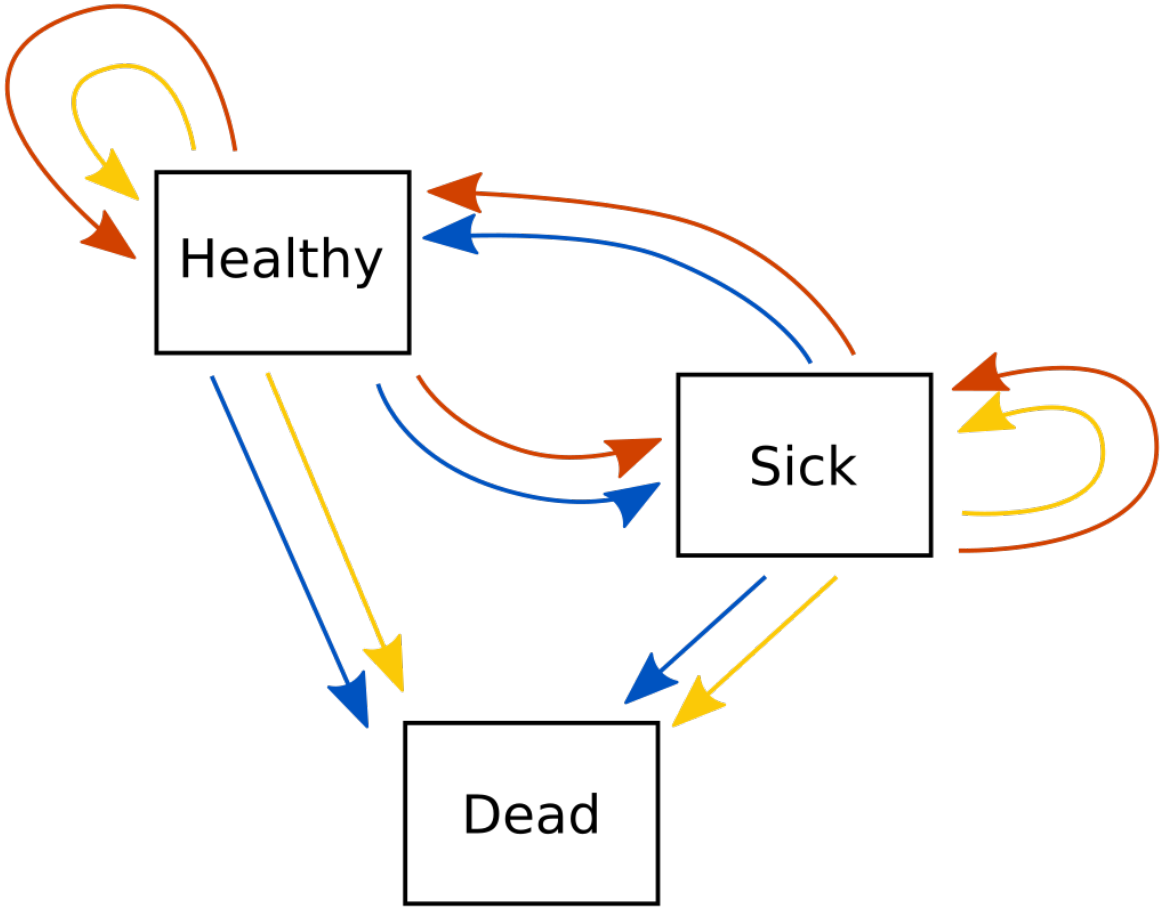
Climbing Mortality Workshop

A typical multistate model



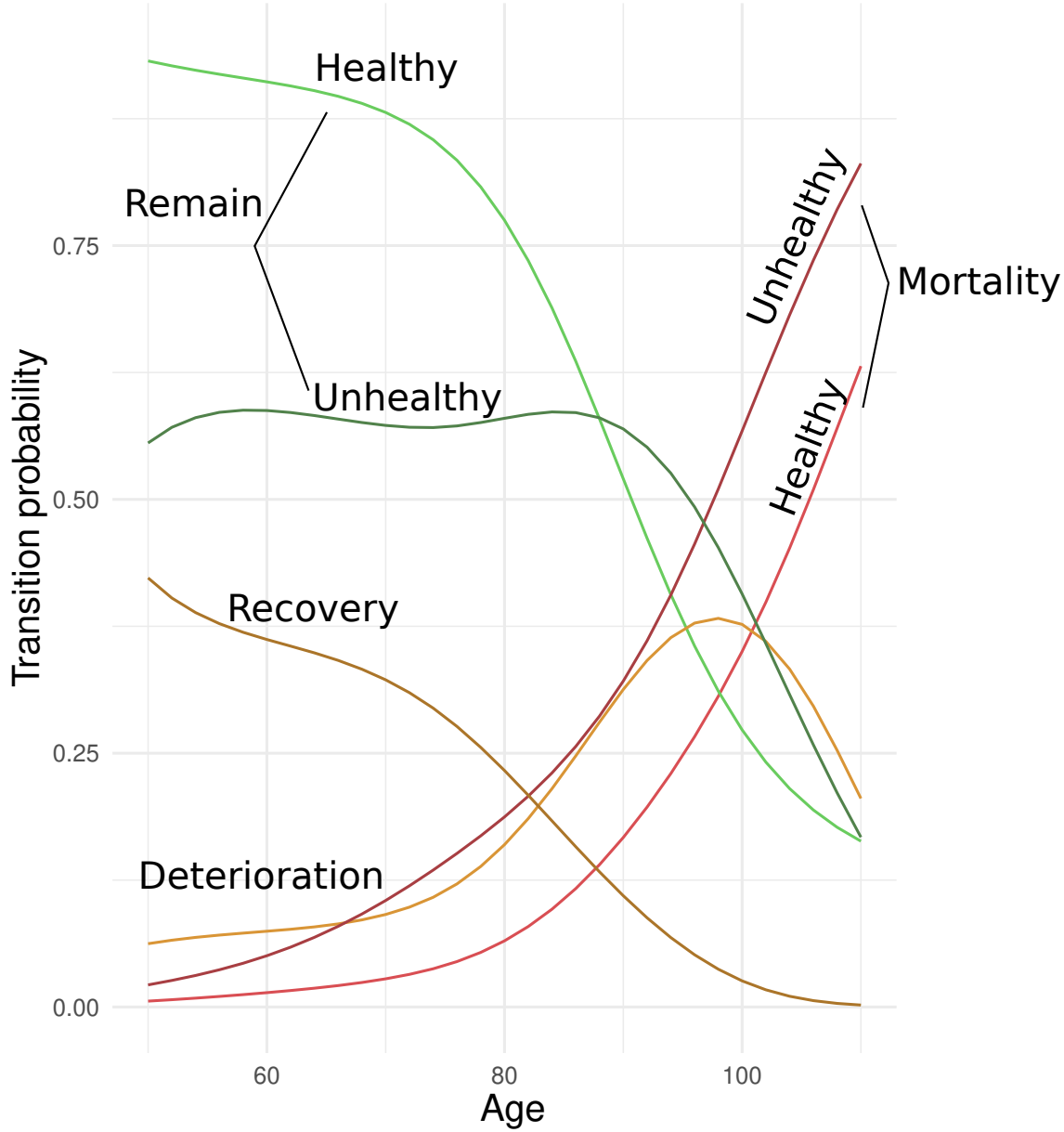
$$HLE = f(\theta)$$

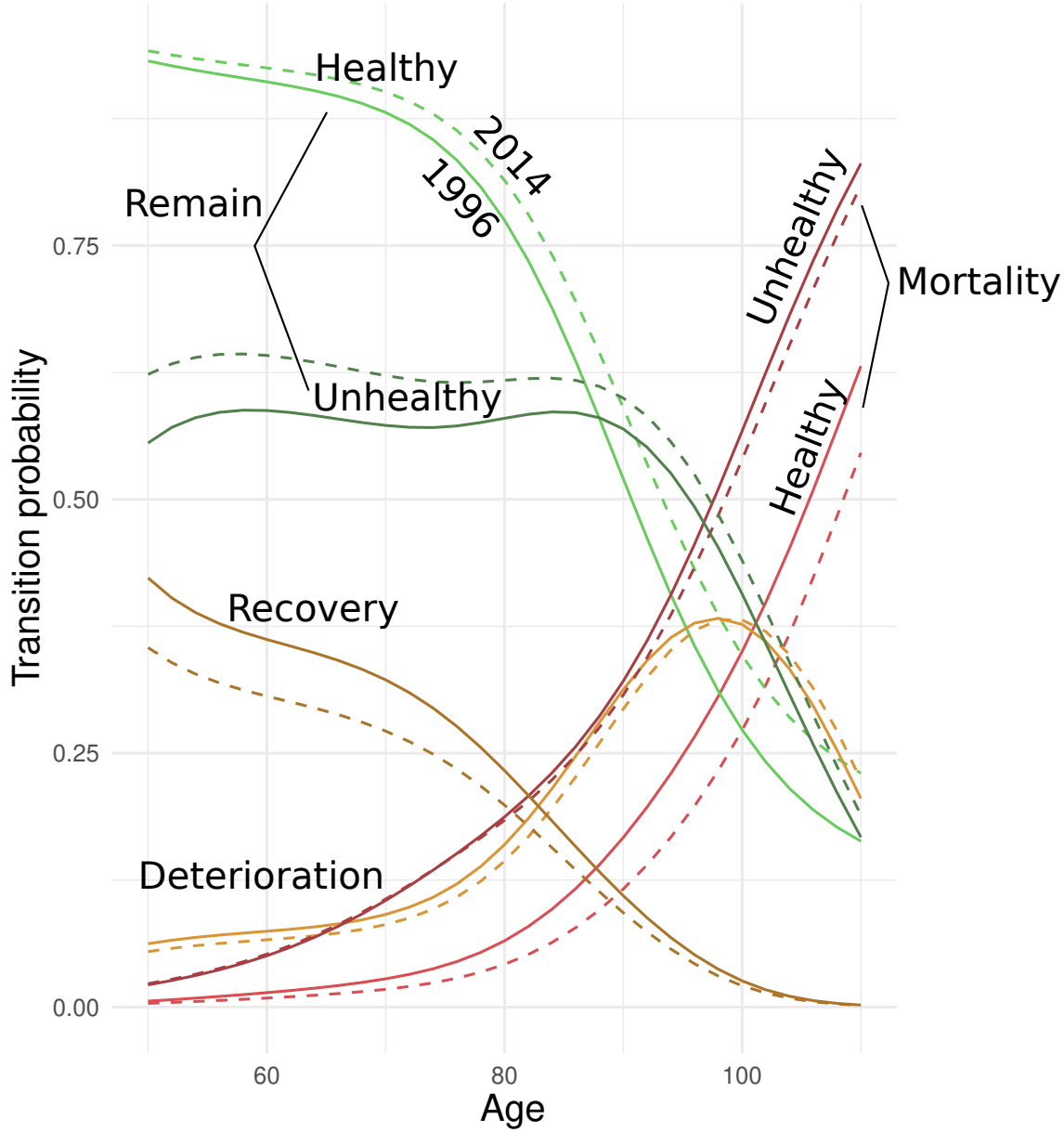
There are different ways to define $f()$ and θ

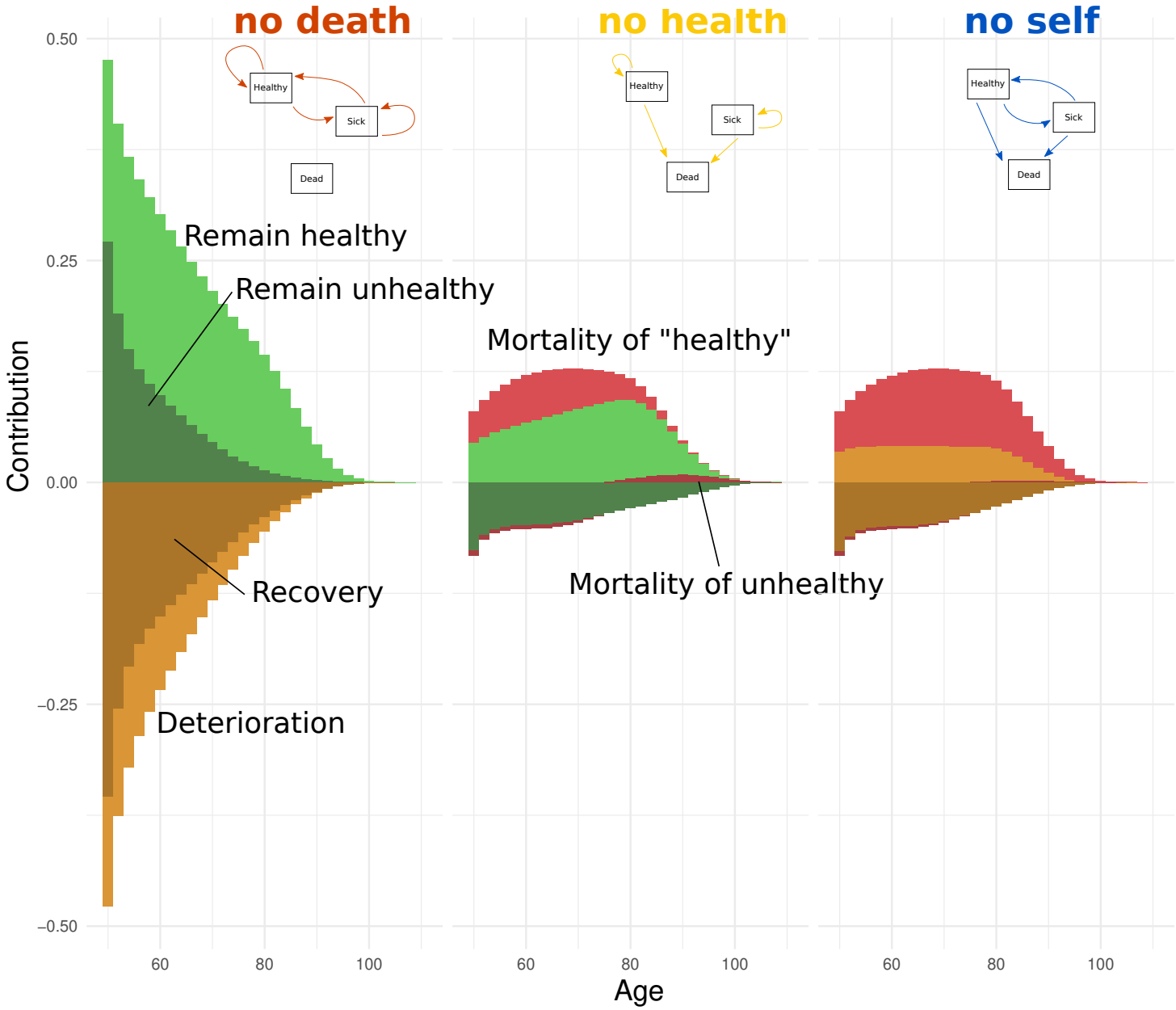

Healthy
Sick
Dead

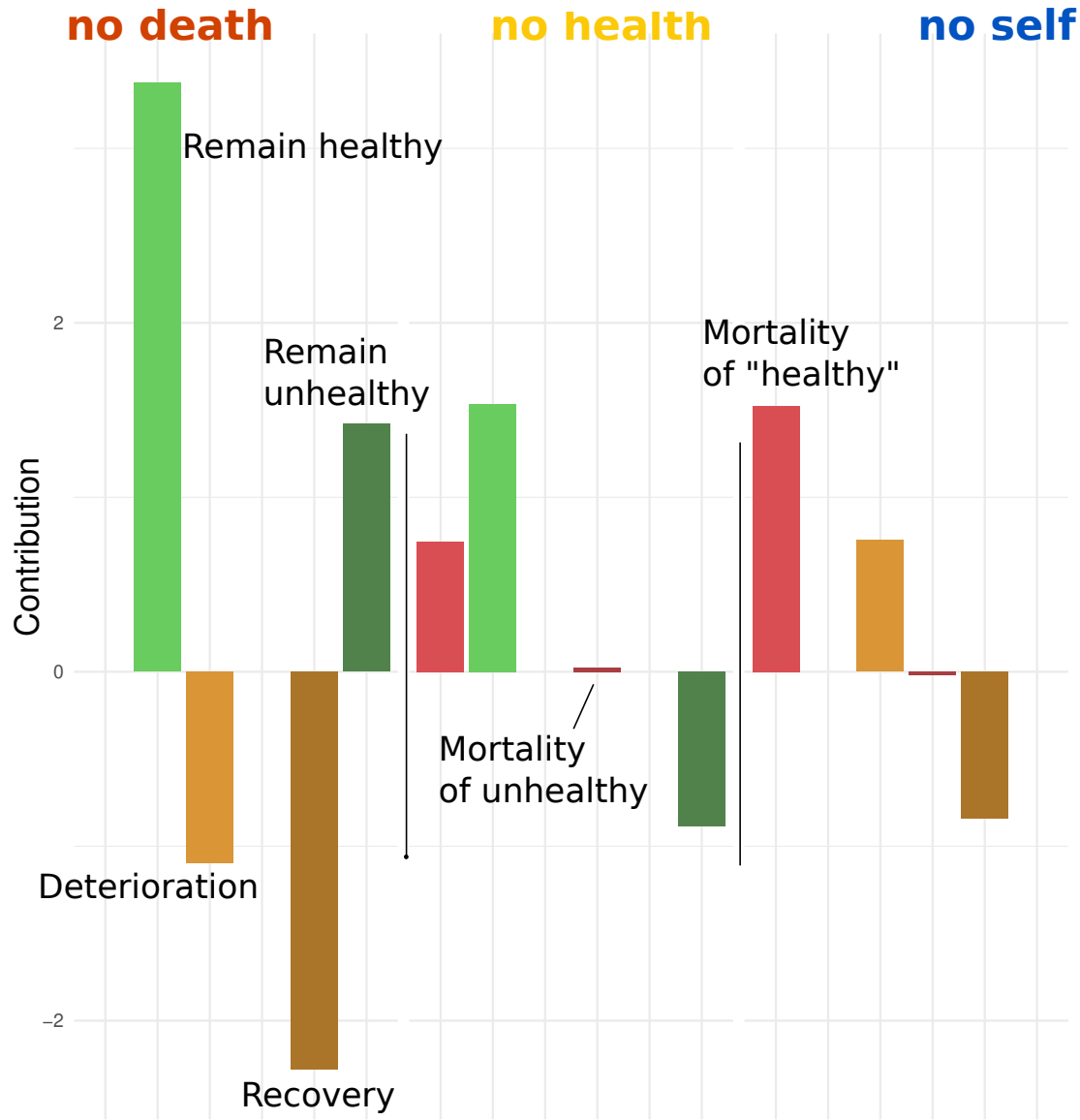
$$HLE = f(\theta) = f(\theta) = f(\theta)$$

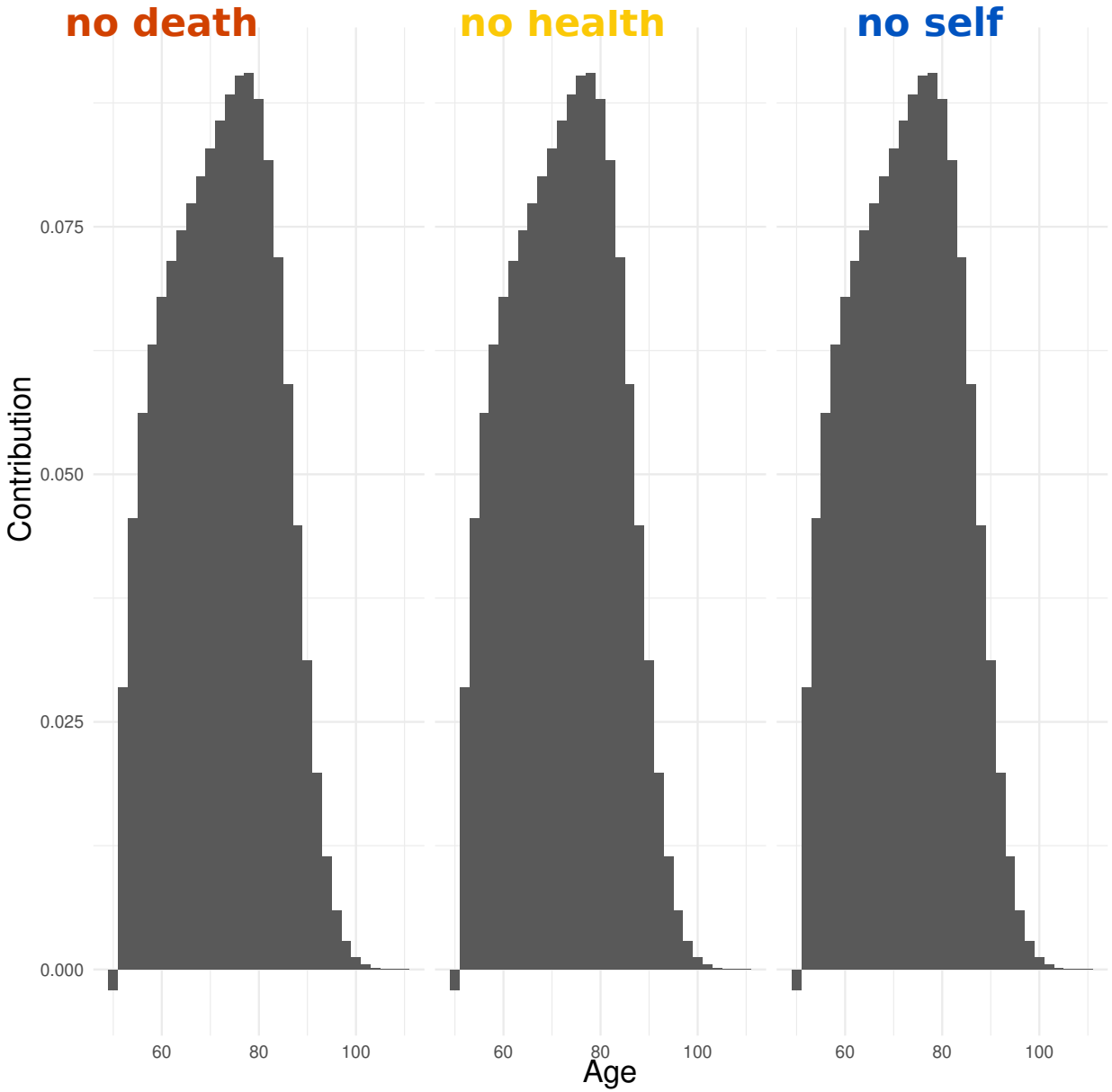
HLE at age 50 for US women increased by 1.4 years from 1996 to 2014. From 24.7 to 26.1 years

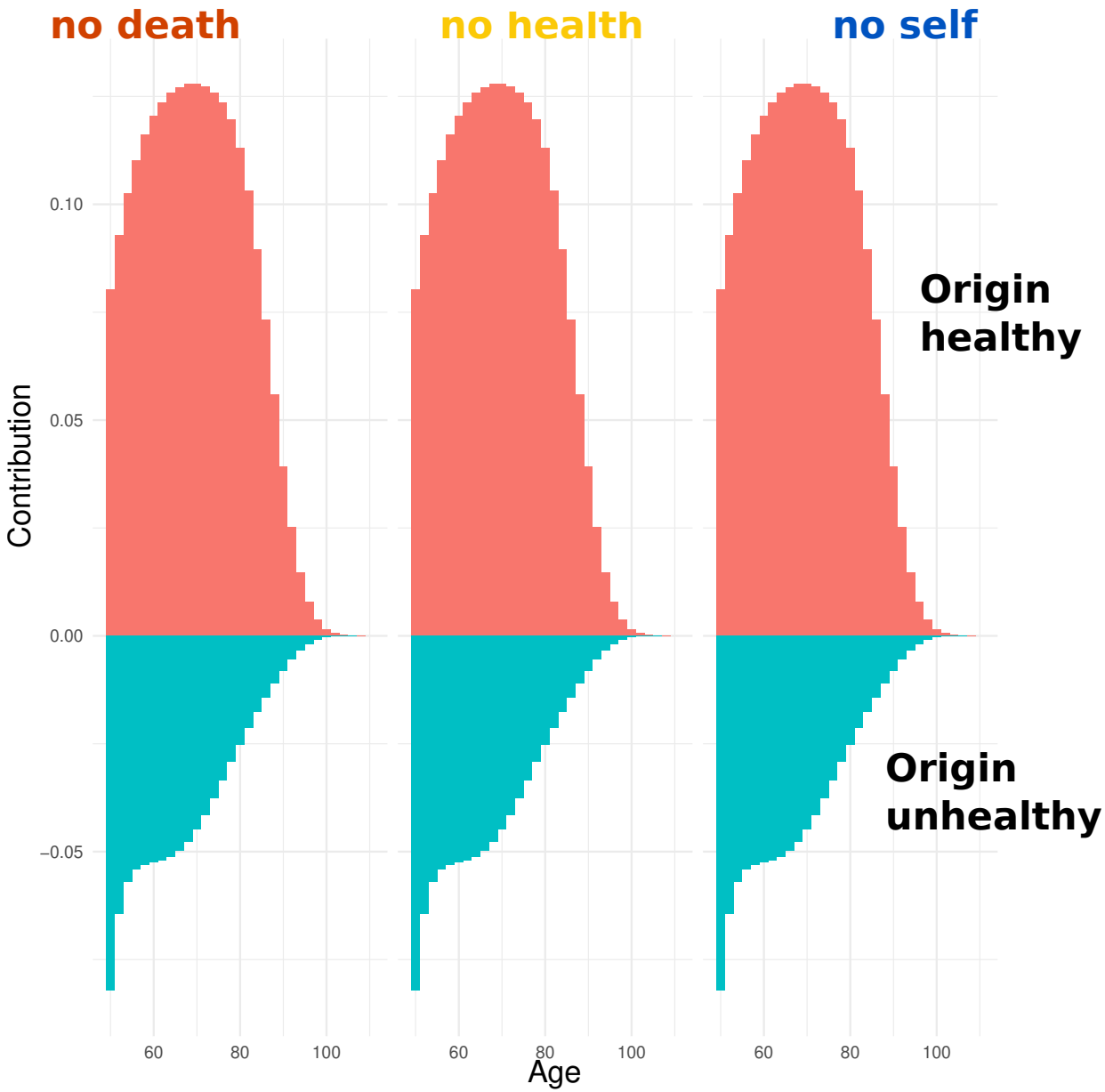

Healthy
Remain
Unhealthy
Recovery
Deterioration
Unhealthy
Healthy
Mortality
Transition probability
0.00
0.25
0.50
0.75
60
80
100
Age


Healthy
2014
1996
Remain
Unhealthy
Recovery
Deterioration
Unhealthy
Healthy
Mortality
Transition probability
0.75
0.50
0.25
0.00
60
80
100
Age


no death
no health
no self
Healthy
Sick
Dead
Remain healthy
Remain unhealthy
Mortality of "healthy"
Recovery
Mortality of unhealthy
Deterioration
Contribution
0.50
0.25
0.00
−0.25
−0.50
60
80
100
Age


no death
no health
no self
Remain healthy
Remain
unhealthy
Mortality
of "healthy"
Contribution
2
0
−2
Deterioration
Mortality
of unhealthy
Recovery


no death
no health
no self
Contribution
0.075
0.050
0.025
0.000
60
80
100
Age


no death
no health
no self
0.10
0.05
0.00
−0.05
Contribution
60
80
100
Age
Origin healthy
Origin unhealthy

Decomposition vs *parameter sensitivity*

How do we decide?

- empirical intuition
- sound parameter transformation
- appeal to authority

Empirical intuition

transition	predicted	no death	no health	no self
"Healthy" Mortality	+		+	+
"Unhealthy" Mortality	+/−		+	−
Deterioration	+	−		+
Recovery	−	−		−
Stay healthy	+	+	+	
Stay unhealthy	+/−	+	−	

Sound parameter transformation

- CoDa approaches
- Conditioning parameters (i.e. survival conditioning)

Appeal to authority

"Attrition is fundamental"

– Frans Willekens or Erhan Çinlar

Thank you