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RESEARCH





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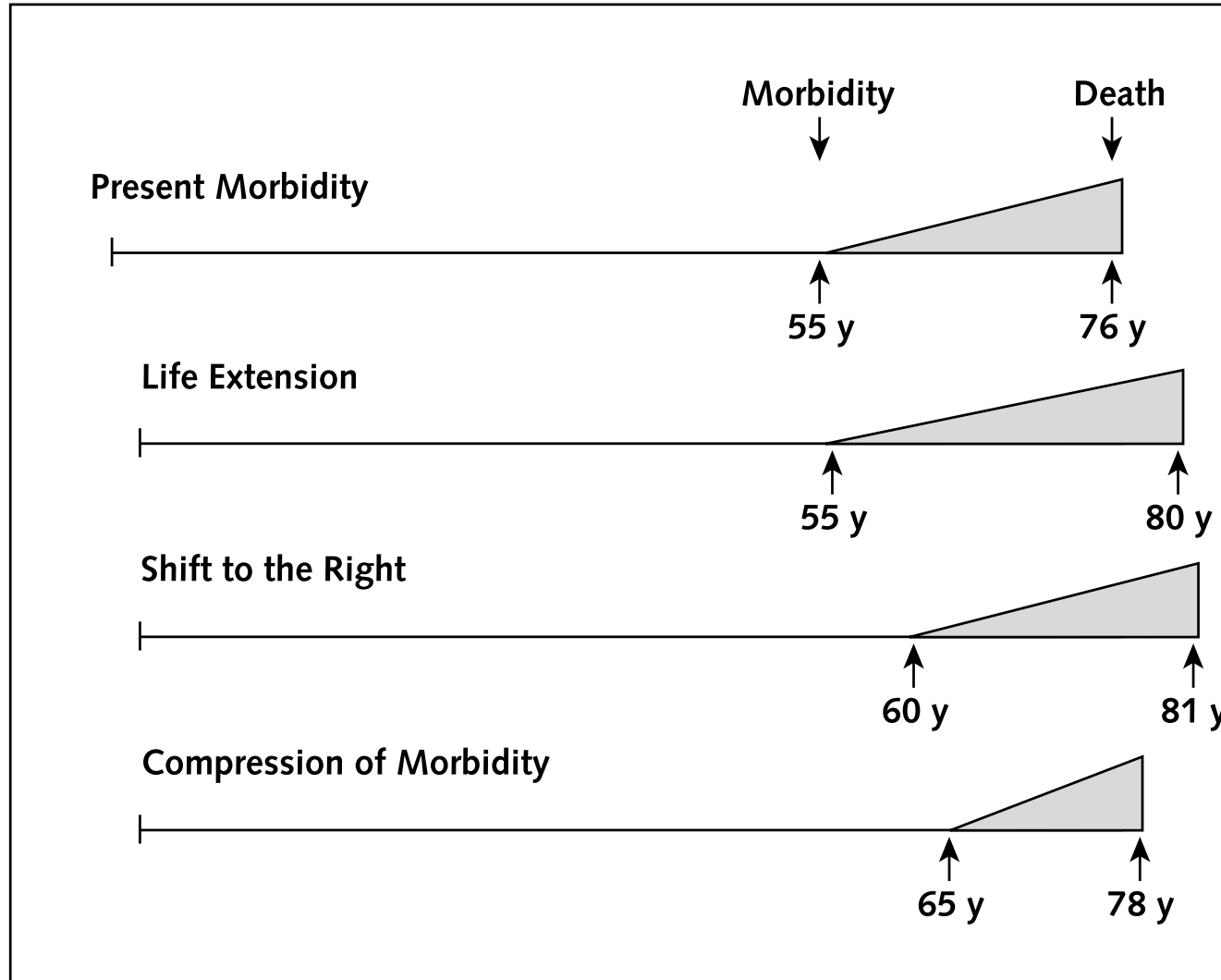
Morbidity concentration and dispersion

Tim Riffe, Aïda Solé Auro, Maarten J. Bijlsma



Fries' diagrams are a nice prop

Figure 1. Possible scenarios for future morbidity and longevity.





Pattern indifference within lifespan





Pattern indifference within lifespan



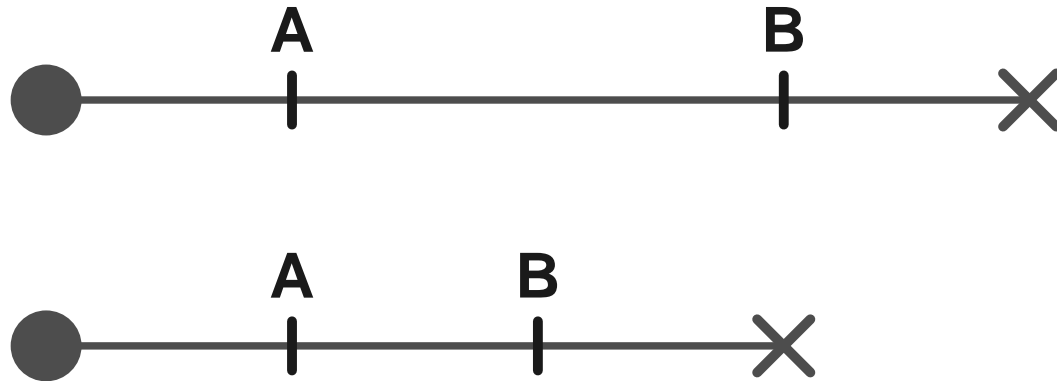


Patterns matter if lifespans are mixed



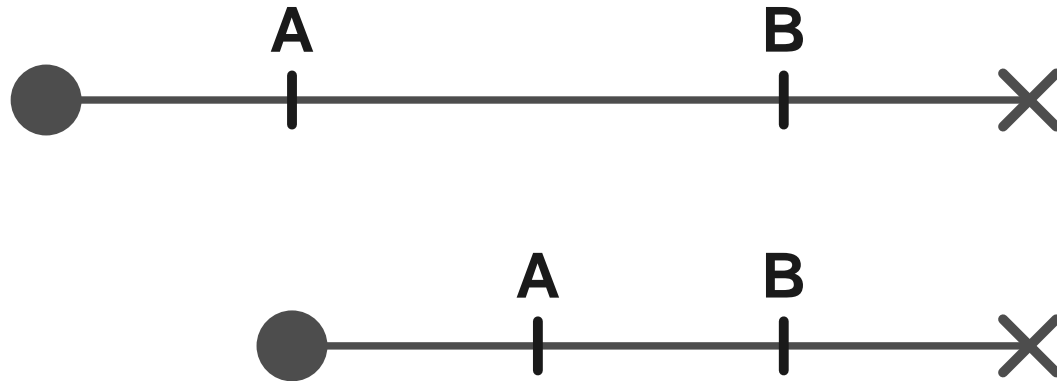


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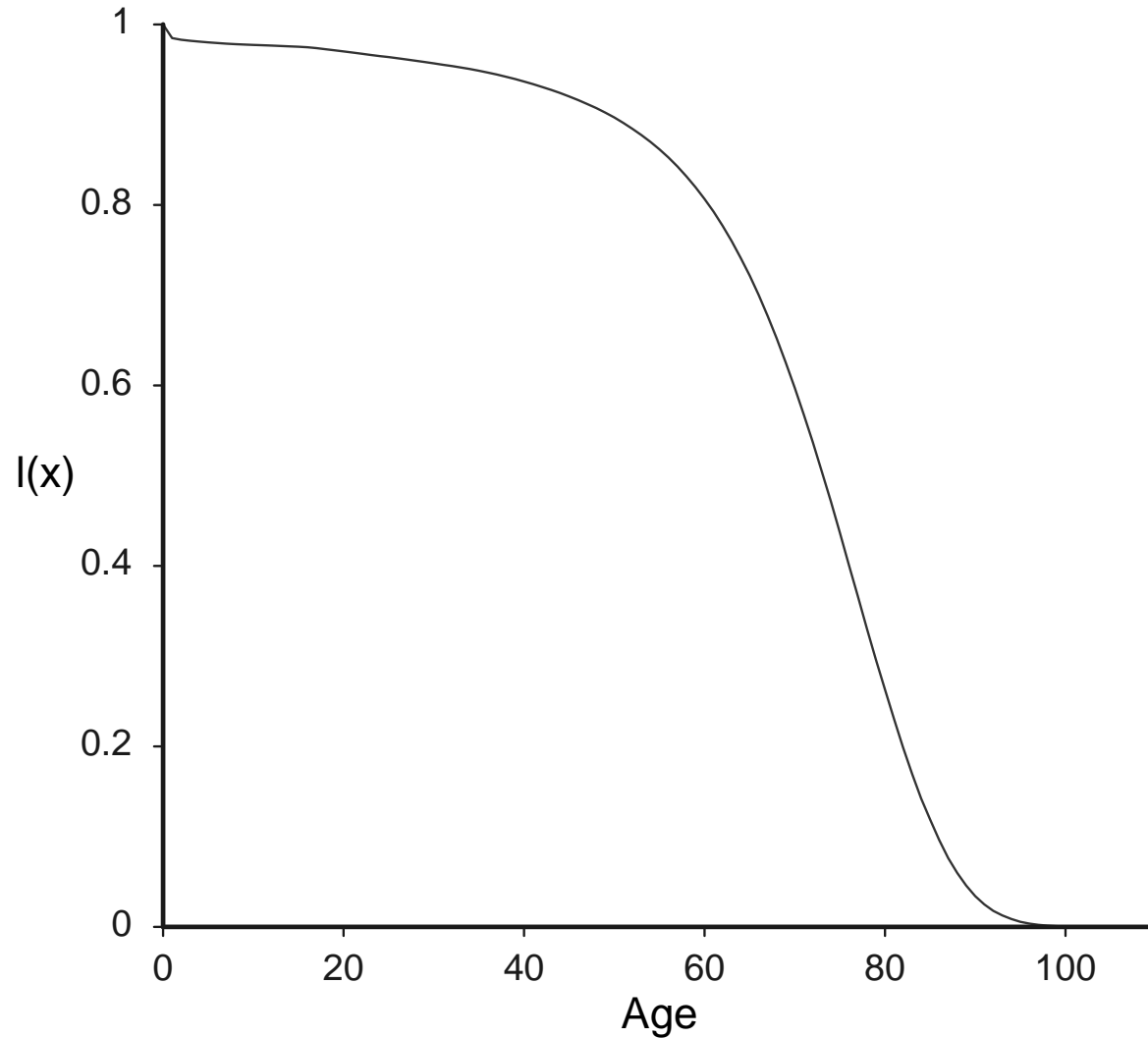


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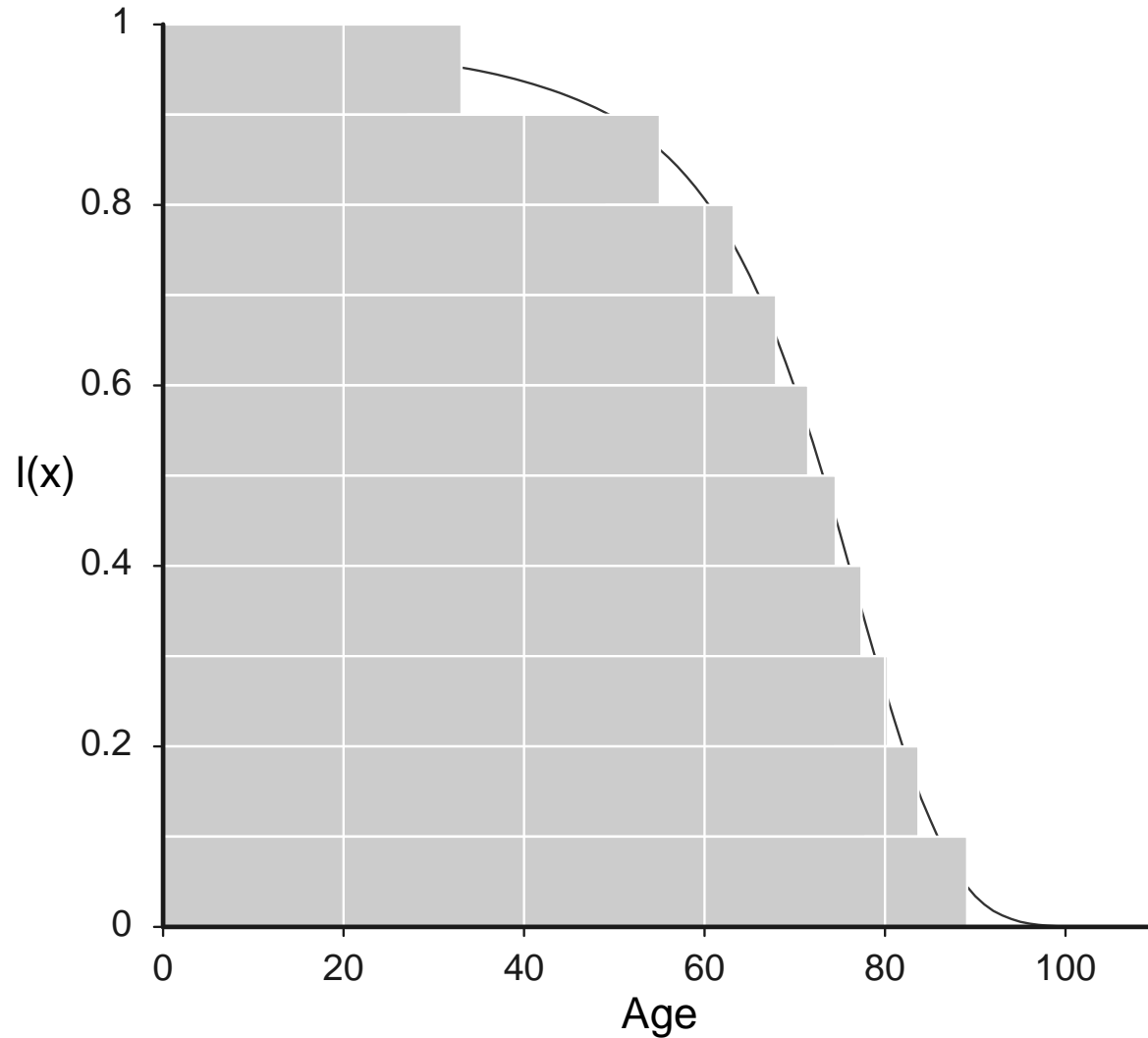


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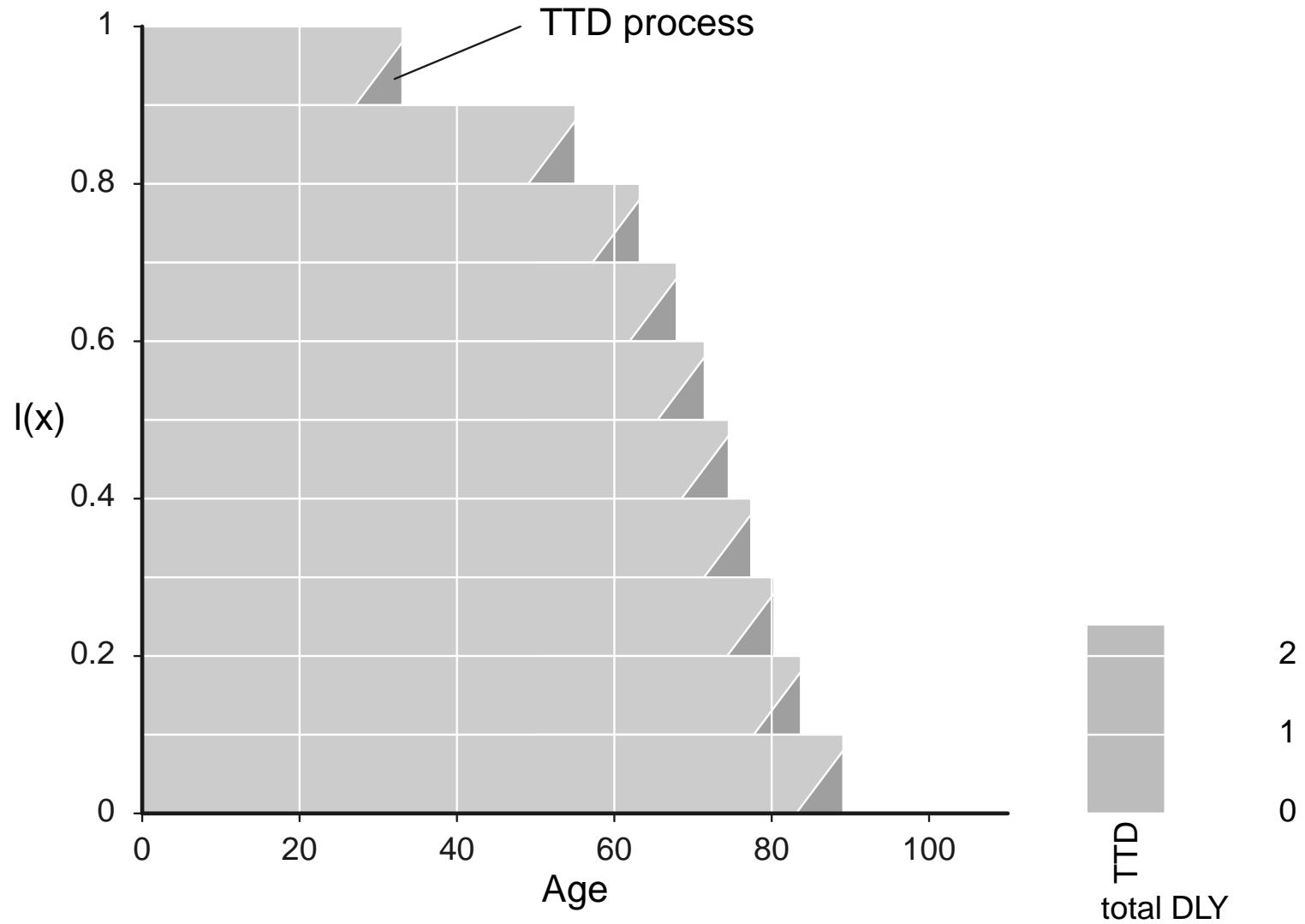


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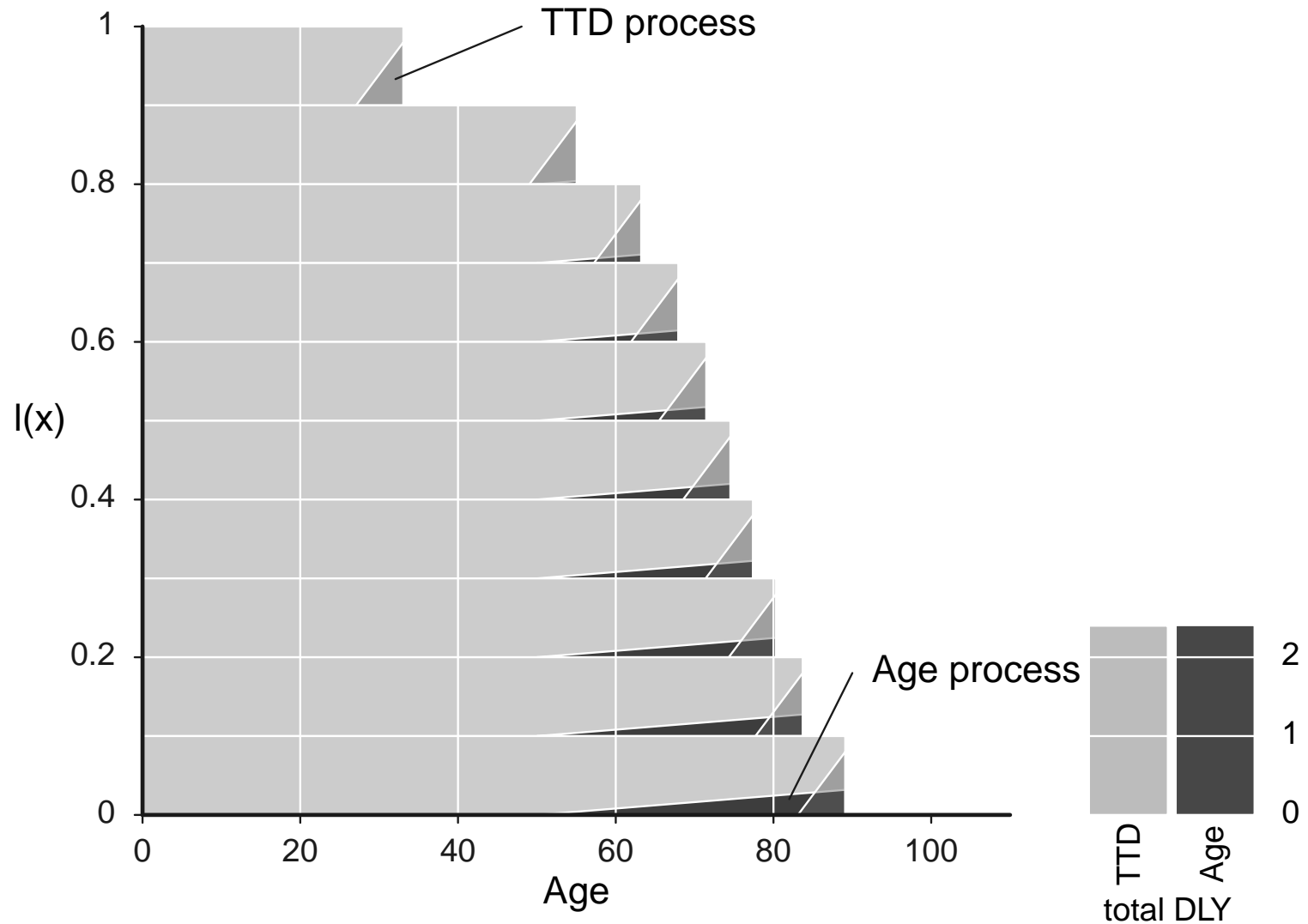


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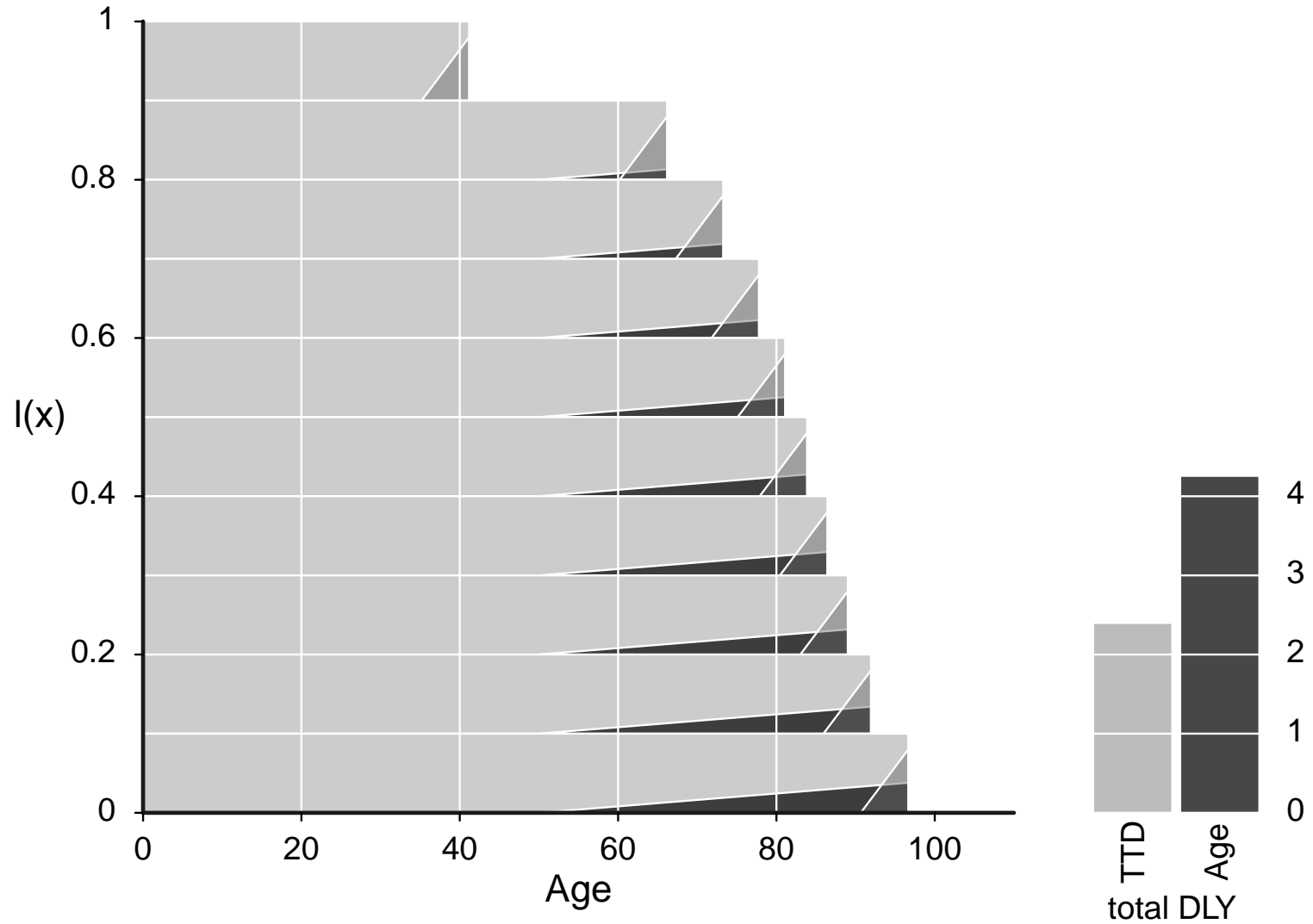


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Compression

Compression definition

The level of morbidity compression is the average proportion of life in good health, $\mathbb{C} = \frac{HLE}{LE}$.

Objective:

Separate morbidity levels and morbidity dispersion.



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Morbidity dispersion, \mathbb{D} , is the average time-to-death of late-life morbidity prevalence.

Formal definition

$$\mathbb{D} = \frac{\int_0^{\omega} y \pi^*(y) \, dy}{\int_0^{\omega} \pi^*(y) \, dy} \quad (1)$$

where y is time until death, and $\pi^*(y)$ is morbidity prevalence by time to death.

Or one might rather weight a lifespan-varying $\pi(y, l)$, by the length-of-life distribution.



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Scenarios

Scenario

ULE

HLE

LE

℄



℄

Base







Scenarios

Scenario		ULE	HLE	LE	\mathbb{C}	\mathbb{D}
Base						
		=	=	=	=	↓





Scenarios

Scenario		ULE	HLE	LE	\mathbb{C}	\mathbb{D}
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Scenarios

Scenario		ULE	HLE	LE	\mathbb{C}	\mathbb{D}
Base						
		↓	↑	=	↑	=





Scenarios

Scenario		ULE	HLE	LE	\mathbb{C}	\mathbb{D}
Base						
		↓	↑	=	↑	↓





Scenarios

Scenario		ULE	HLE	LE	\mathbb{C}	\mathbb{D}
Base						
		\uparrow	\downarrow	$=$	\downarrow	$=$










Scenarios

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Base					
	$=$	\uparrow	\uparrow	\uparrow	$=$
					





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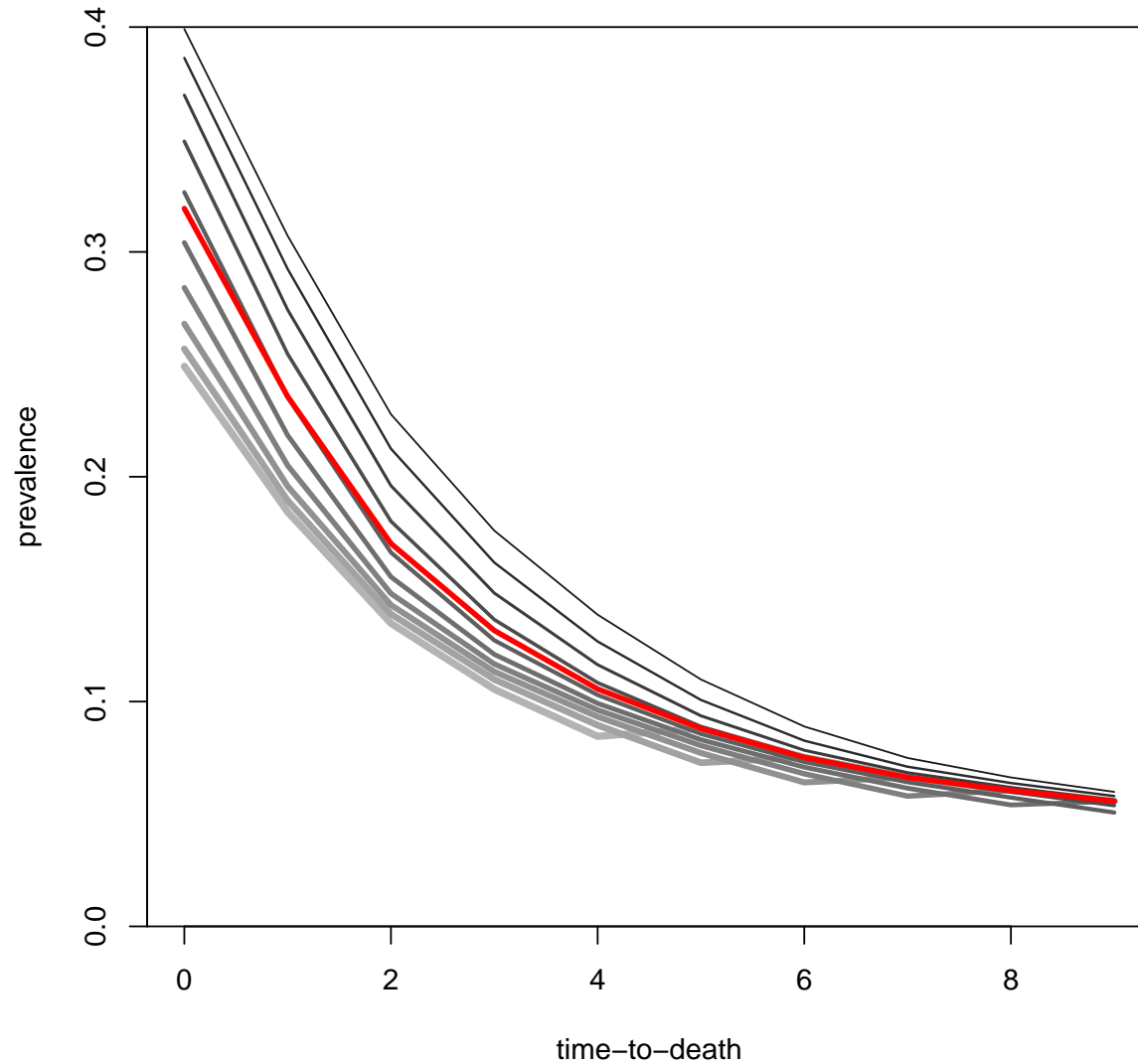
Scenarios

Scenario		ULE	HLE	LE	\mathbb{C}	\mathbb{D}
Base						
	 =	↑	↑	↑	↓	



Observed time-to-death patterns (HRS, ADL3)

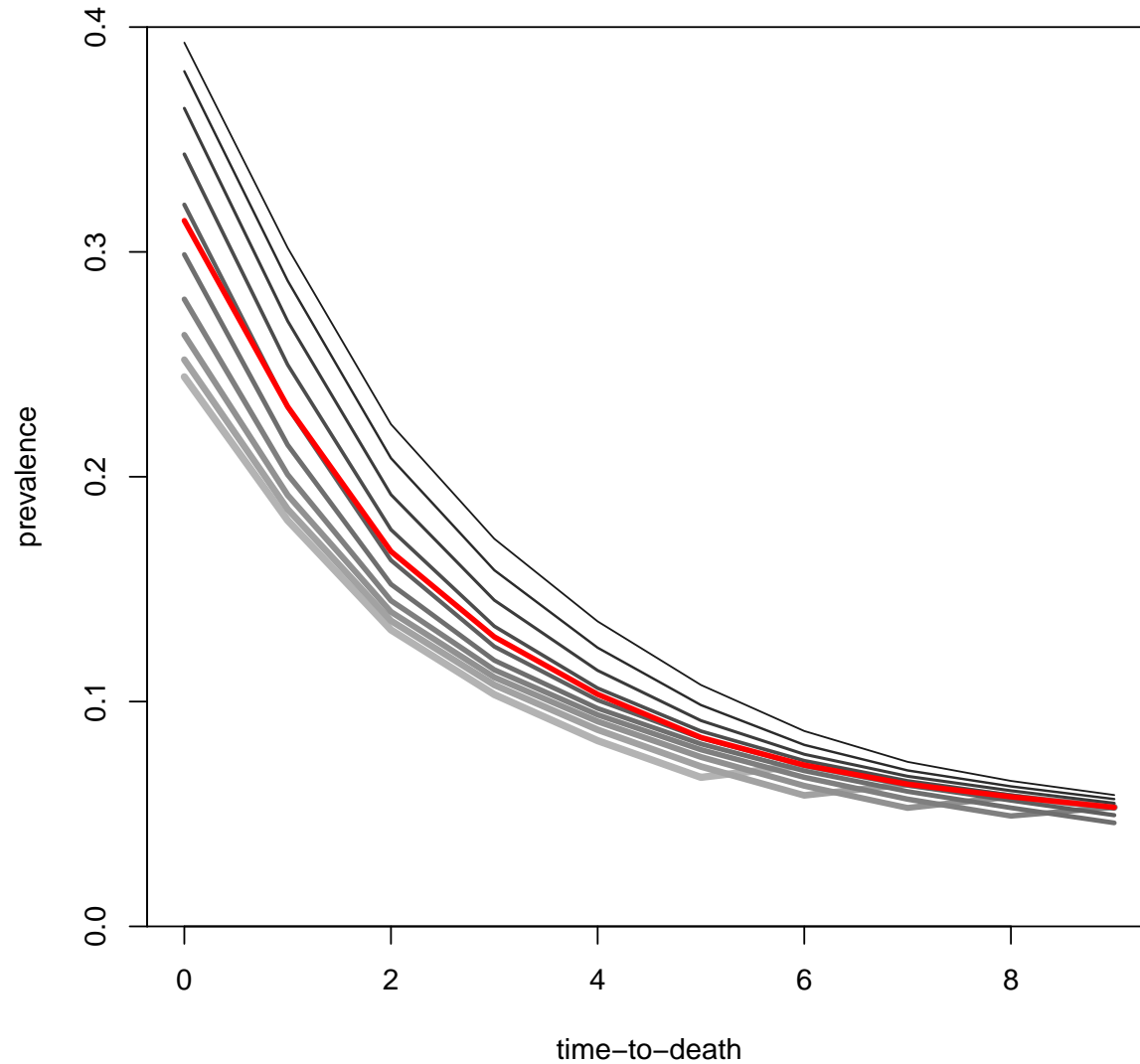
1915





Observed time-to-death patterns (HRS, ADL3)

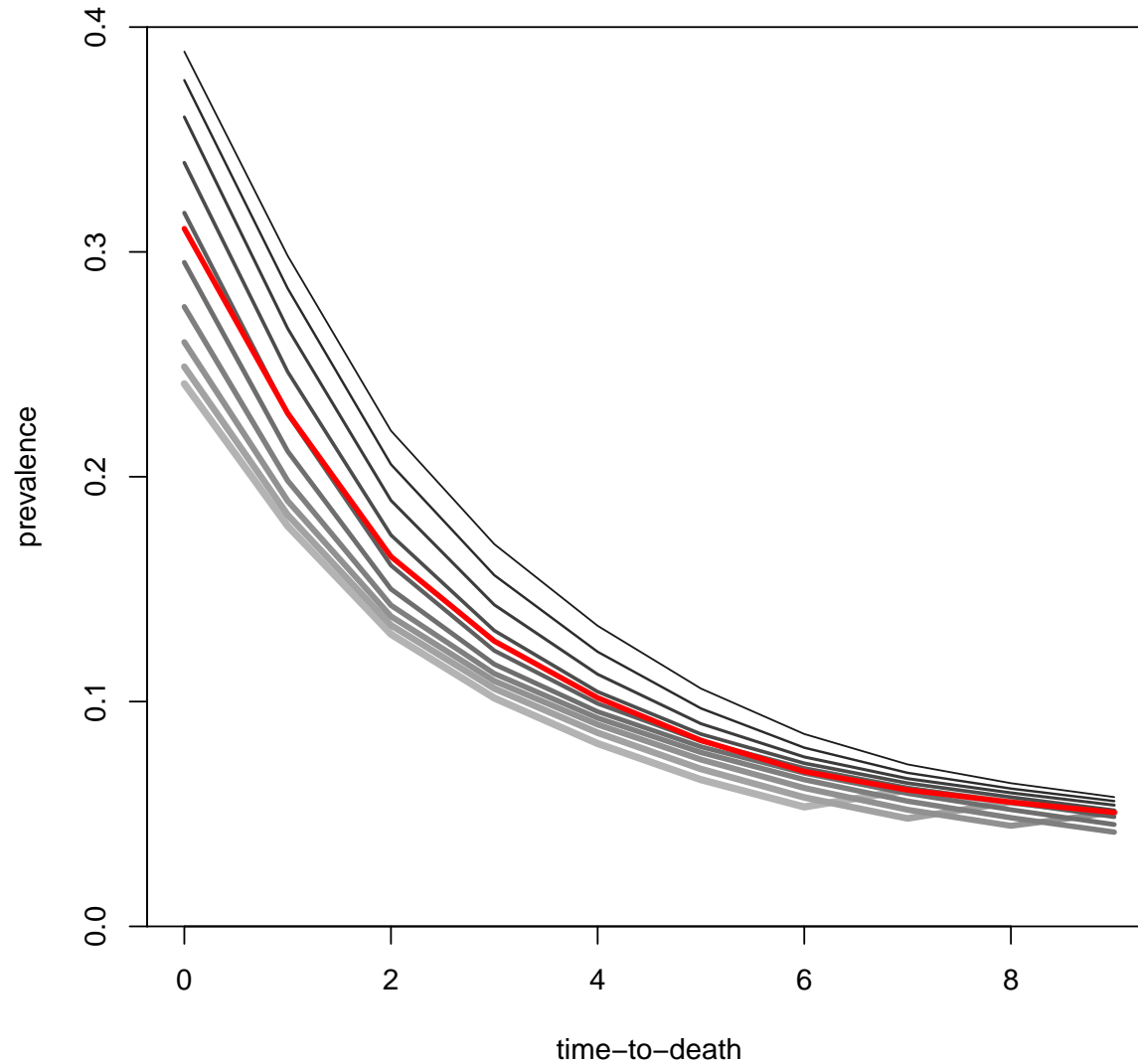
1916





Observed time-to-death patterns (HRS, ADL3)

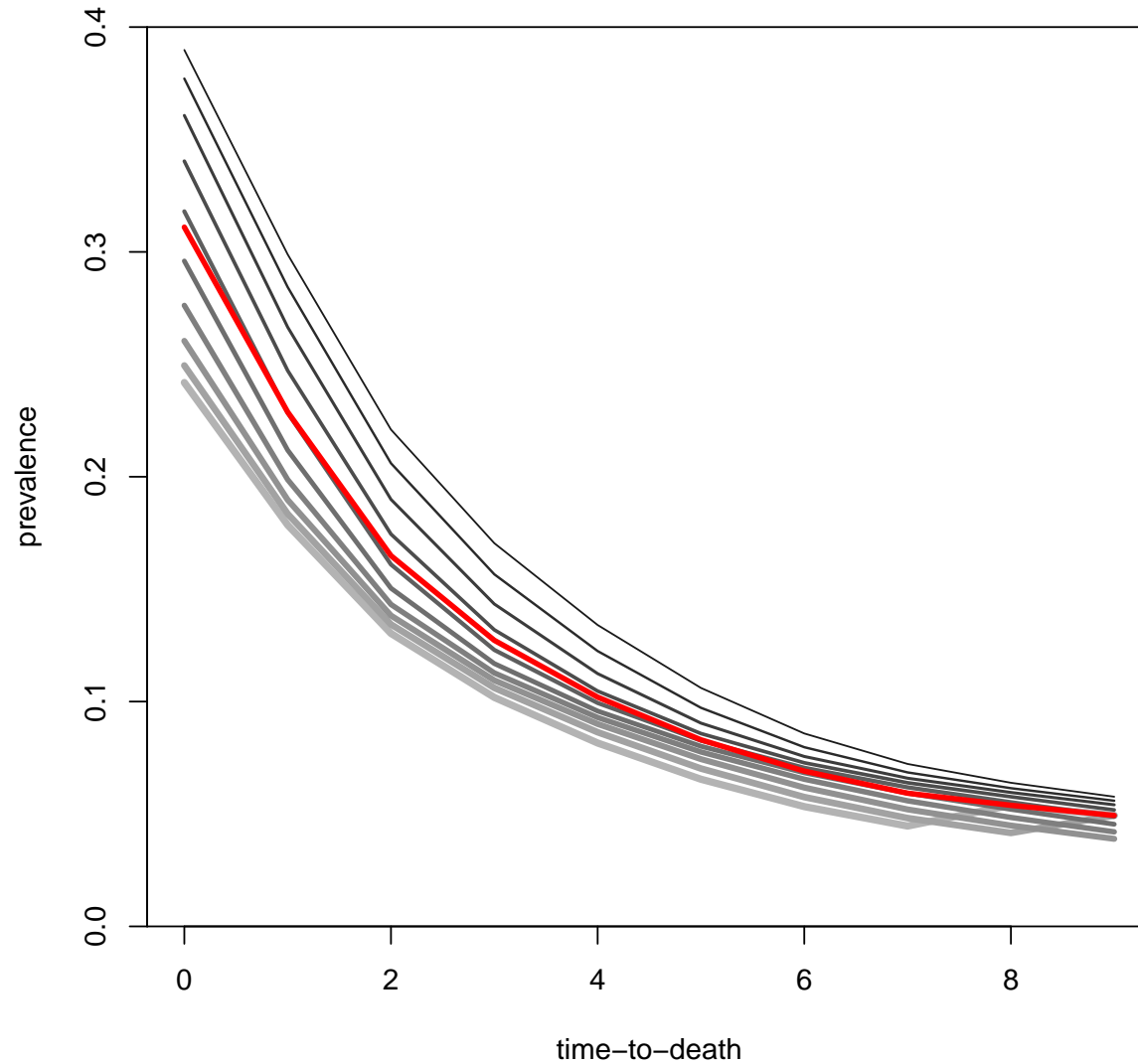
1917





Observed time-to-death patterns (HRS, ADL3)

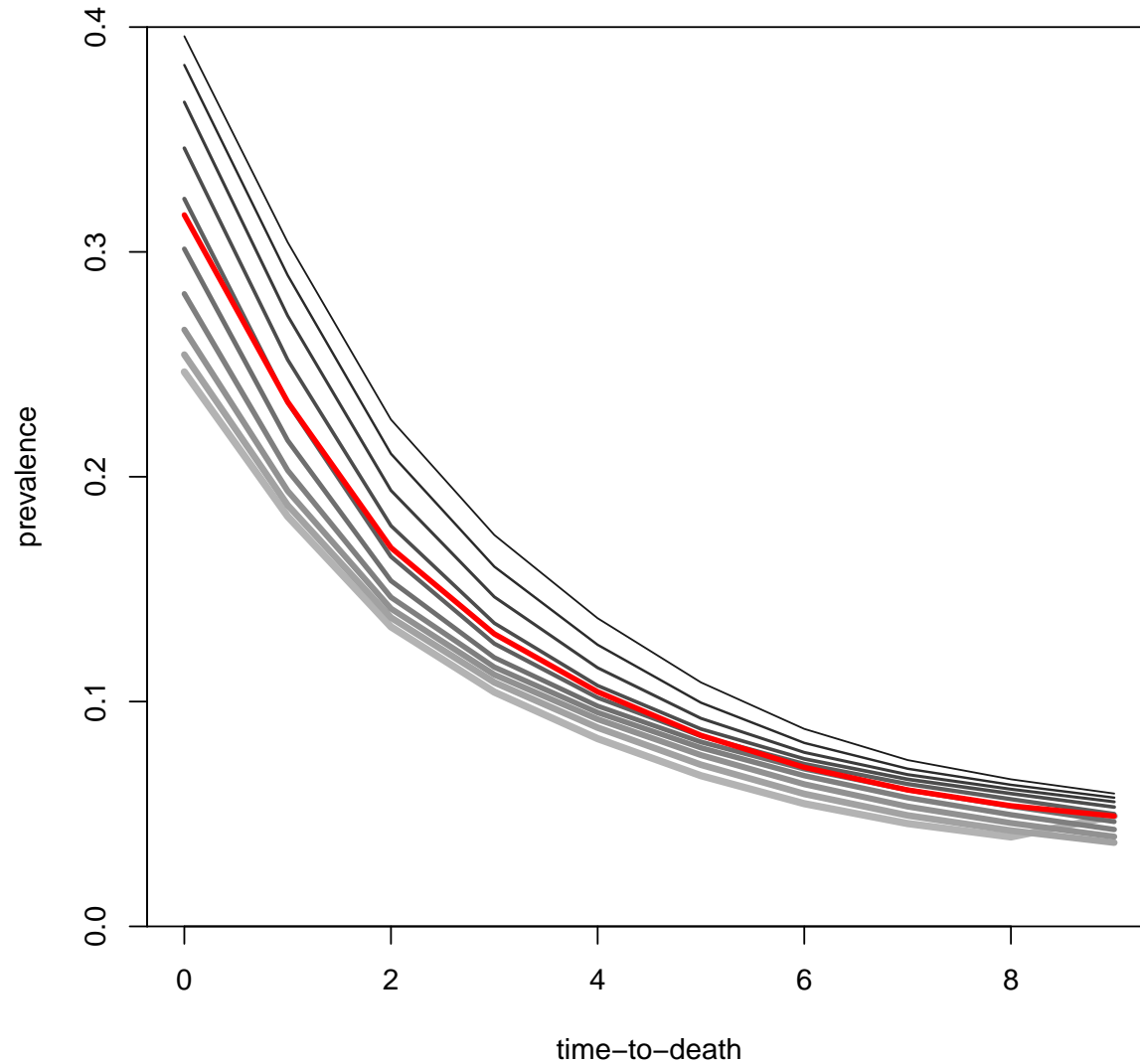
1918





Observed time-to-death patterns (HRS, ADL3)

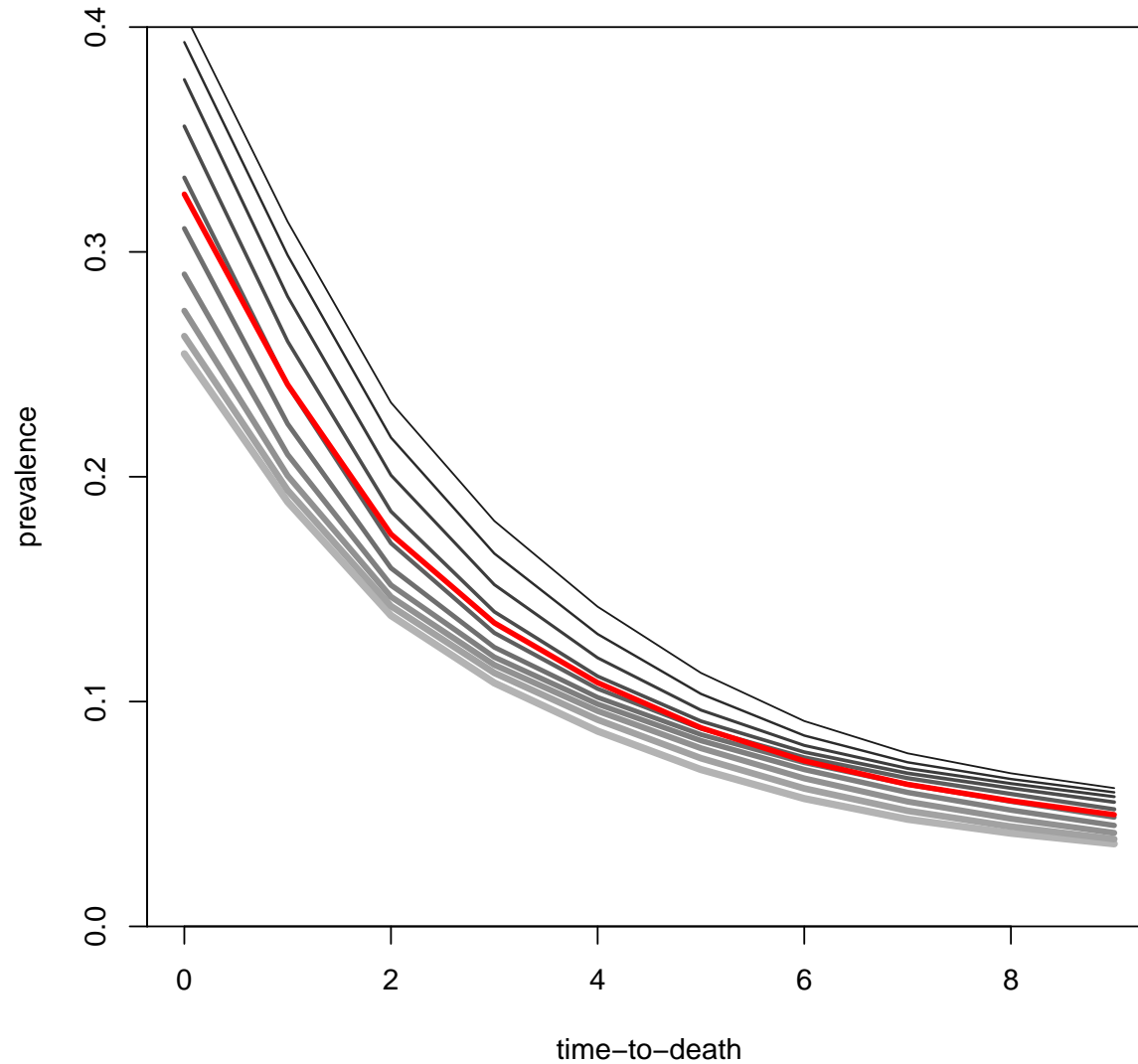
1919





Observed time-to-death patterns (HRS, ADL3)

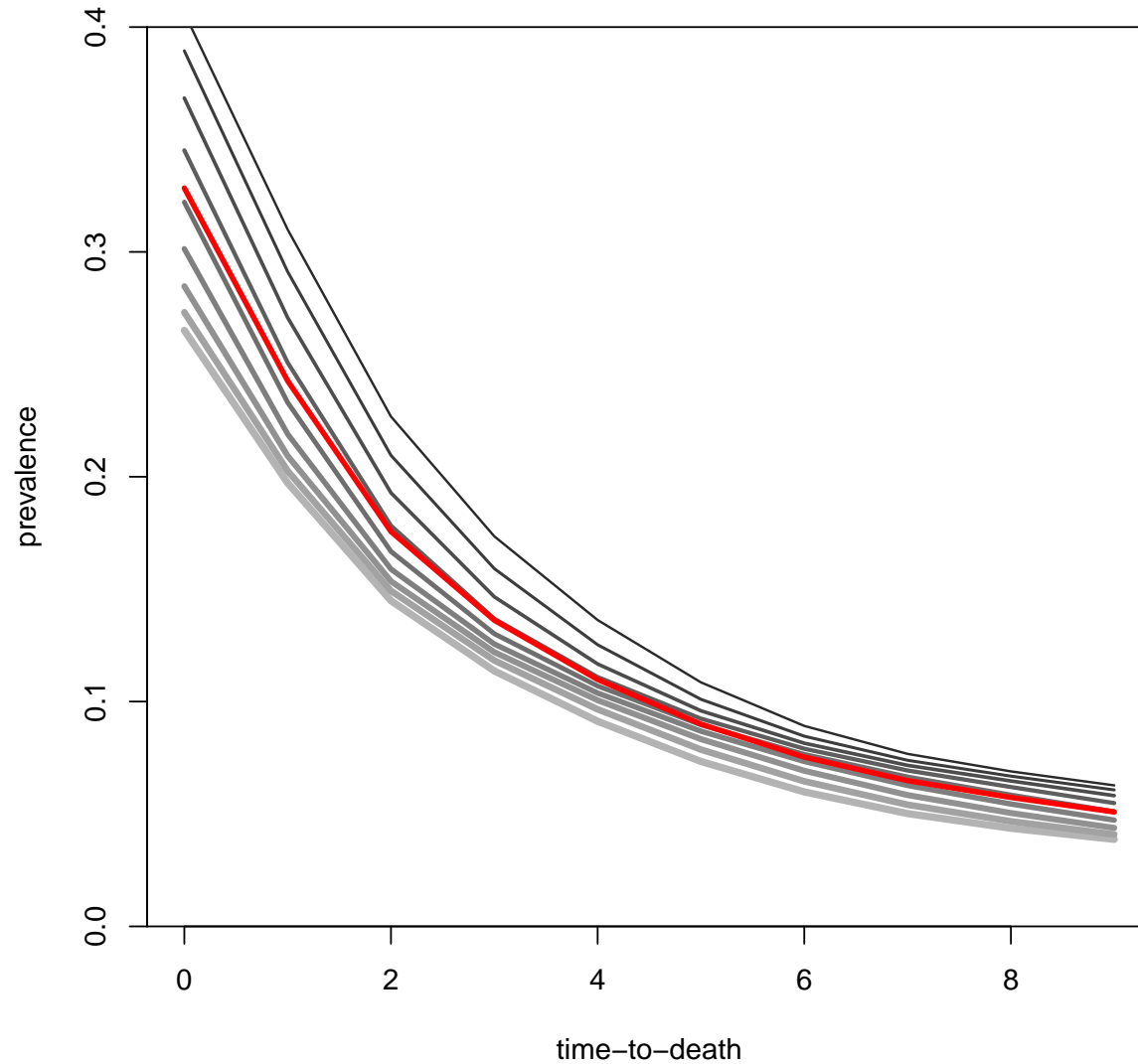
1920





Observed time-to-death patterns (HRS, ADL3)

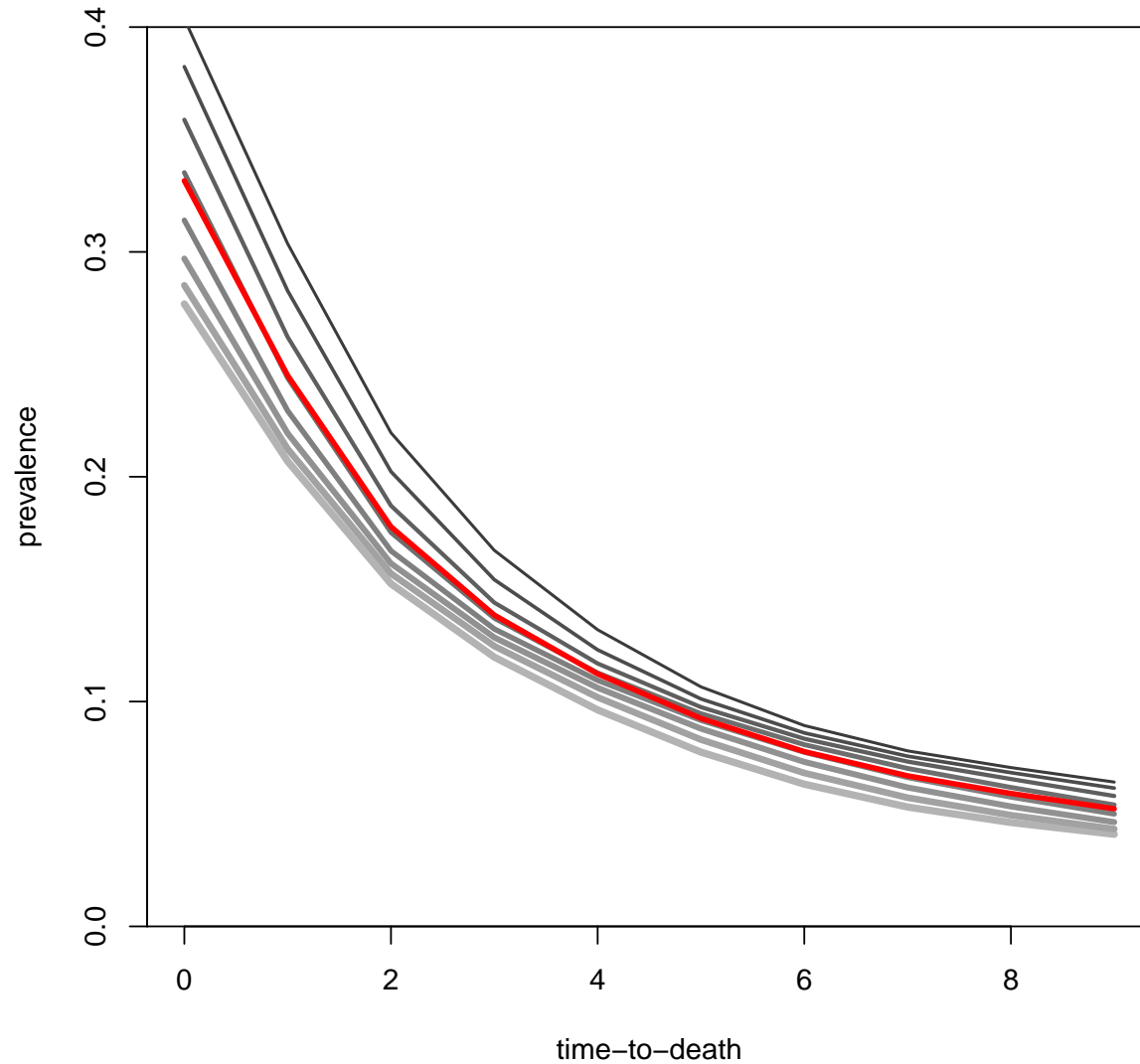
1921





Observed time-to-death patterns (HRS, ADL3)

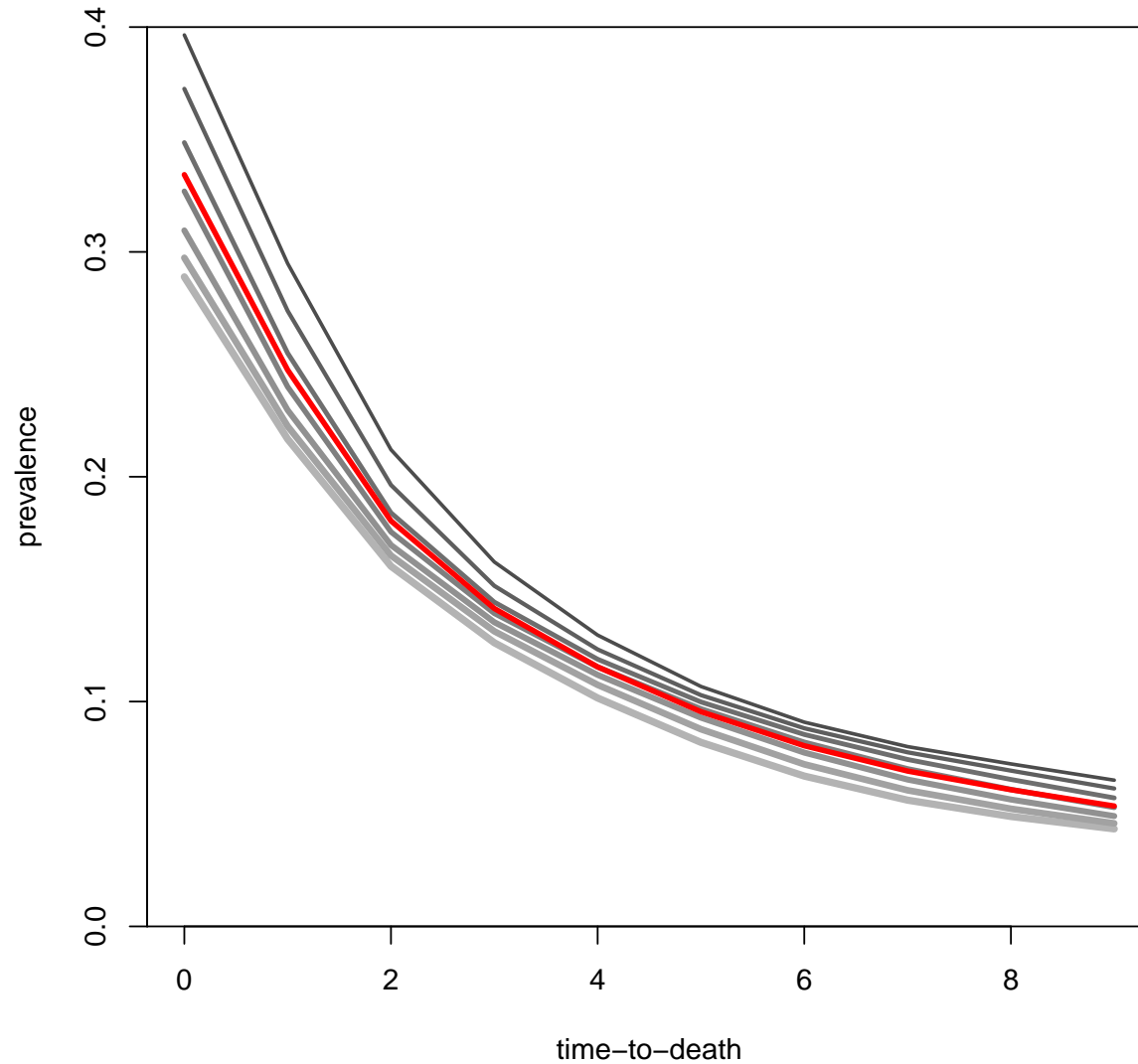
1922





Observed time-to-death patterns (HRS, ADL3)

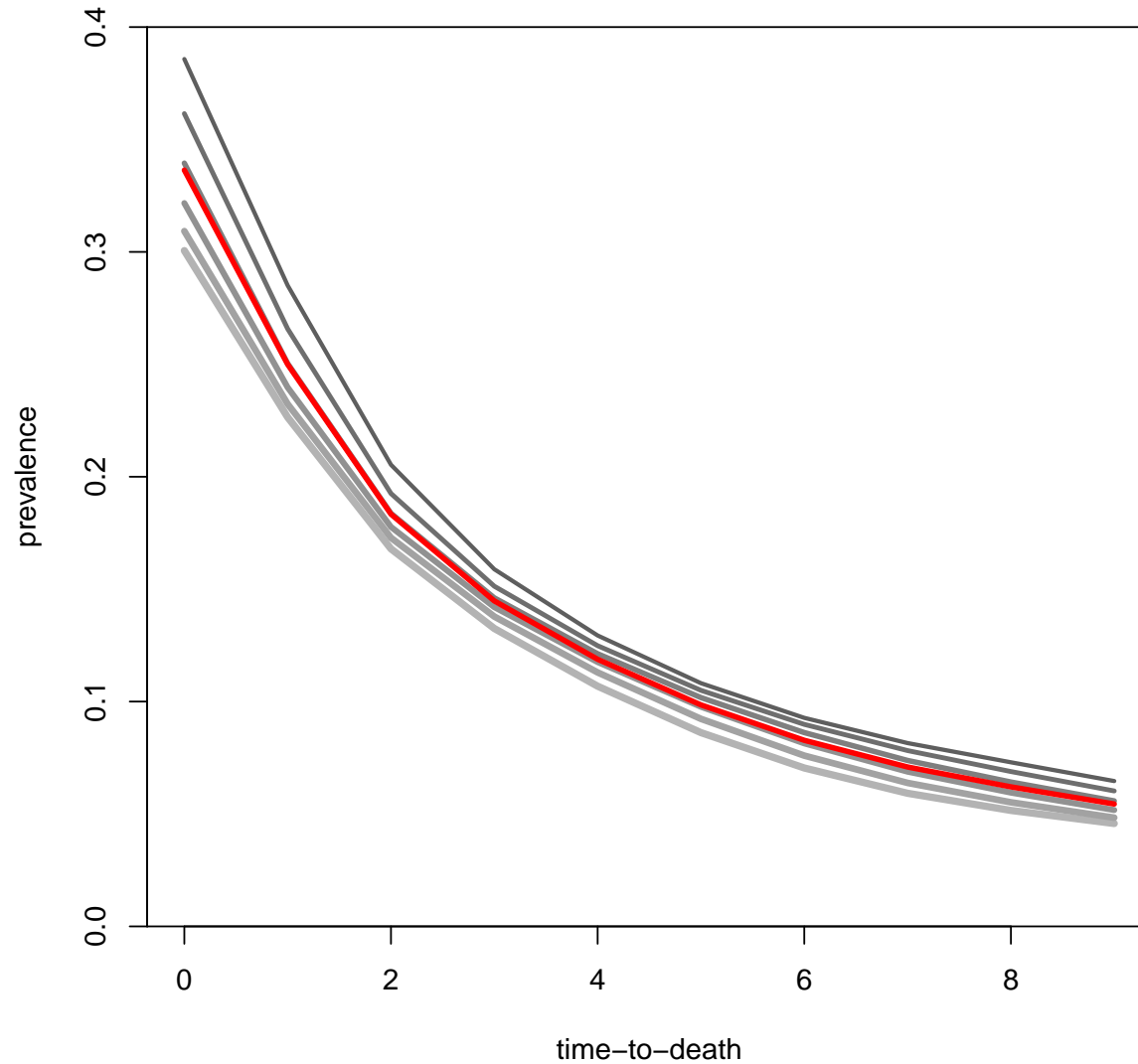
1923





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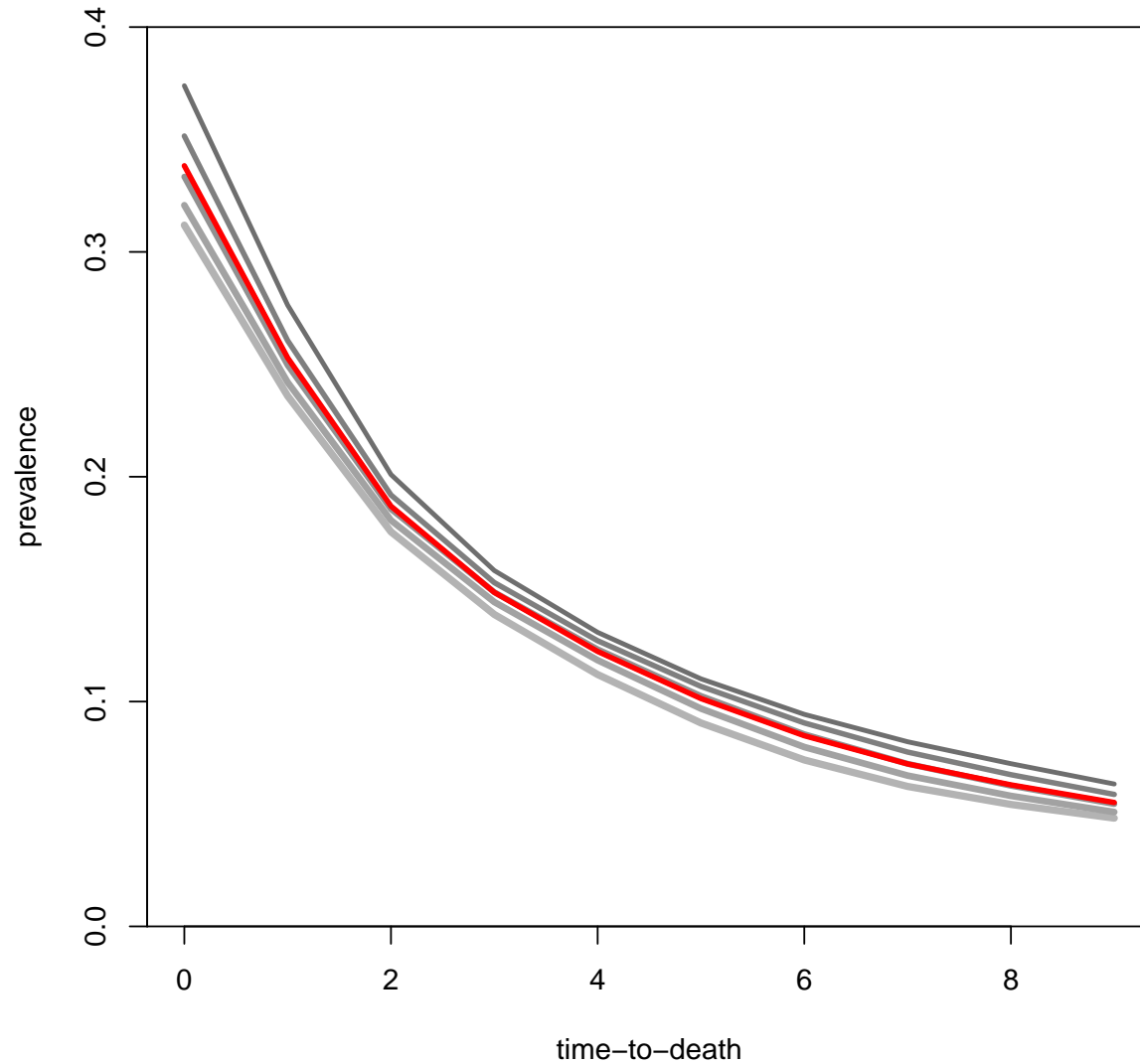
1924





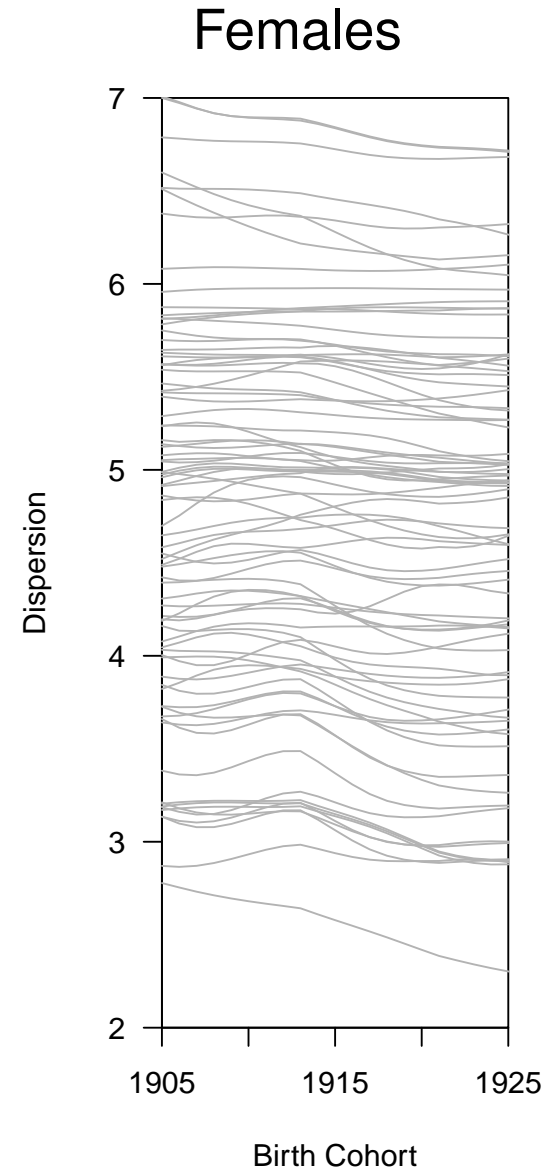
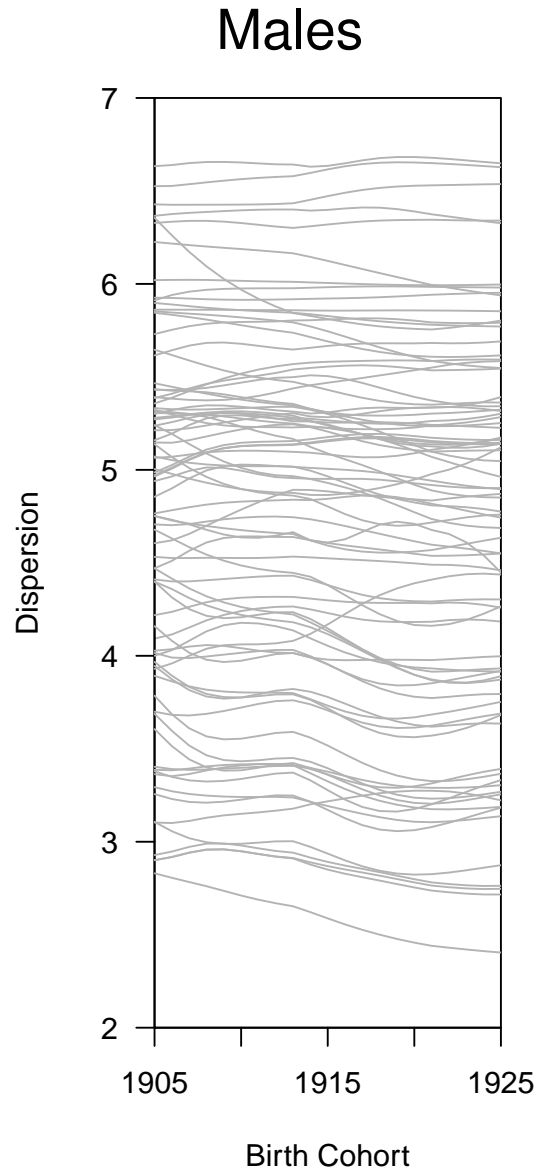
Observed time-to-death patterns (HRS, ADL3)

1925



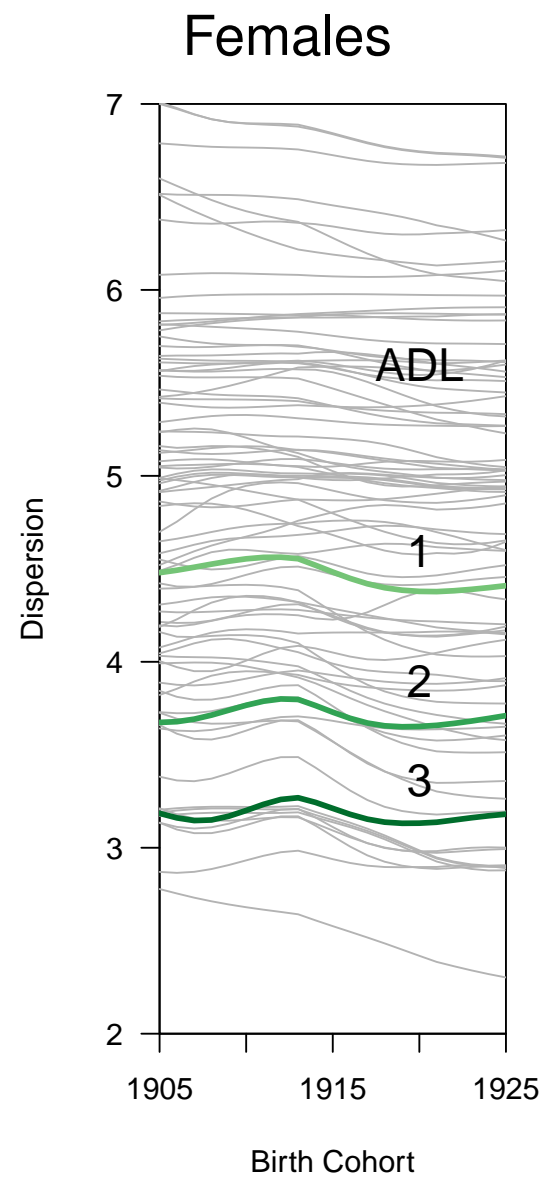
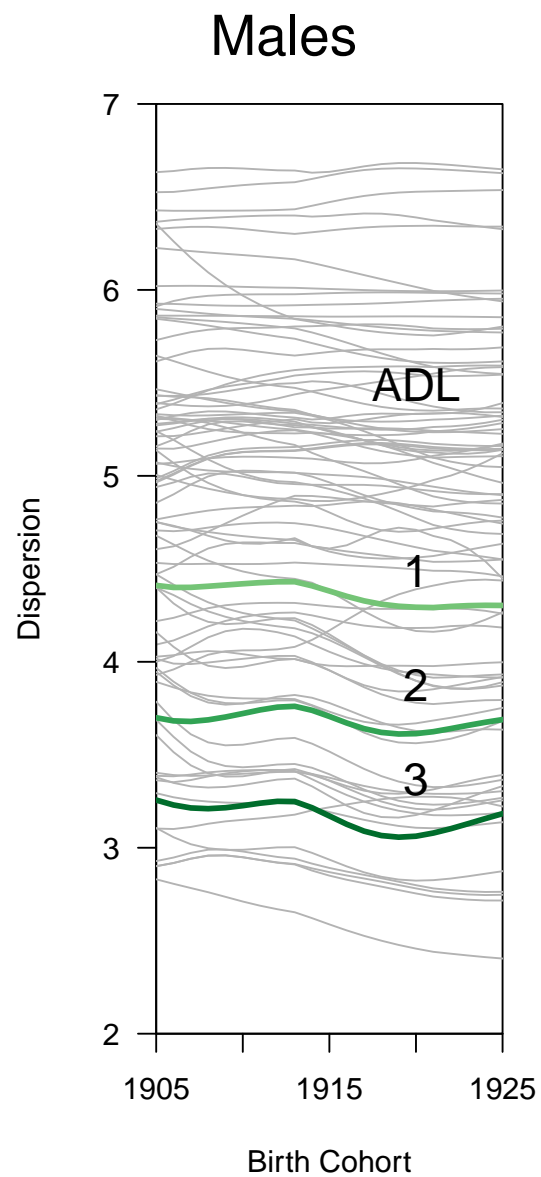


Results from HRS (RAND, vP), 82 measures



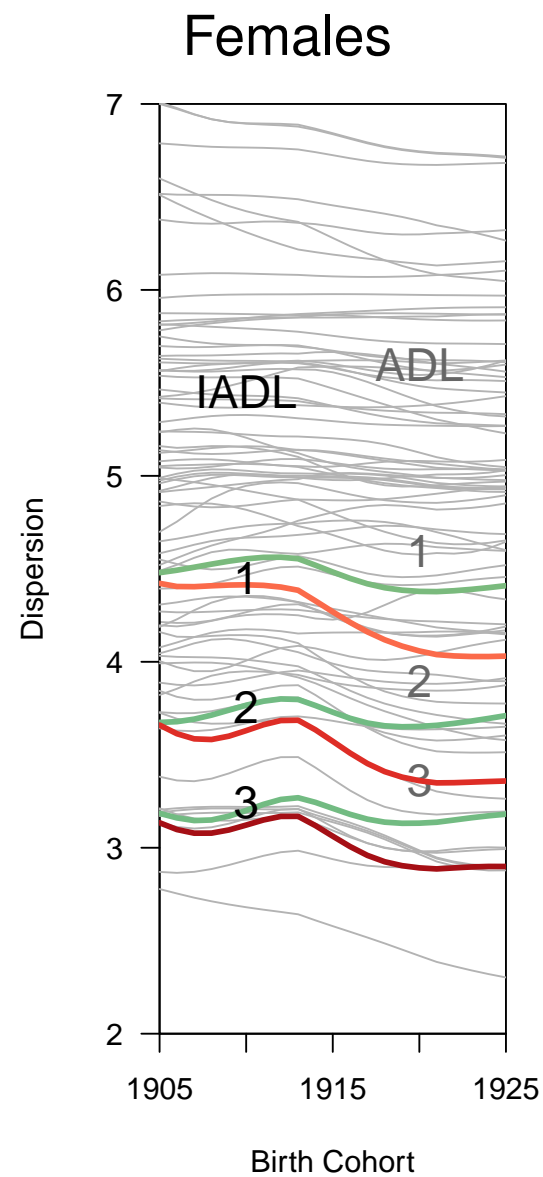
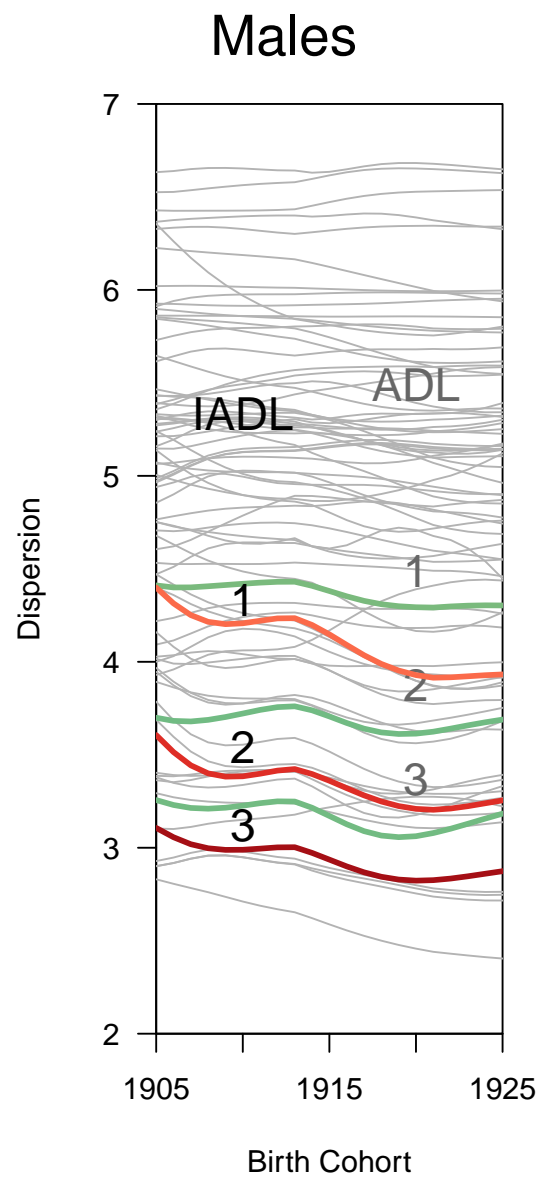


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Summary

Measures

Dispersion measures an aspect of the shape of morbidity prevalence, and it is a complementary index to compression.

Trends

Dispersion of most morbidities changed less than 10% between the 1905 and 1925 cohorts, mostly in the direction of increased concentration of poor health conditions at the end of life.

Limitations

This measure requires follow-up until death (but stable patterns might make prevalence less risky to extrapolate).



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