Modelling 2020 overall mortality

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Data

- Sources for overall deaths:

Source	# of populations	2020	
		Total # deaths	Mean # of age-groups
WHO	13	6.6	19
STMF	27	4.6	18
Statistical bureaus	7	4.0	78
Eurostat	9	1.3	19
UN PD	11	0.5	20
Totals	67	6.6	25

- Criteria for selecting sources/year:
  - 2020 must be available
  - 2015-2019 when coming from the same source
  - prioritize source coherence with respect to longer periods
  - preference for more detailed age-groups
- Sources for the exposures: UN WPP (single year of age)
- Age-range: 0-100
- Sexes combined

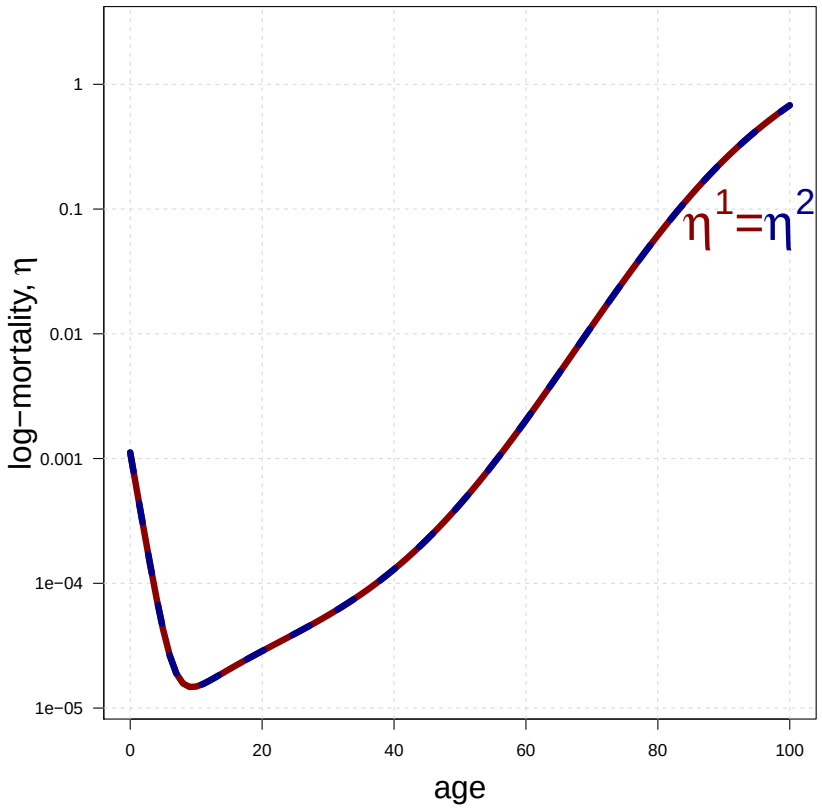
Model

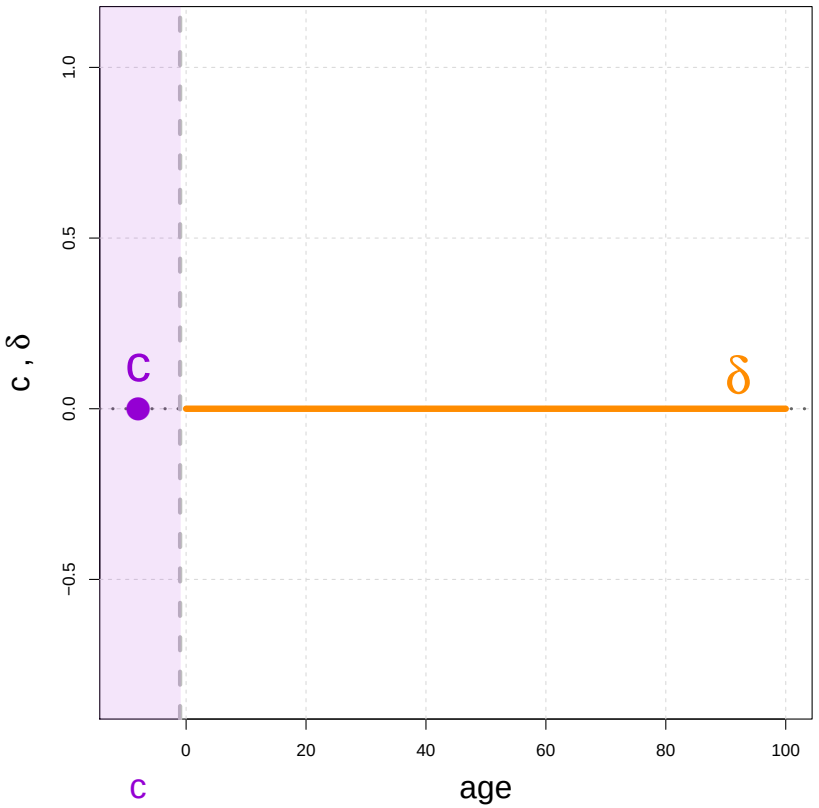
- For each population over age x, we have two mortality patterns:
  - $\eta^1(x)$ for the overall pre-pandemic years (sum up data < 2020)
  - $\eta^2(x)$ for 2020
- We model data in 2020 as follows:

$$\eta^2(x) = \eta^1(x) + c + \delta(x)$$

  - c scaling factor
  - $\delta(x) : \sum \delta(x) = 0$ age-dependent adjustment component
- Both $\eta^1(x)$ and $\delta(x)$ are assumed to be smooth

A schematically illustration





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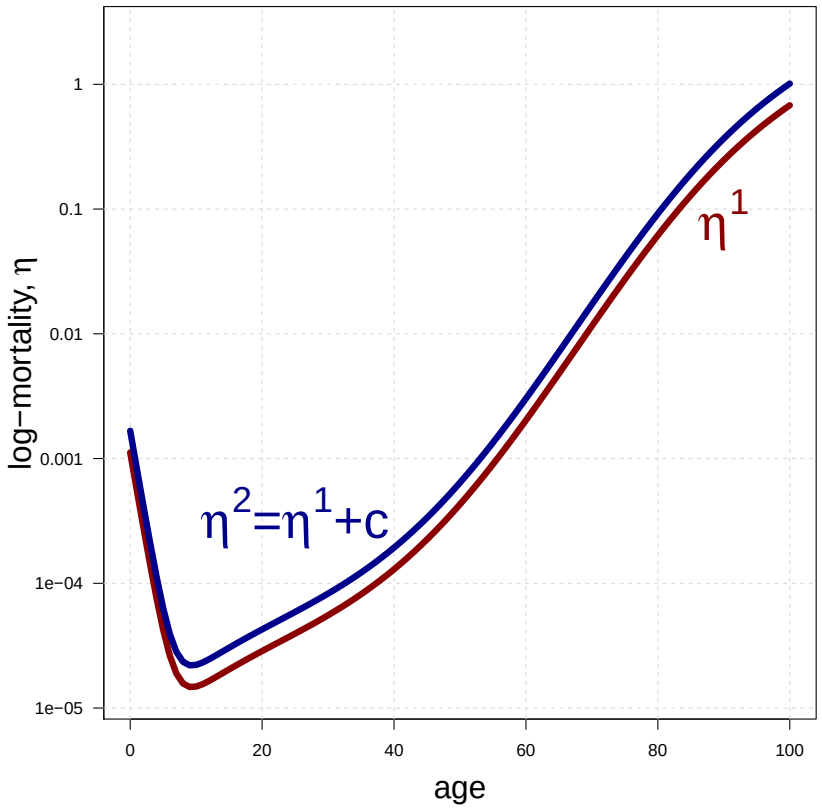

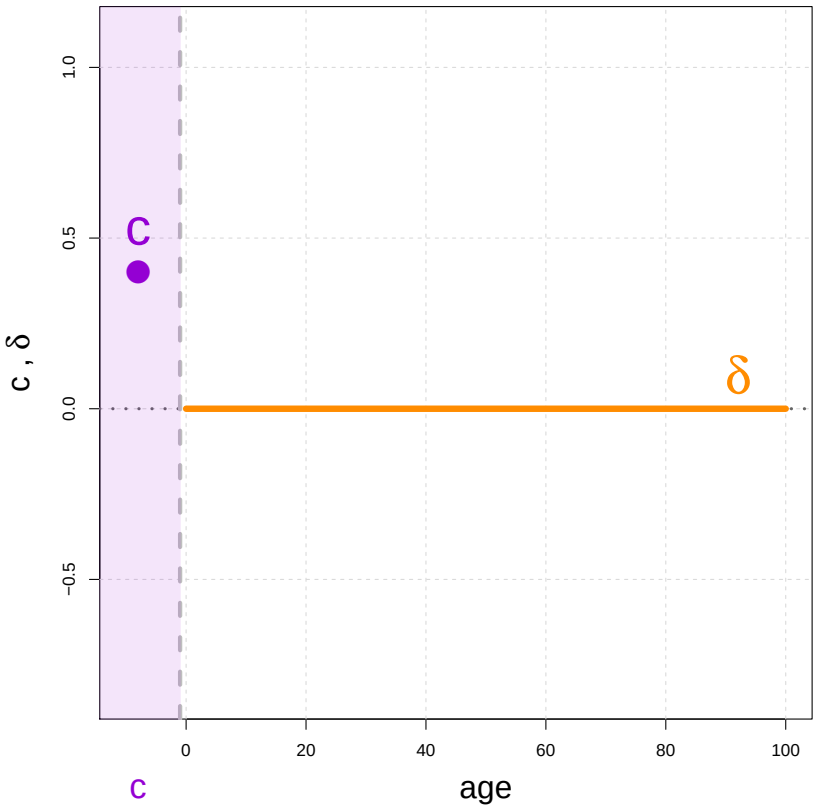

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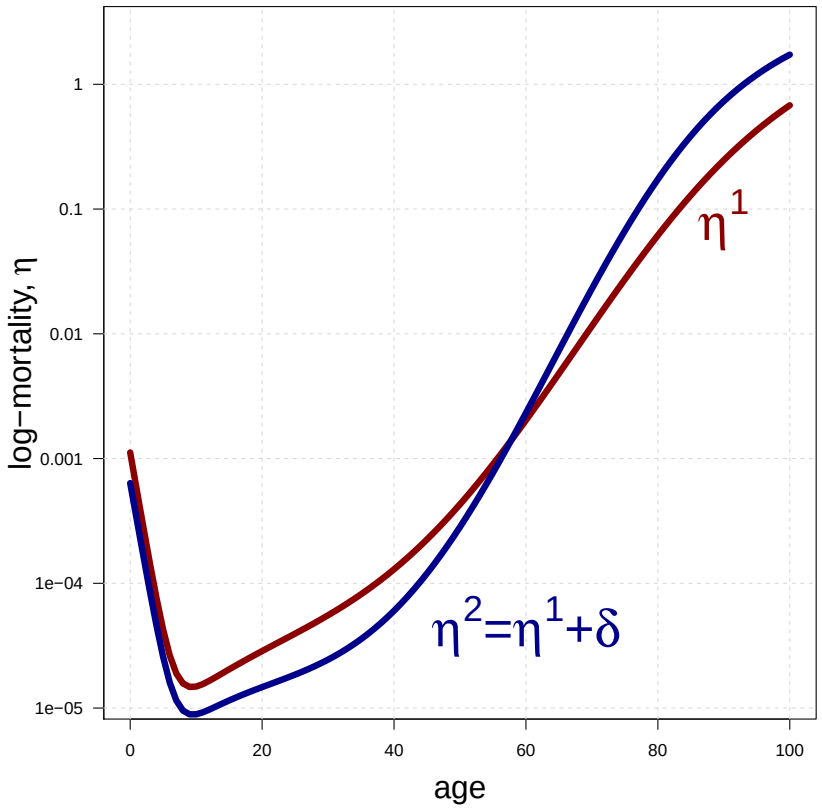

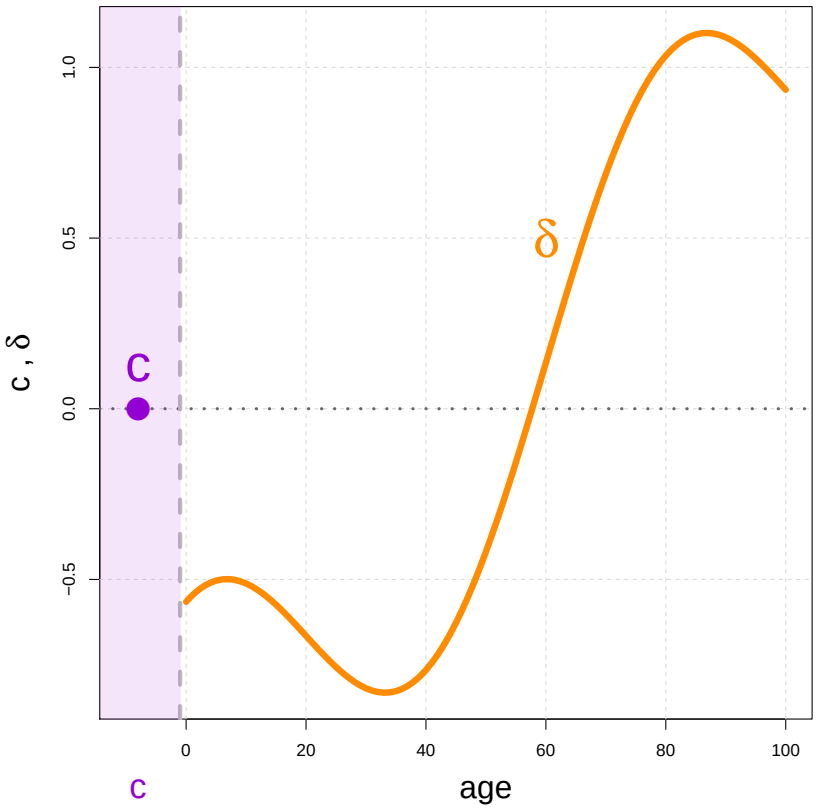

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