

KOSTAT-UNFPA Summer Seminar on Population

Workshop 1: Demographic Analysis: Methods and Tools in R

# Population Structure

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**ikerbasque**  
Basque Foundation for Science



Statistics  
Korea



# Workshop plan, July 1-5, 2024

1: Monday      Intro concepts, and R setup

2: Tuesday   Mortality and fertility

**3: Wednesday      Structure**

4: Thursday      Growth

5: Friday      Projection

# Review of session 2

- Period synthetic cohorts
- Lifetable deaths versus observed deaths
- Weighted averages ( $e_0$ , MAB)
- Function-writing:

```
new_name <- function(arguments) {  
  # code that does stuff  
  return(result)  
}
```

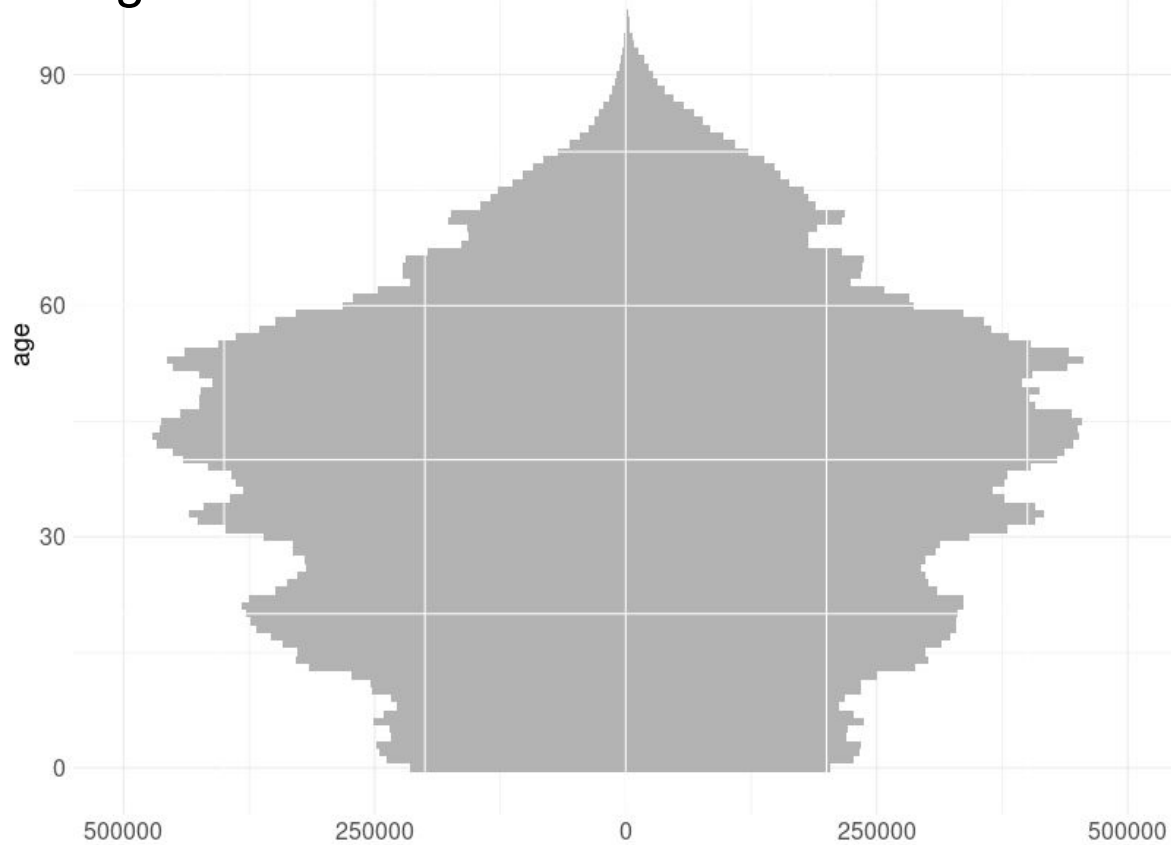
- **Grouped data**

```
group_by() |>
```

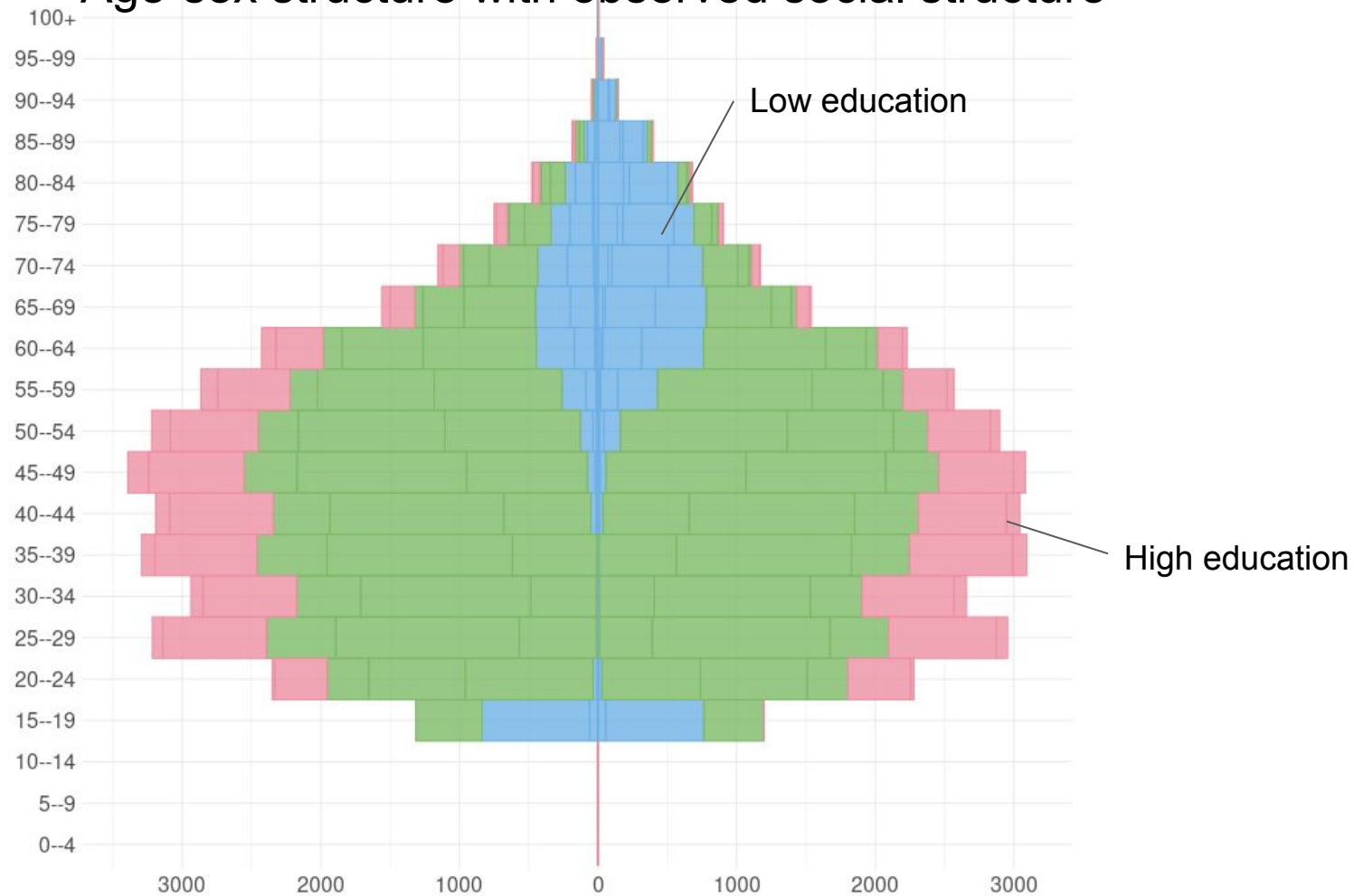
# Structure

- Population subsets, usually exclusive strata (sex, location, status, etc)
- Risk categories within populations considered together, such as age, health, or otherwise blended populations
- Unobserved structure (e.g. underlying frailty, remaining time-to-death, social advantage)

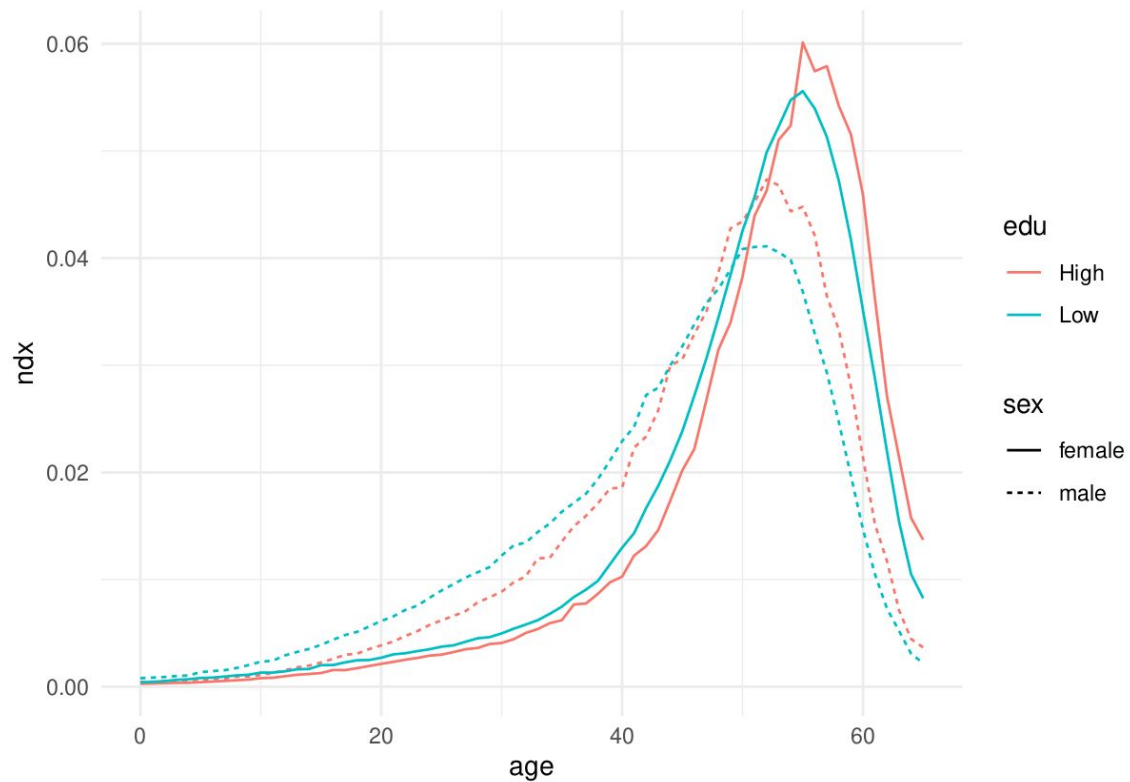
# Age-sex structure



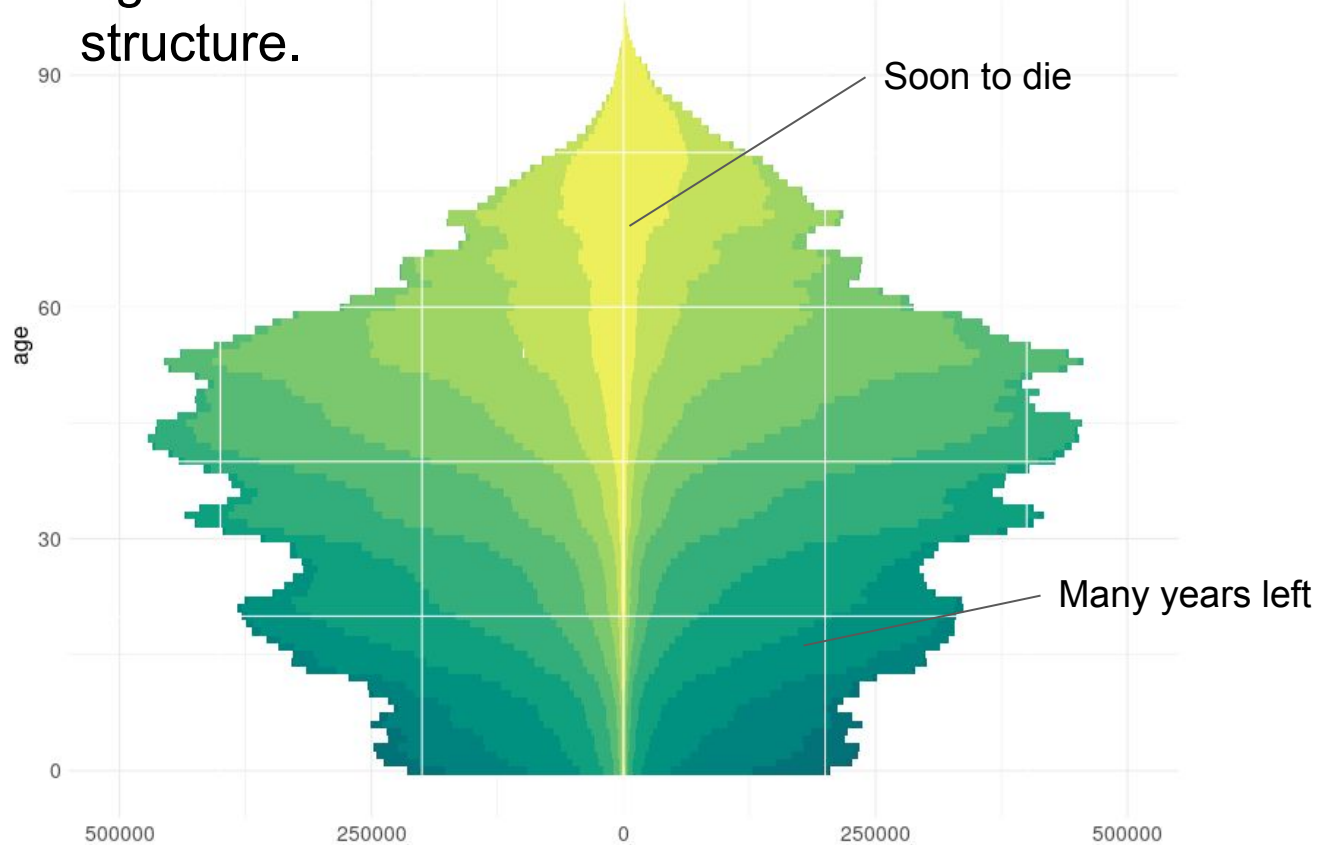
# Age-sex structure with observed social structure



# Age-sex structure to reveal inequalities

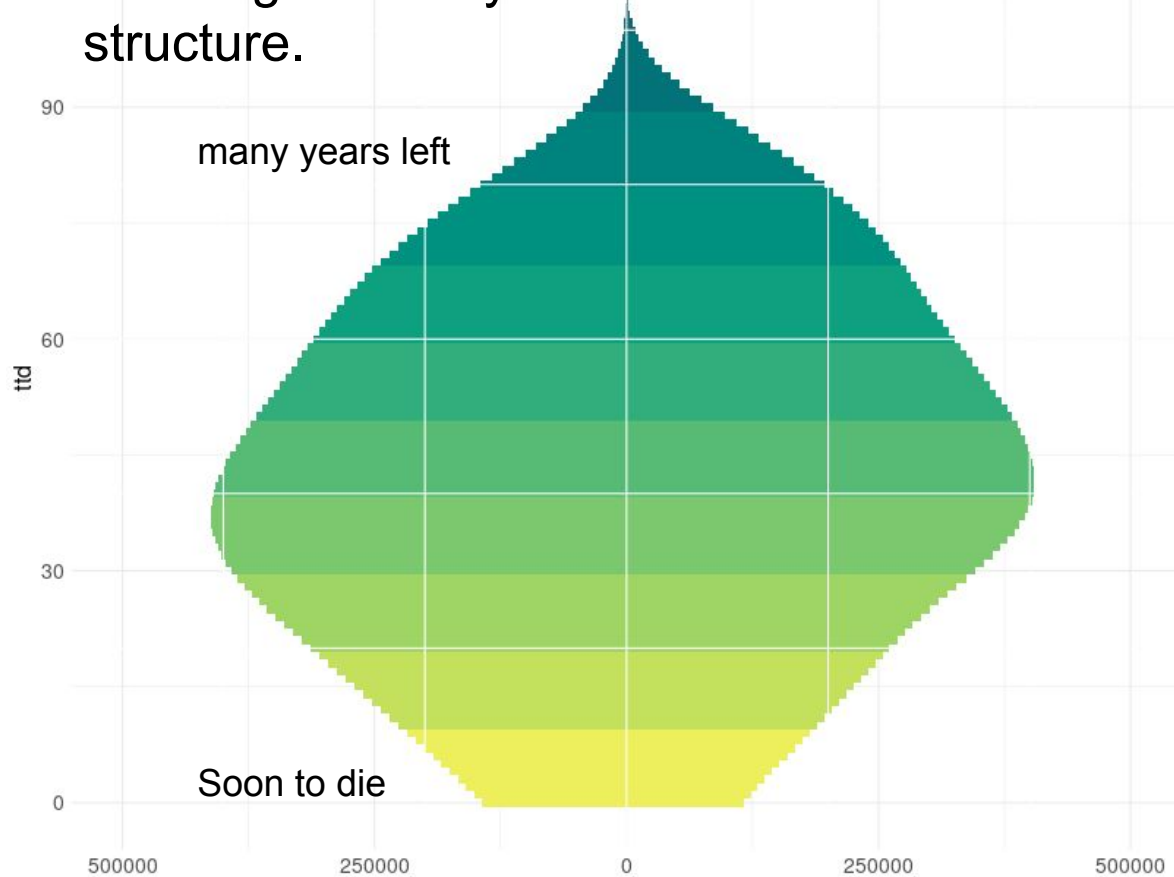


Age structure with unobserved time-to-death structure.

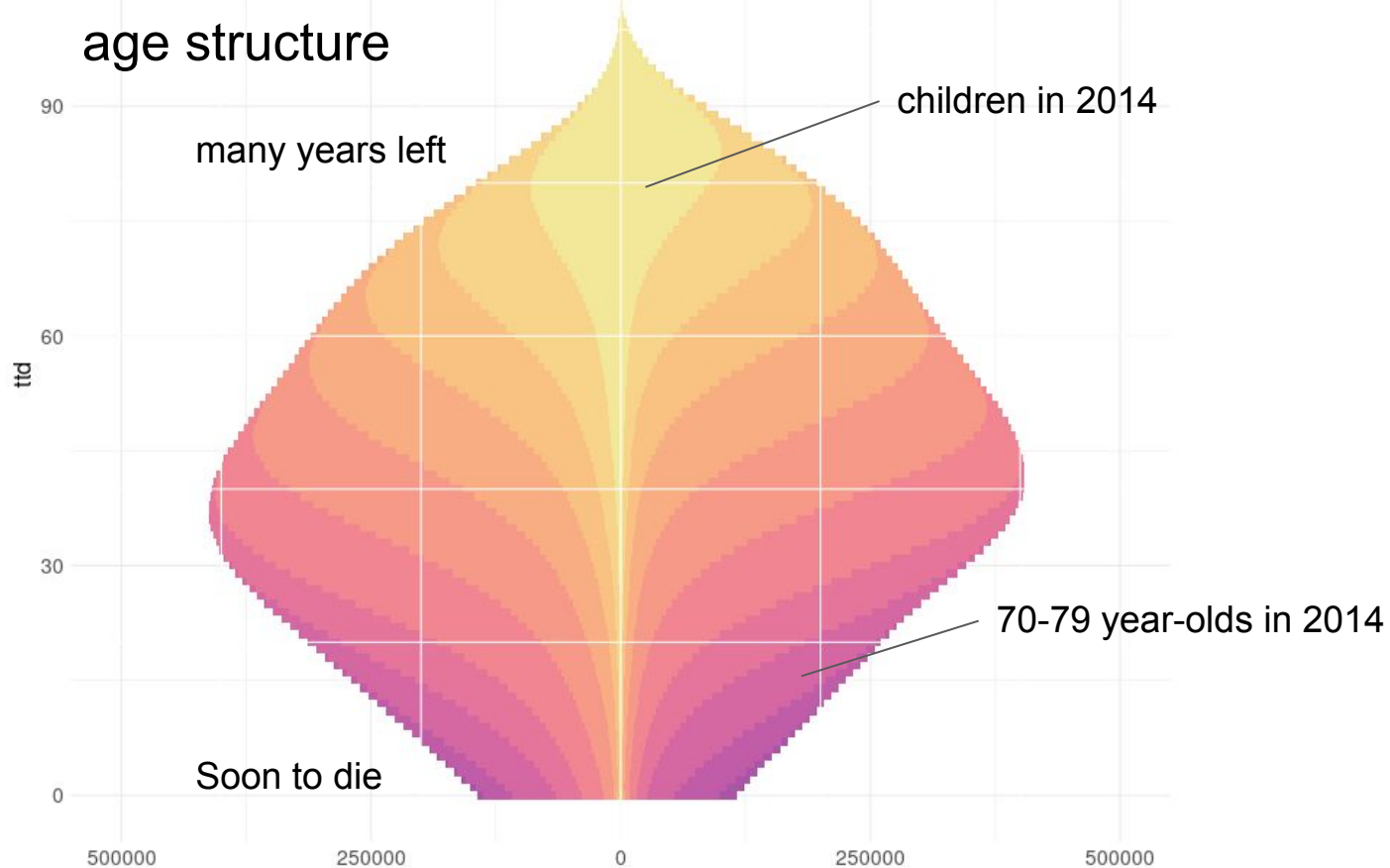




...Reorganized by unobserved time-to-death structure.



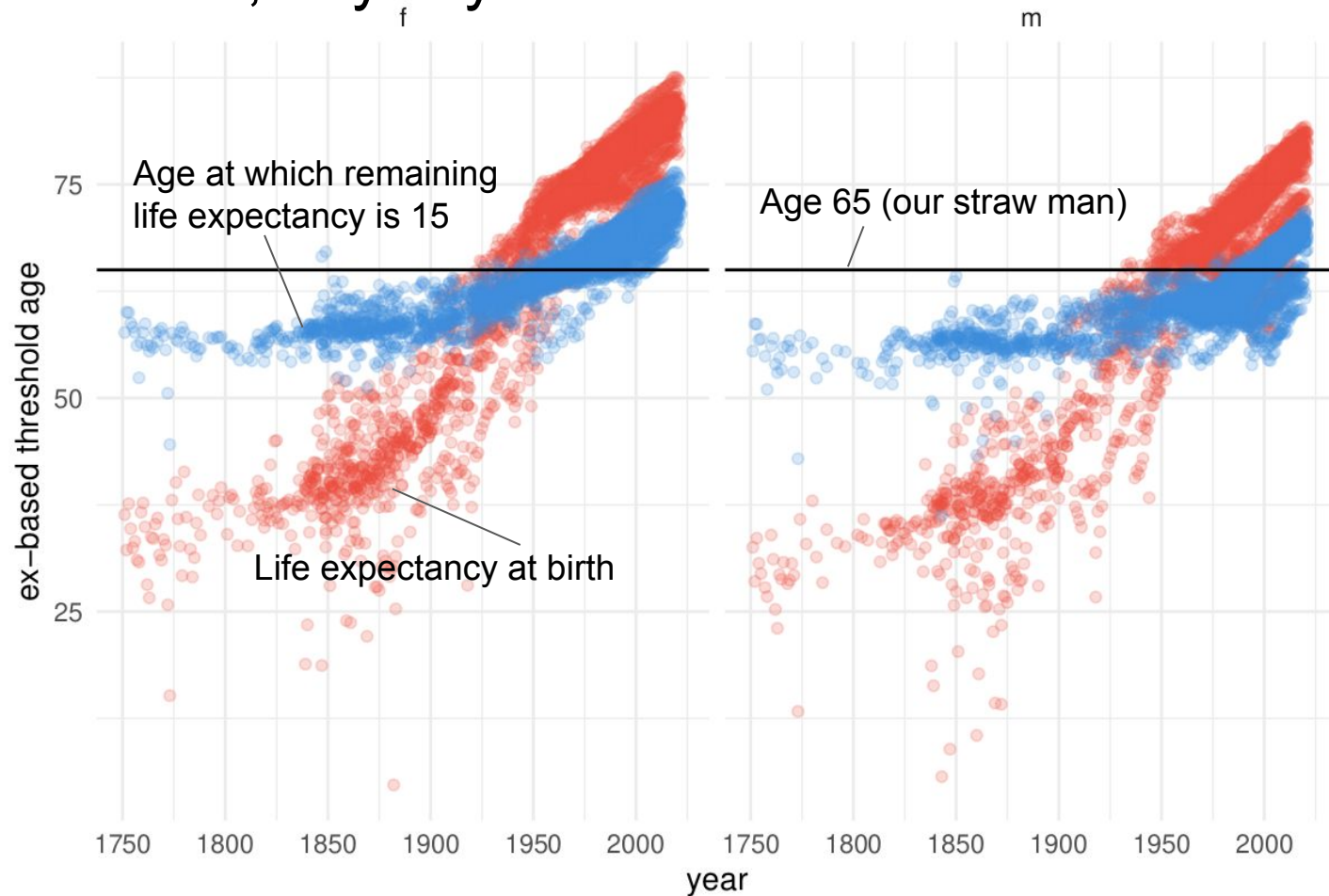
# Unobserved time-to-death structure with observed age structure



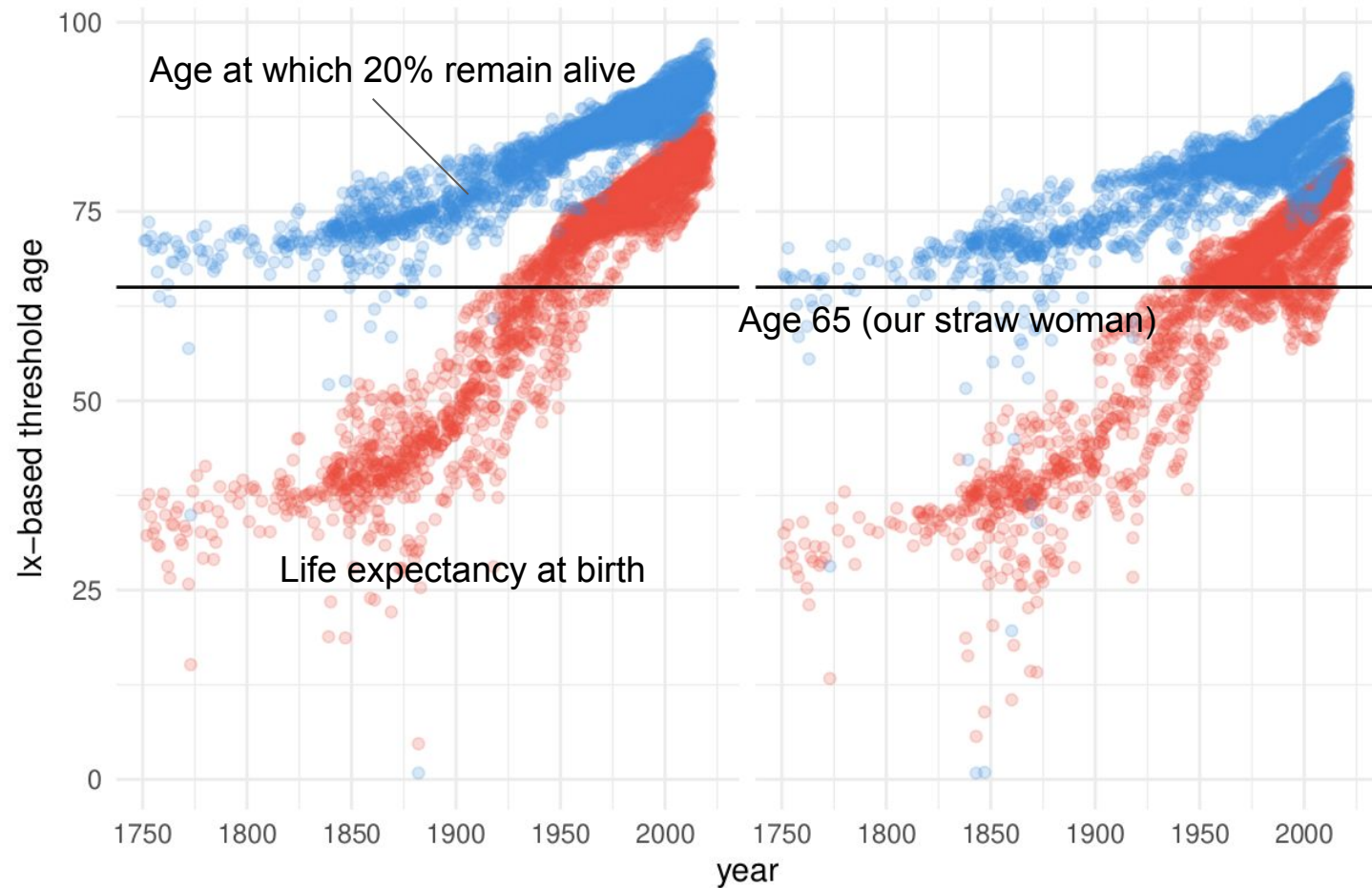
# What is old, anyway?

- What if we say old starts at the age where remaining life expectancy drops to 15 or similar?
- Or what if we say old starts when only 20% of a cohort remains alive?

# What is old, anyway?

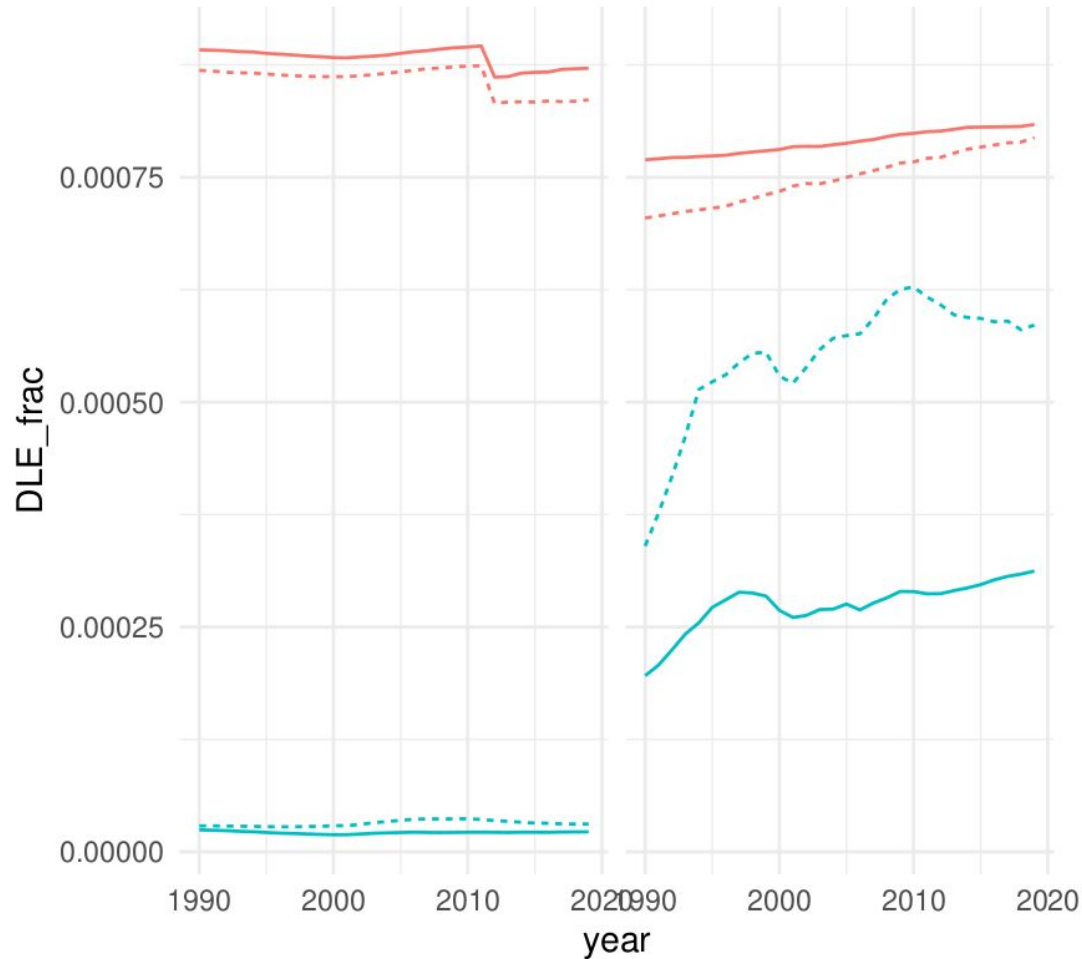


## m



Kenya

Republic of Korea



Different measures =  
Different “burdens”

sex

— Female

- - - Male

cause

— Seborrhoeic dermatitis

— Stomach cancer

# Structure

- measure inequality vs
- control for heterogeneity?
- Fixed versus transient structure
- Observed and unobserved structure
- Structure and the lifecycle