

ESTIMATES OF COVID-19 EXCESS DEATHS IN NEW ZEALAND THAT PROPERLY ACCOUNT FOR DEMOGRAPHIC TRENDS

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OBJECTIVES

Obtain new estimates for excess deaths in Aotearoa New Zealand during the COVID-19 epidemic that

- account for differences by age, sex, and season,
- include measures of uncertainty, and
- are easy to replicate.

BACKGROUND

- New Zealand closed borders and imposed strict lockdowns during COVID-19
- Debate over number of excess deaths
- Existing estimates do not properly account for demographic trends, e.g. age-sex differentials, pre-existing trends, seasonal effects, population change

DATA

- Population by 5-year age group, sex, month, 1998–2023, from Statistics New Zealand
- Deaths by 5-year age group, sex, month, 1998–2023, from Statistics New Zealand

STATISTICAL MODEL

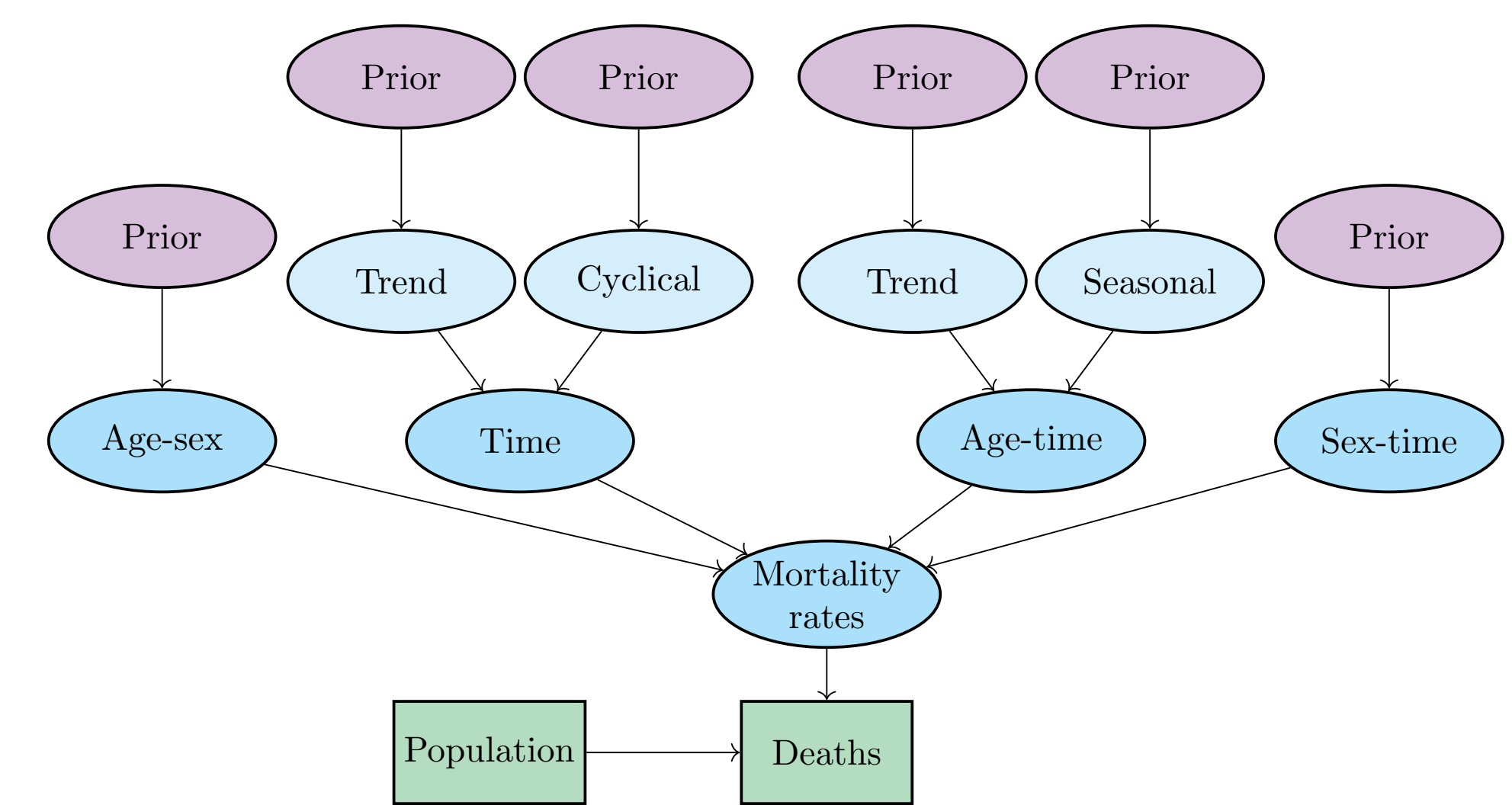


Figure 1: Bayesian hierarchical model used for estimation and forecasting

FORECASTS OF RATES

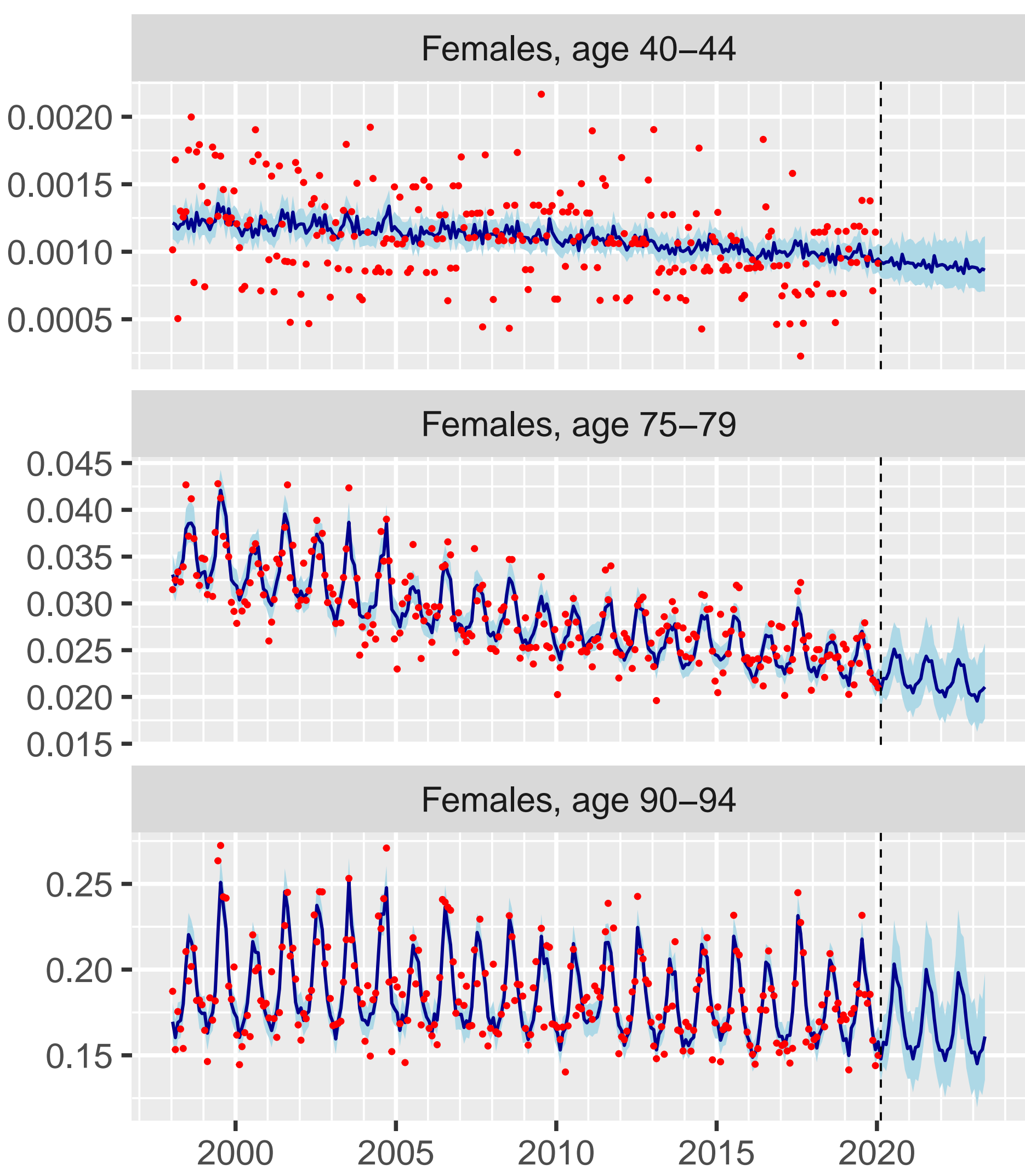


Figure 2: Estimates and forecasts of mortality rates for selected groups. Blue lines and bands are point estimates and 95% credible intervals from model. Red dots are direct estimates.

EXCESS DEATHS BY AGE

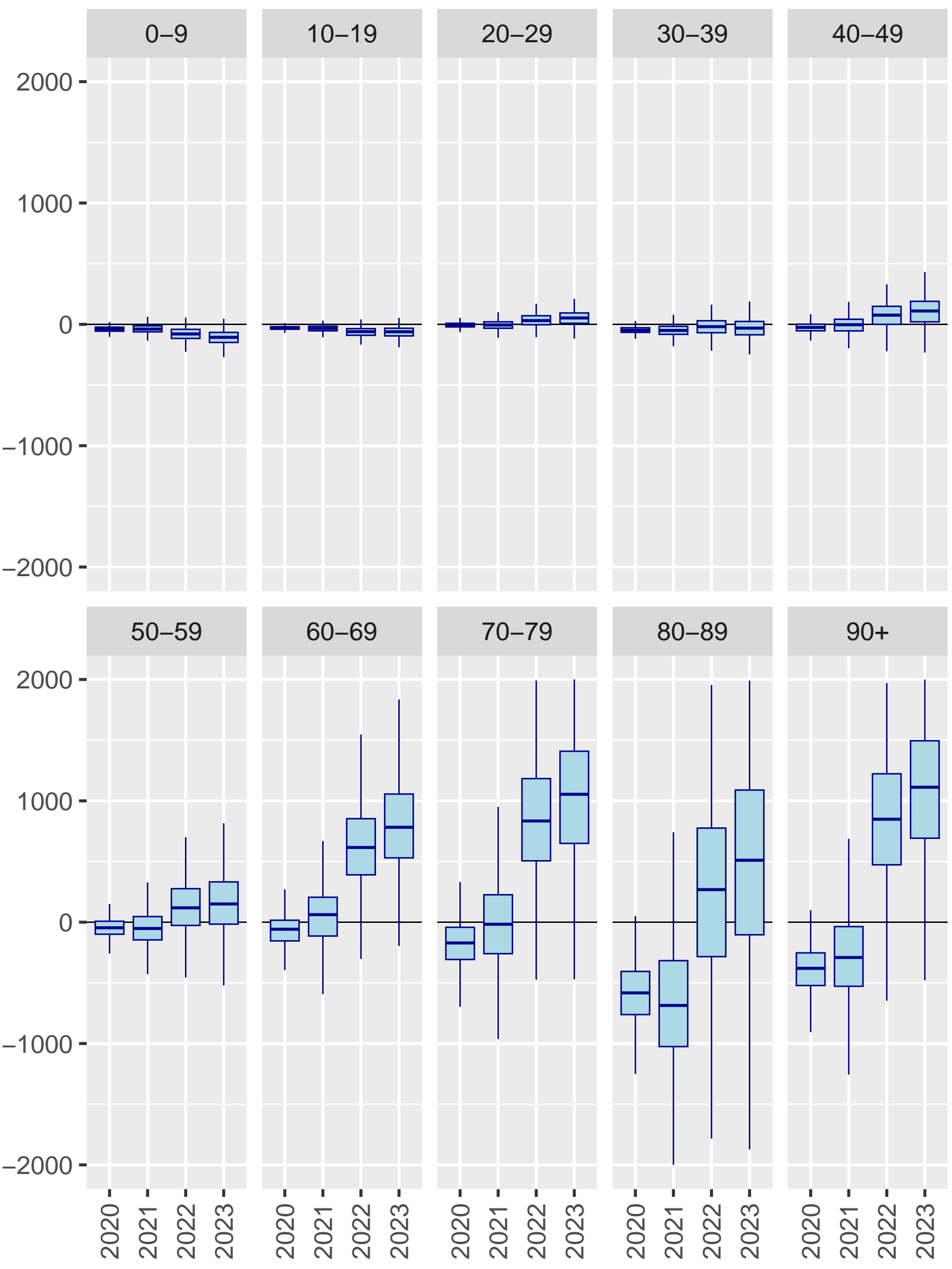


Figure 3: Cumulative excess deaths, by age group, by year. Note that data for 2023 are incomplete.

LIFE EXPECTANCY

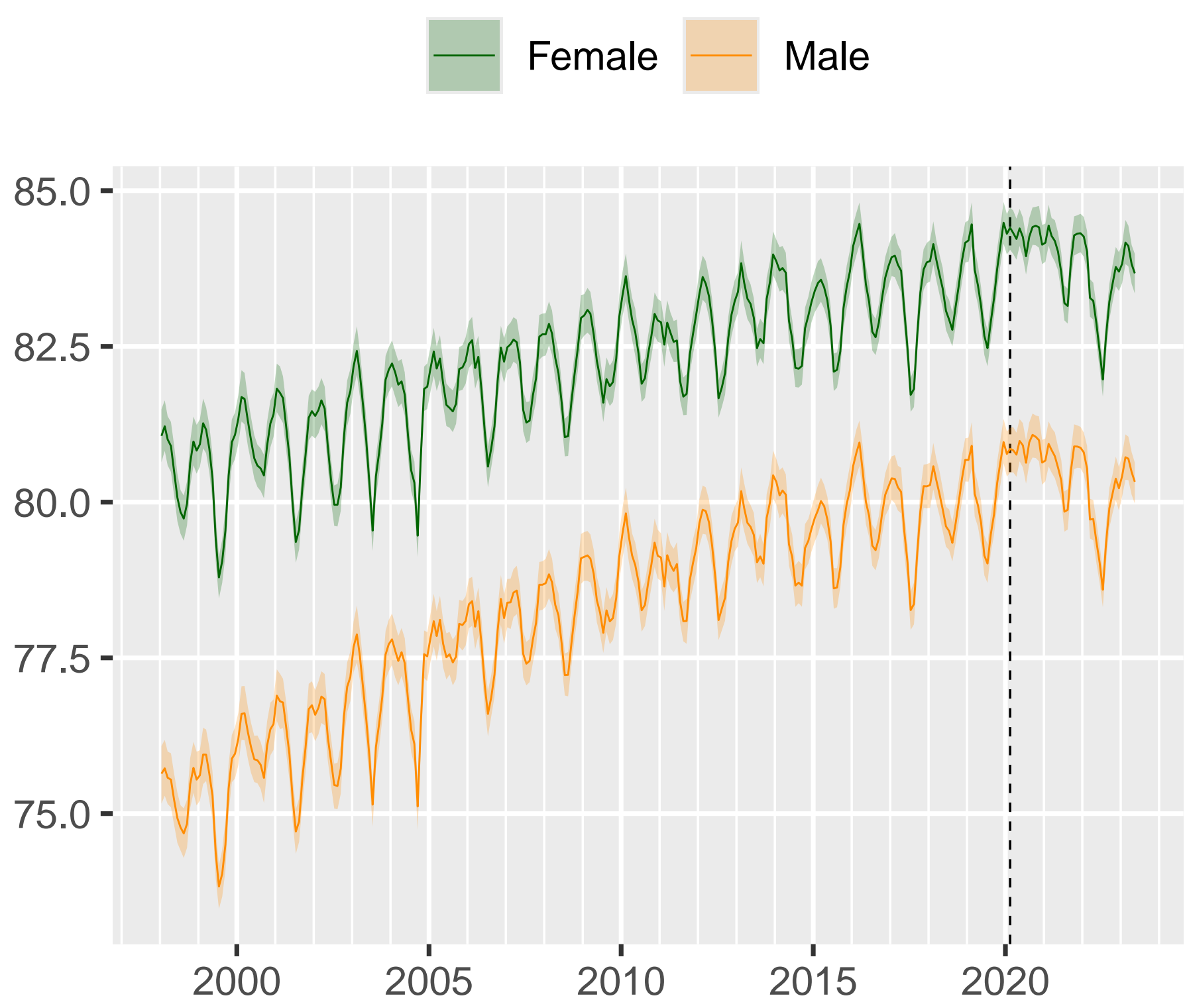


Figure 5: Estimates of life expectancy at birth, from model fitted to data for 1998–2023

CONCLUSION

- Monthly excess deaths between -500 and 1000, with 2022–2023 higher than 2020–2021
- Excess deaths concentrated among older people

NOTES

- Work in progress, and results are provisional
- Statistical models implemented using R package **bage**

CONTACT INFORMATION

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EXCESS DEATHS

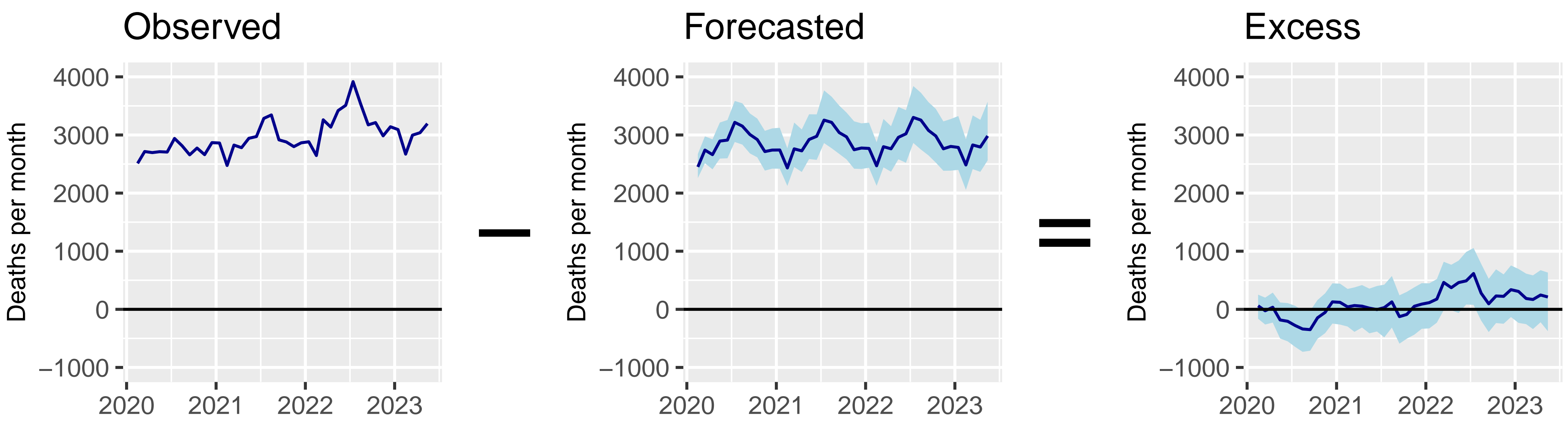


Figure 4: Calculation of monthly excess deaths: forecasted deaths are subtracted from actual deaths