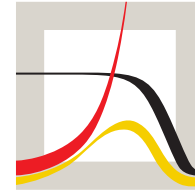




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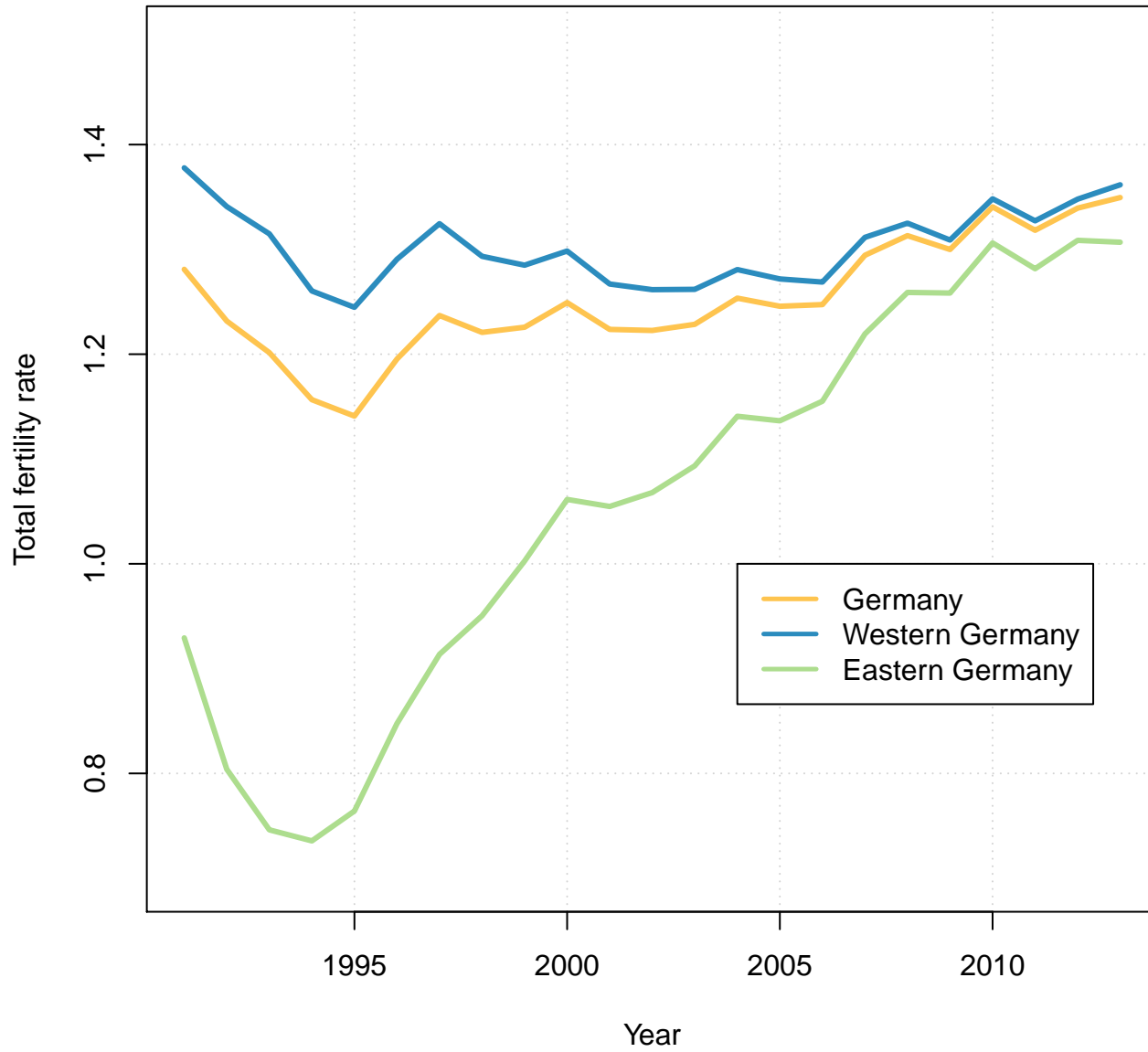
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Male fertility in eastern and western Germany since 1991

Christian Dudel & Sebastian Klüsener

Male fertility in Germany 1991–2013





Outline

Data

Method

Robustness checks

Findings



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Age-specific fertility rates

$$f_{a,t}^m = \frac{B_{a,t}^m}{PY_{a,t}^m}$$

$B_{a,t}^m$: Births in year t to fathers aged a

$PY_{a,t}^m$: Person years lived in year t by men aged a



Data: Person years

Adjusted intercensal population estimates for Germany by Klüsener et al. (2016)



Data: Births

“Statistik der Geburten”

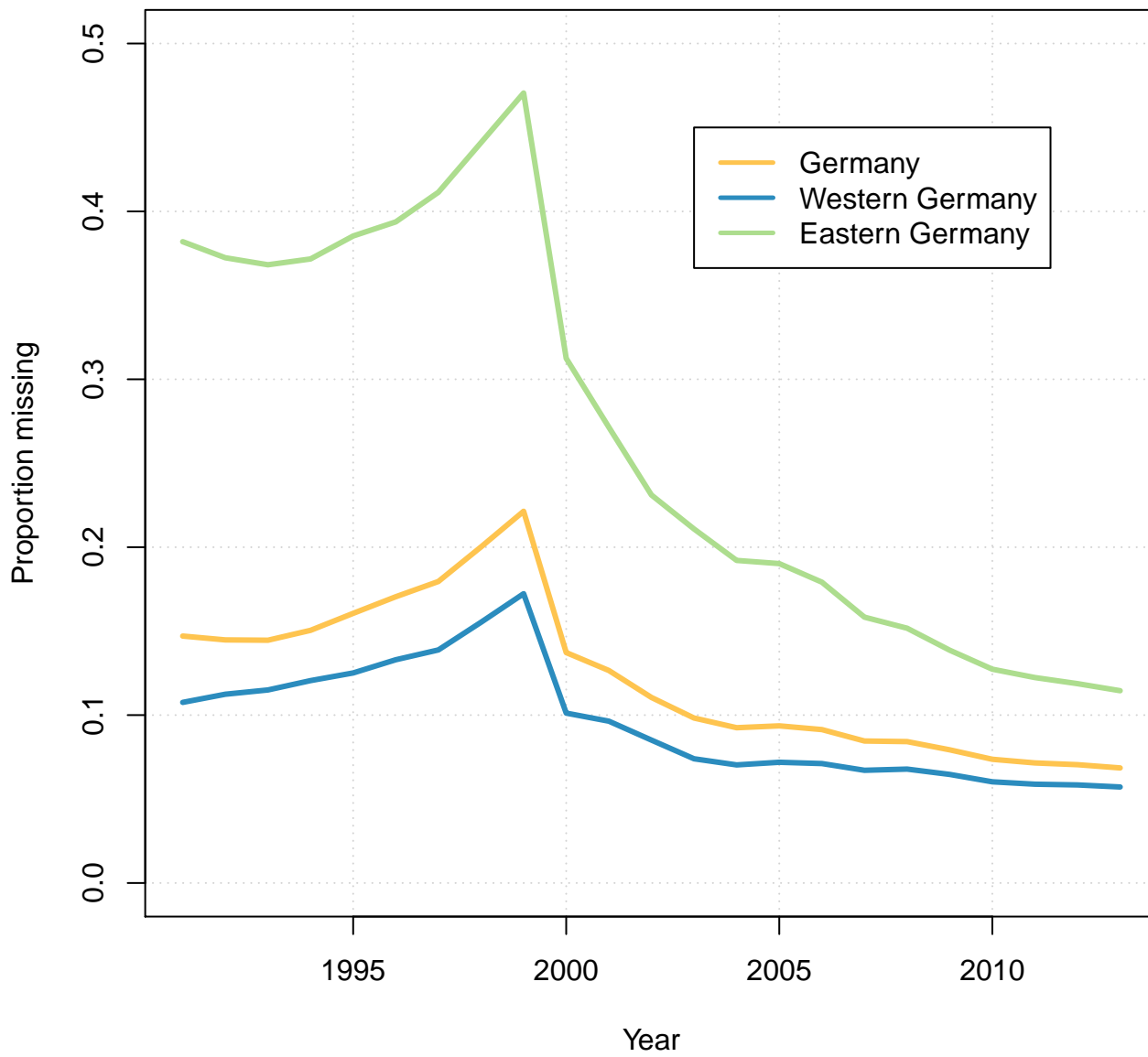
- German birth register
- Covers all births to mothers who are permanent residents in Germany
- Available for 1991-2013
- 16,803,484 live births
- Includes information on age of mother and father:
 - Age of mother is known for all births
 - Age of father is only known for some births



Births: Age of father

- *Always* recorded for marital births
- Before 2000 not available for non-marital births
- Since 2000 also for non-marital births on a voluntary basis

Missing age of father 1991–2013





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Robustness checks

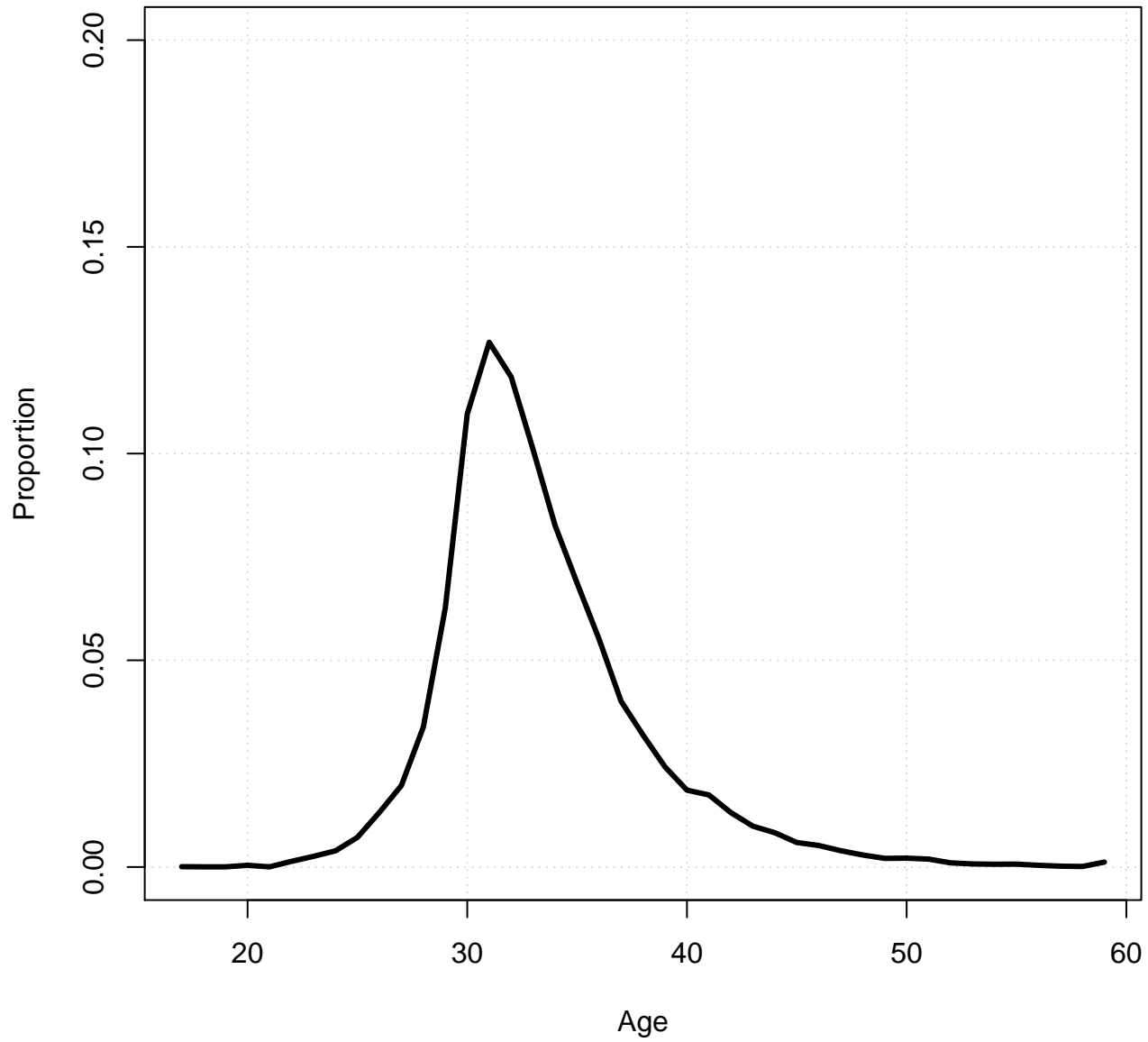
Findings



Age of father: Solution

- Assumption: Age of father is missing at random conditional on age of mother
- Births with missing age of father are distributed according to the observed distribution of the age of the father conditional on age of the mother

Age of father (mother aged 30), western Germany 2013





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Robustness checks

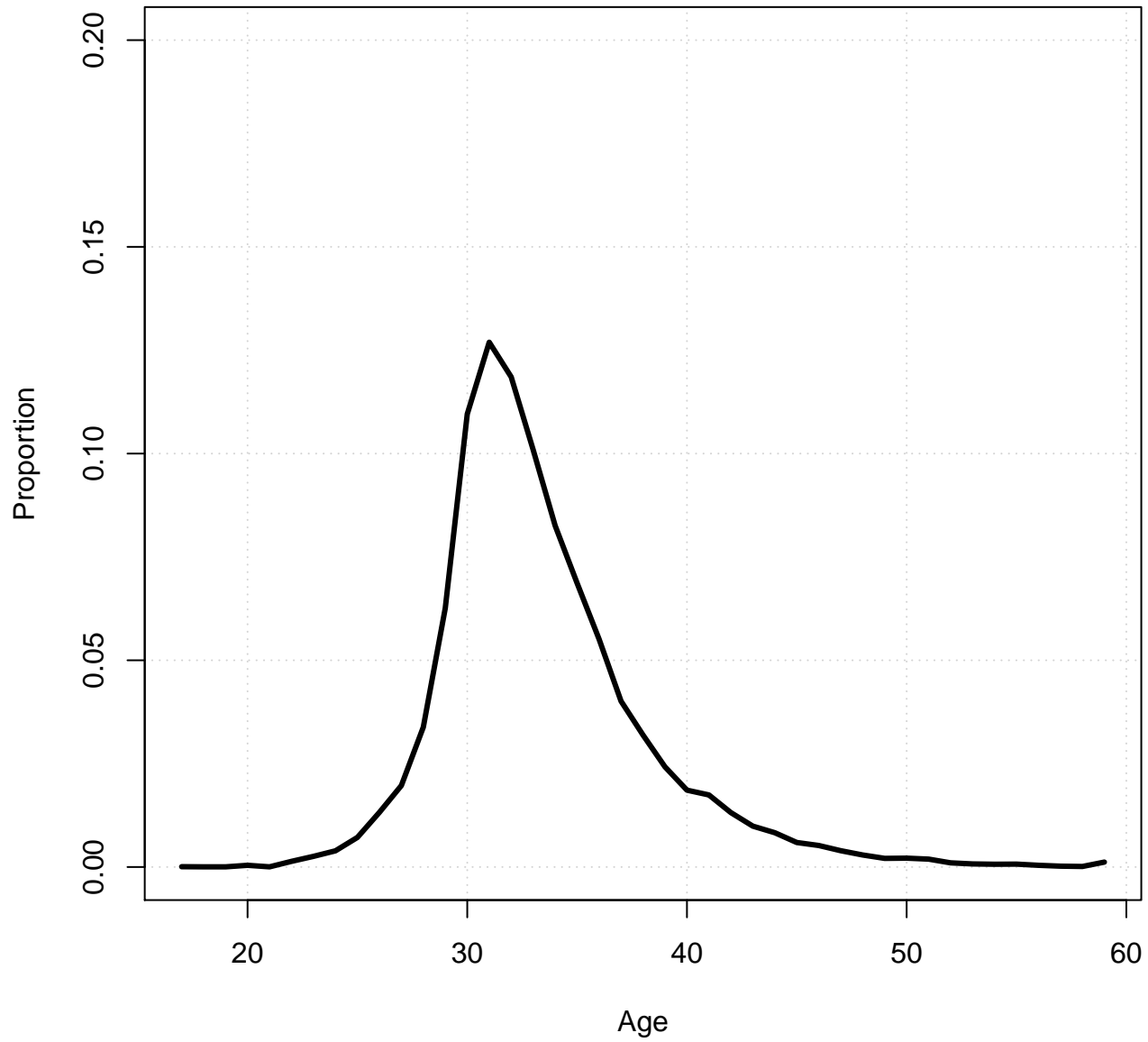
1. (More elaborate imputation methods: Regression, matching, distribution-based)
2. Sensitivity analysis



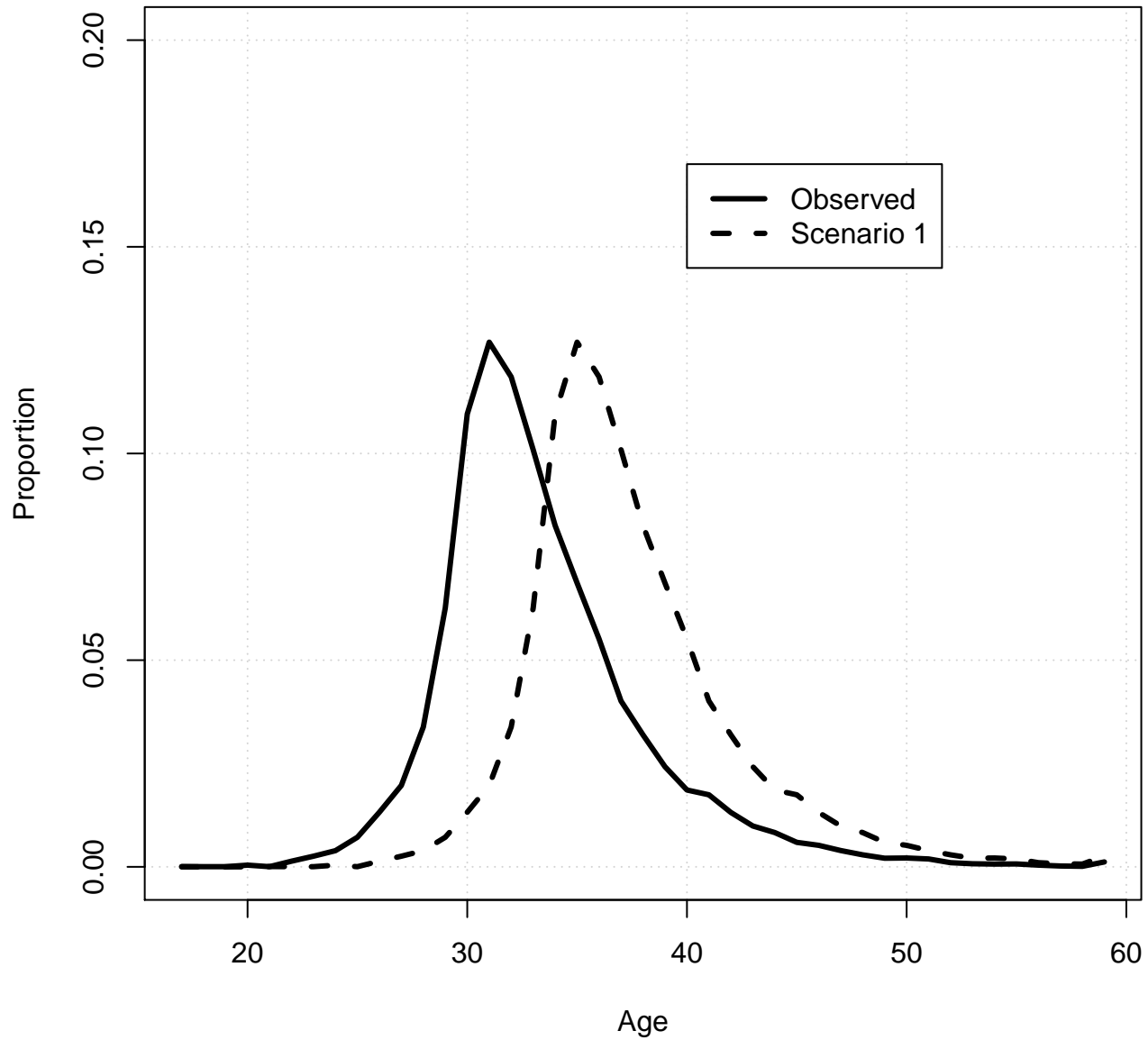
Sensitivity analysis

- Average age difference between father and mother: 3 and 4 years
- Two scenarios for births with missing age of father
- Scenario 1: Average age difference of ≈ 7.5 years
- Scenario 2: Average age difference of ≈ -0.5 years

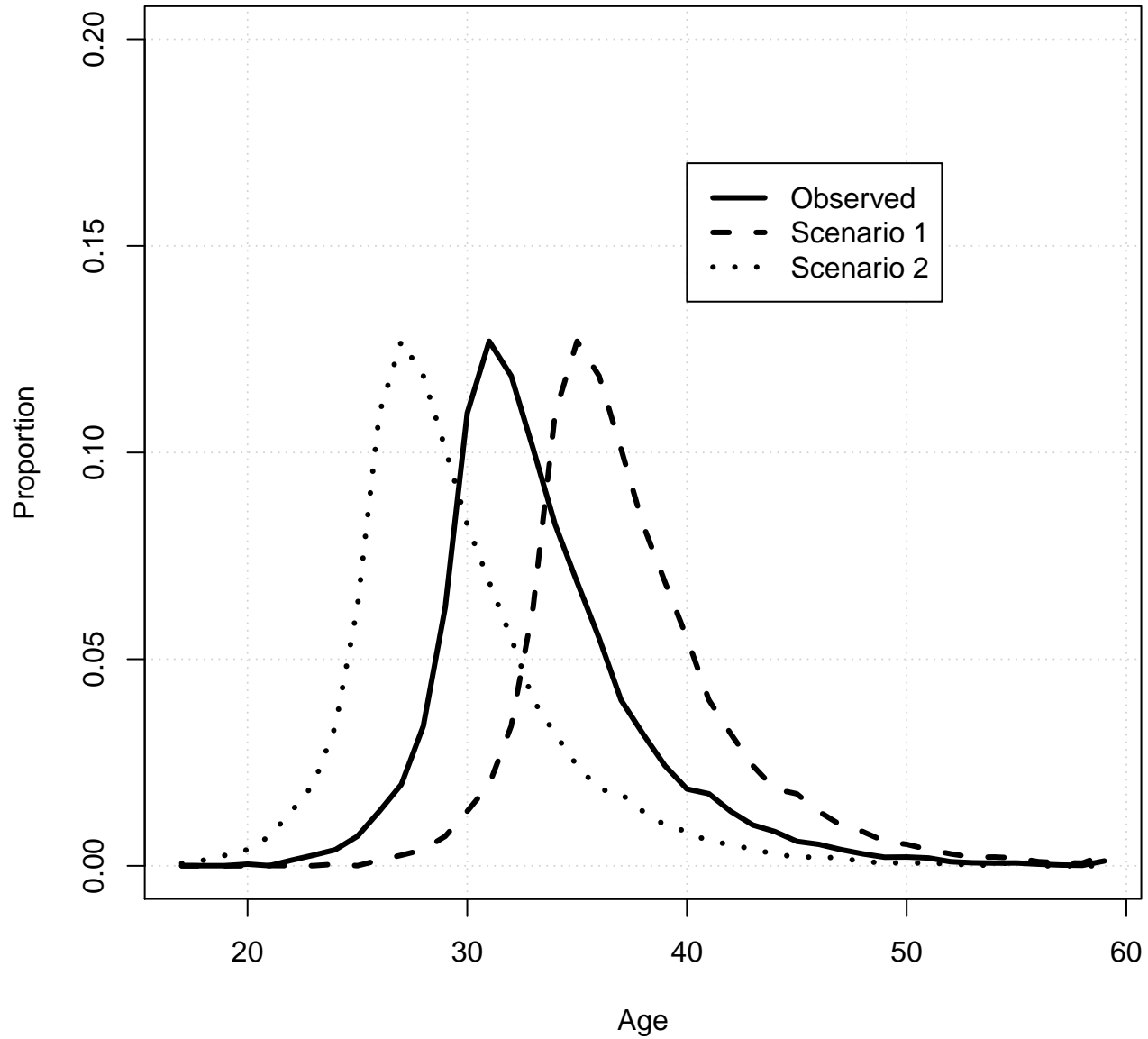
Age of father (mother aged 30), western Germany 2013



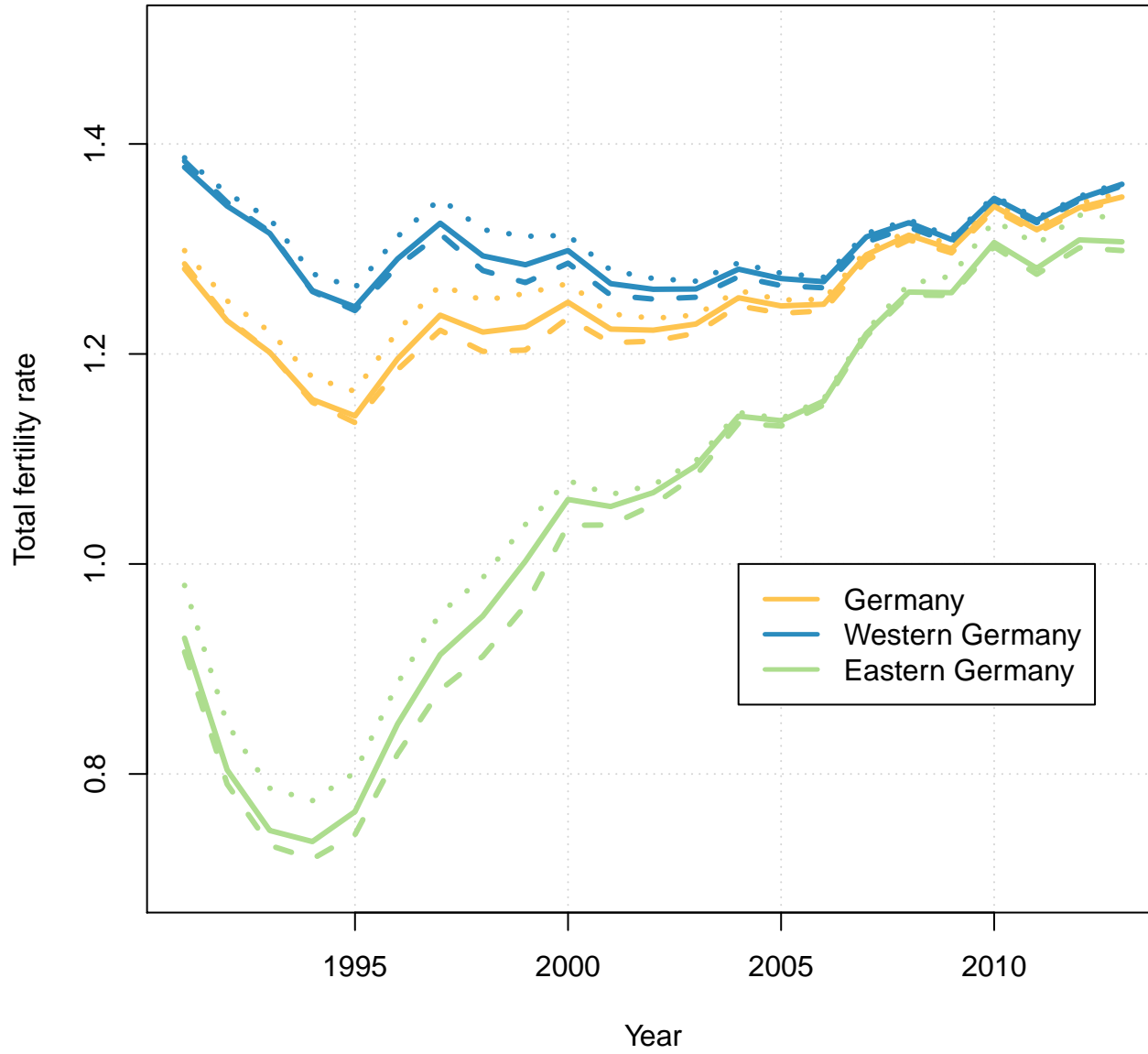
Age of father (mother aged 30), western Germany 2013



Age of father (mother aged 30), western Germany 2013



Results sensitivity analysis





Outline

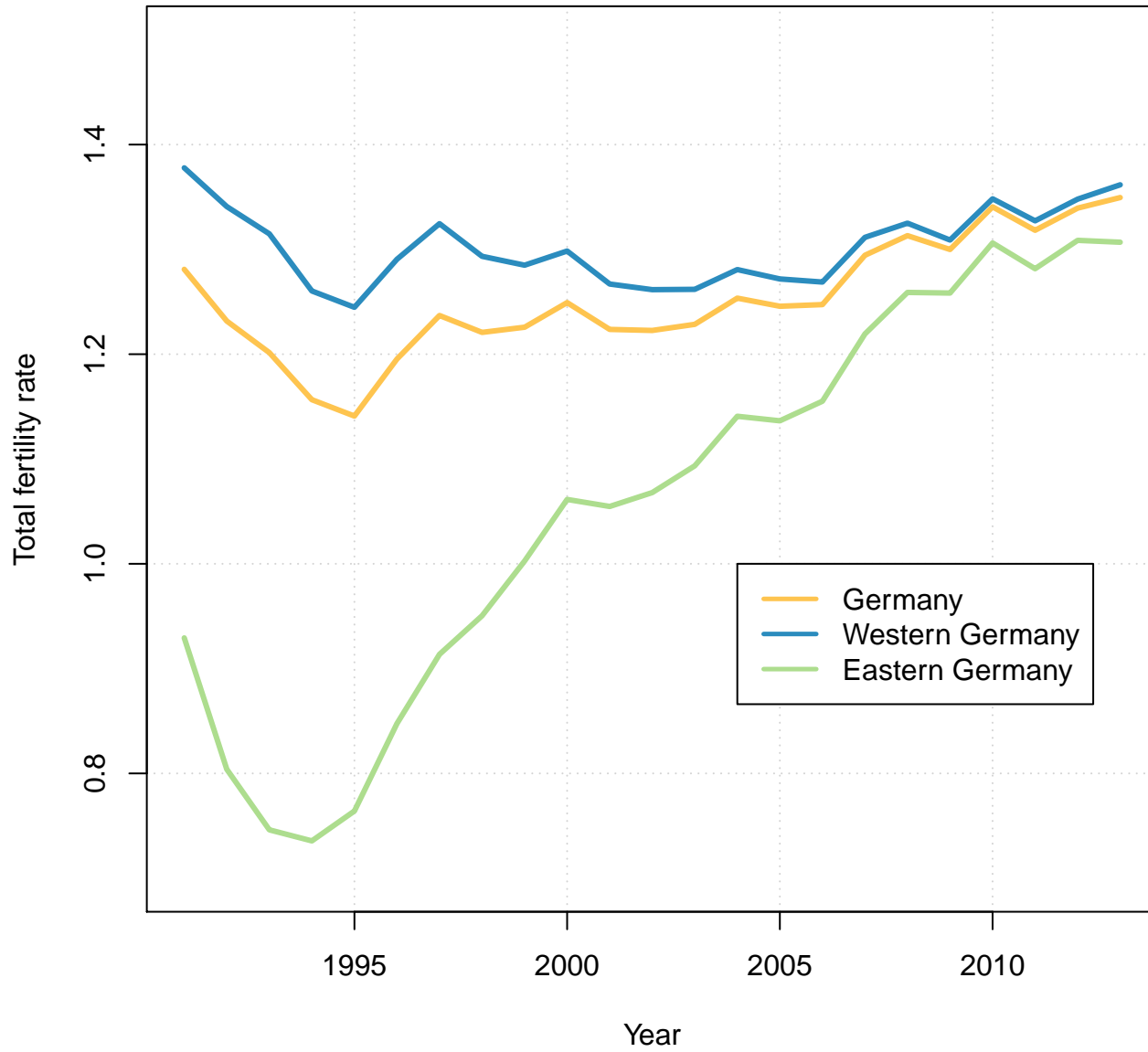
Data

Method

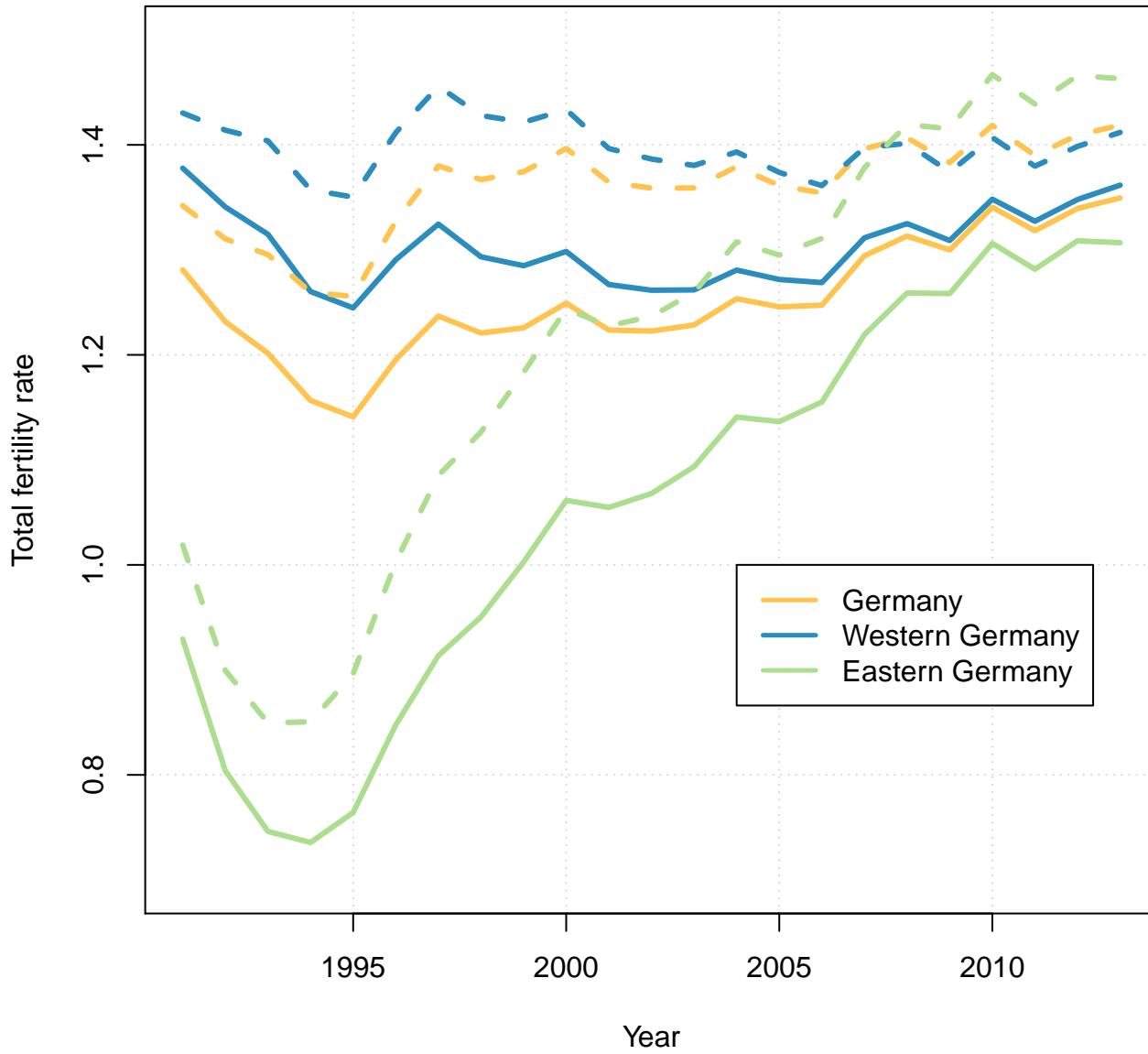
Robustness checks

Findings

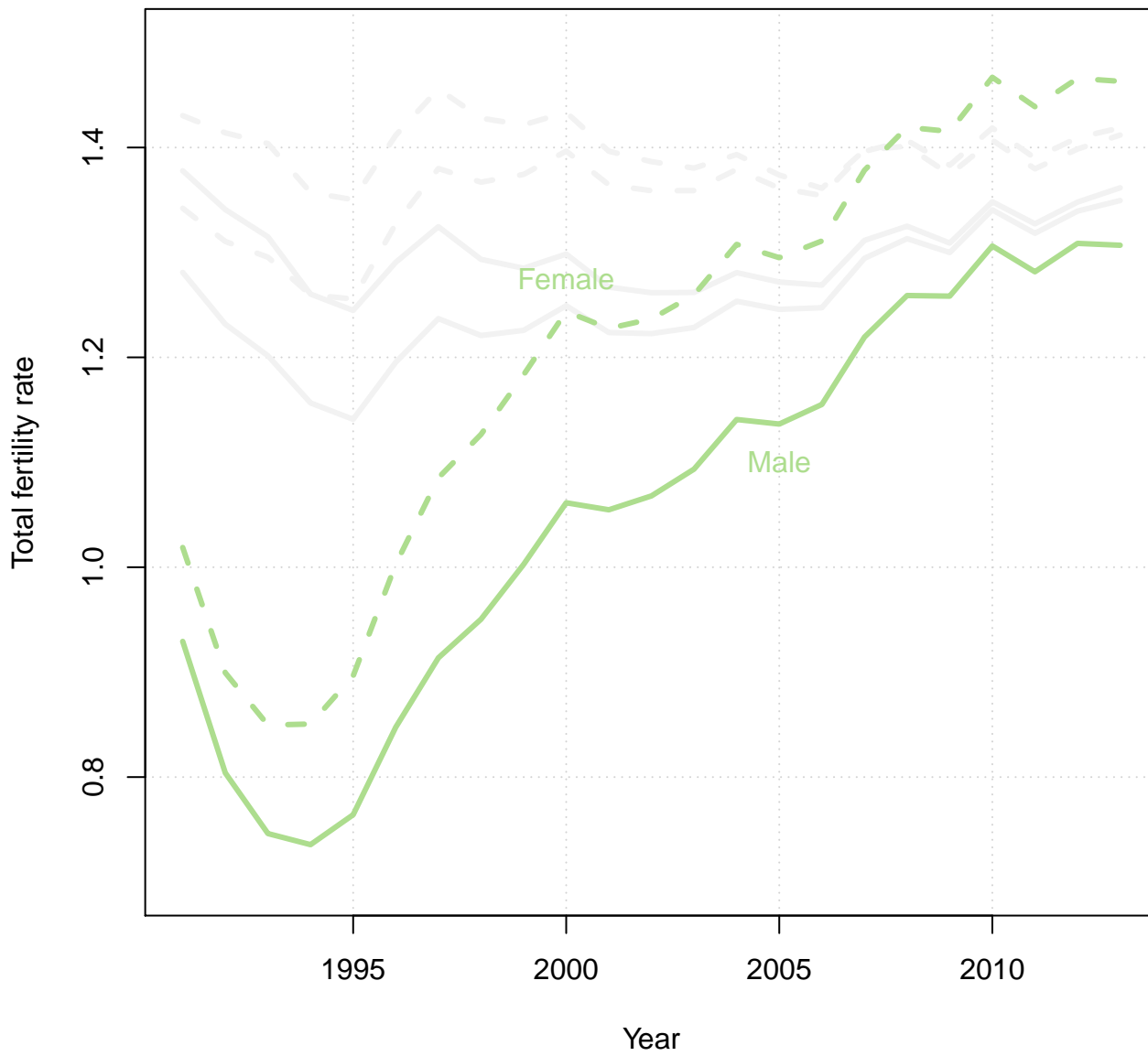
Male fertility in Germany 1991–2013



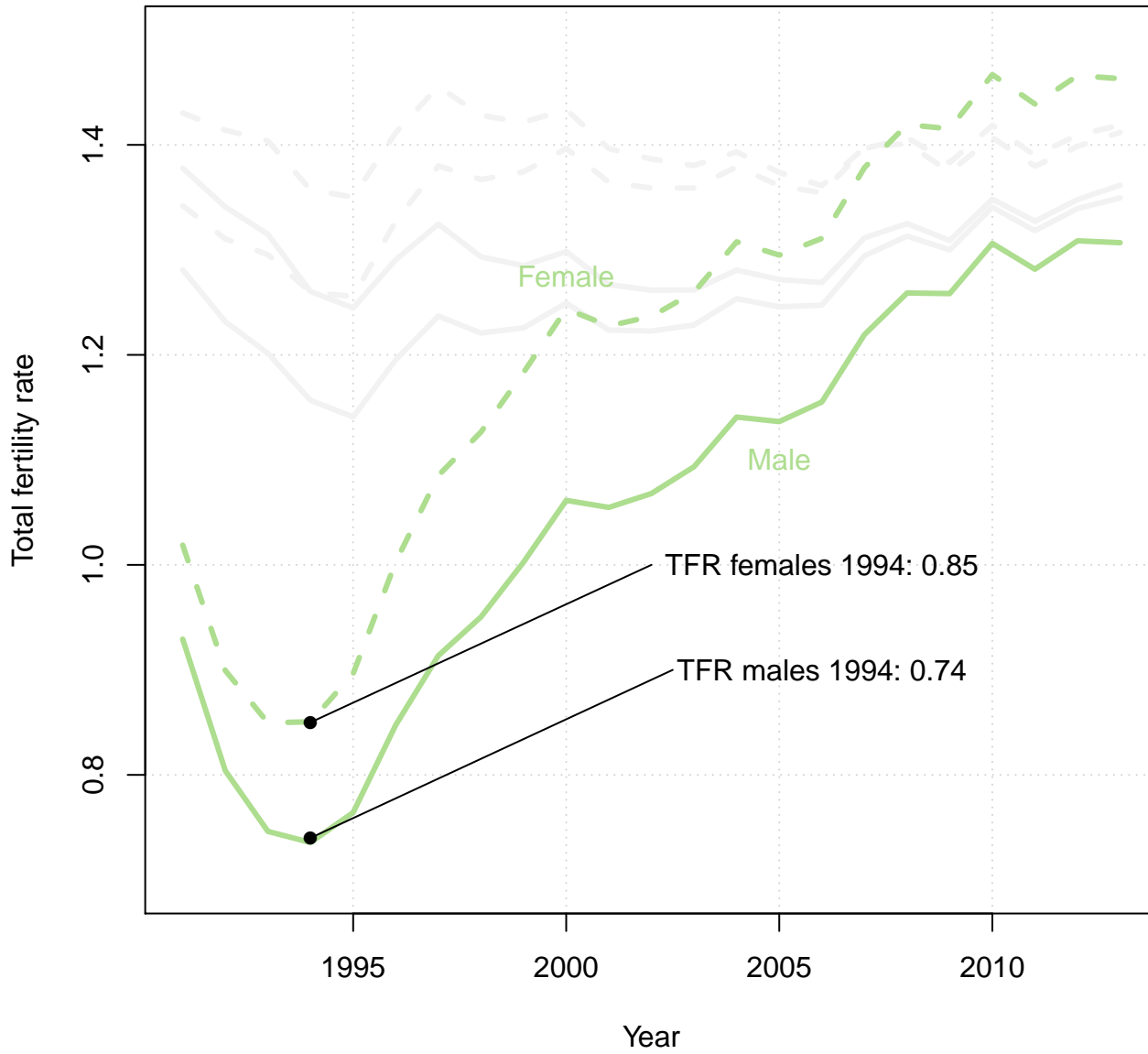
Male and female fertility in Germany 1991–2013



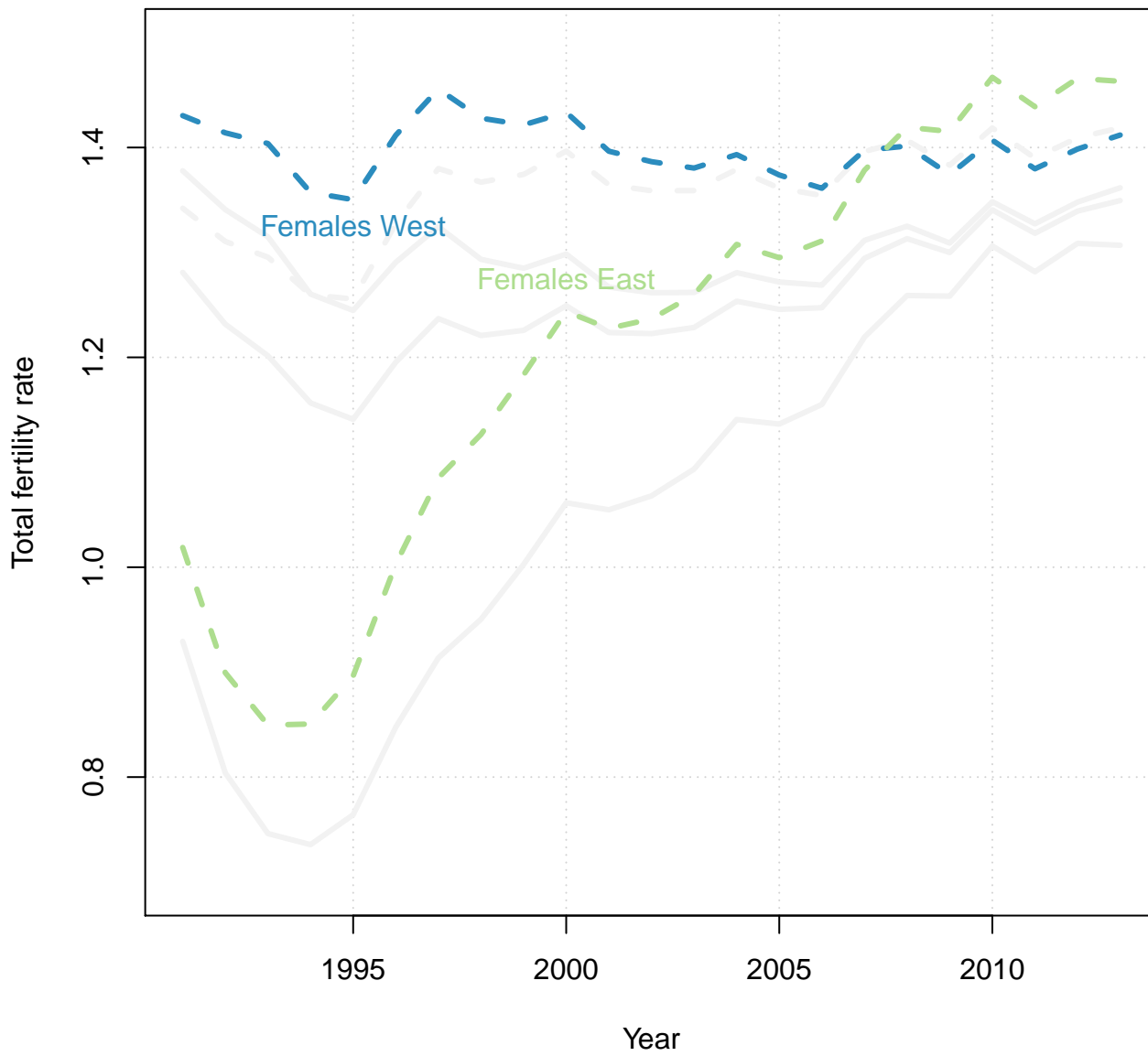
A new lowest low?



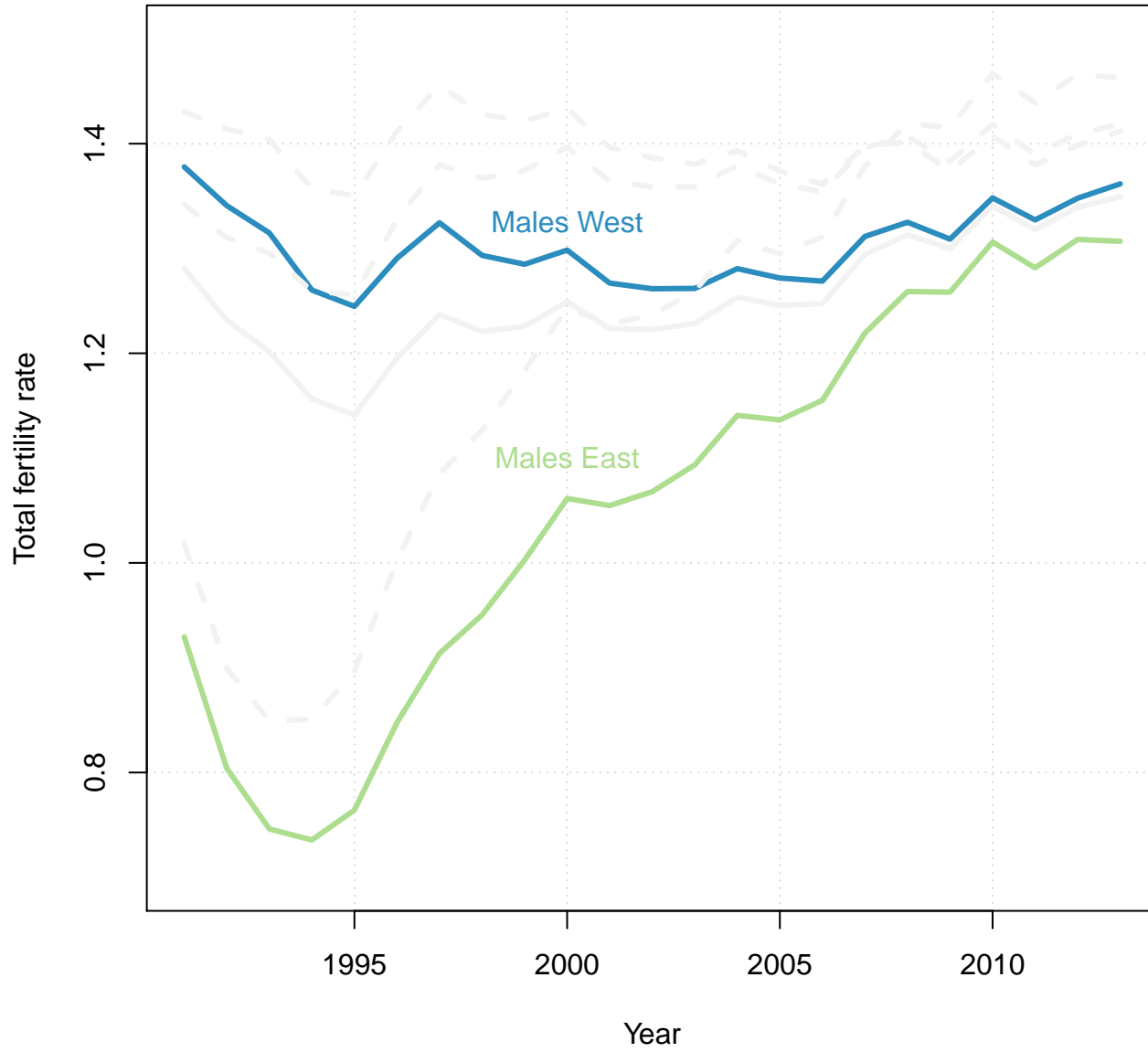
A new lowest low?



Has eastern Germany overtaken western Germany?



It depends...





Thank you for your attention!

Questions? Comments? Suggestions?



Age of father: Solution (Example)

Age-specific fertility rate for men aged 30 in 2010: $f_{30,2010}^m = \frac{B_{30,2010}^m}{PY_{30,2010}^m}$

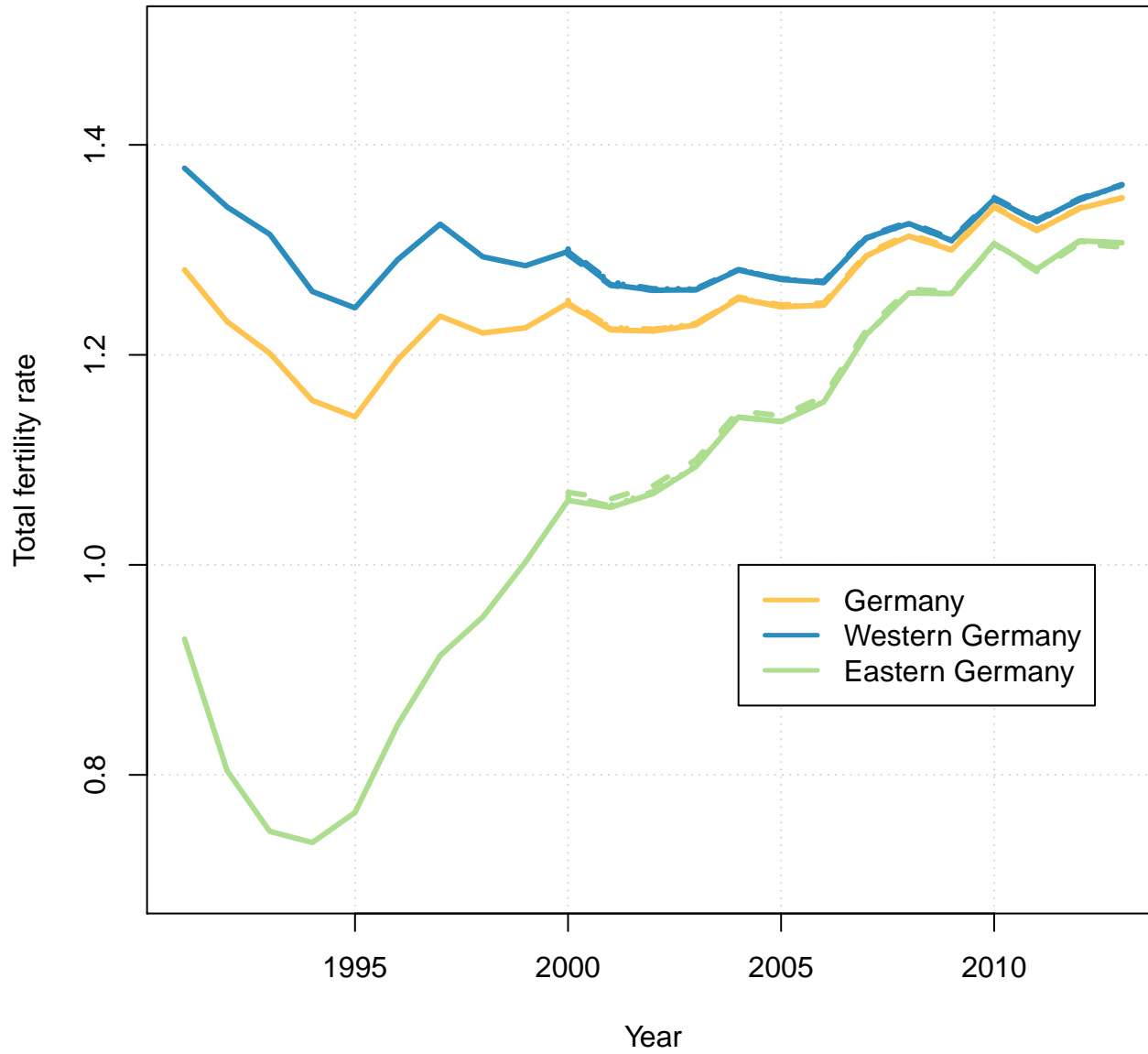
- Add all births for which age of father is known to be 30 to $B_{30,2010}^m$
- For age of mother $x = 16, \dots, 45$:
 - Get number of births for which age of father is unknown and mother is aged x , $b_{x,2010}^{NA}$
 - Calculate $\Pr(\text{Father} = 30 | \text{Mother} = x)$
 - Add $b_{x,2010}^{NA} \Pr(\text{Father} = 30 | \text{Mother} = x)$ to $B_{30,2010}^m$



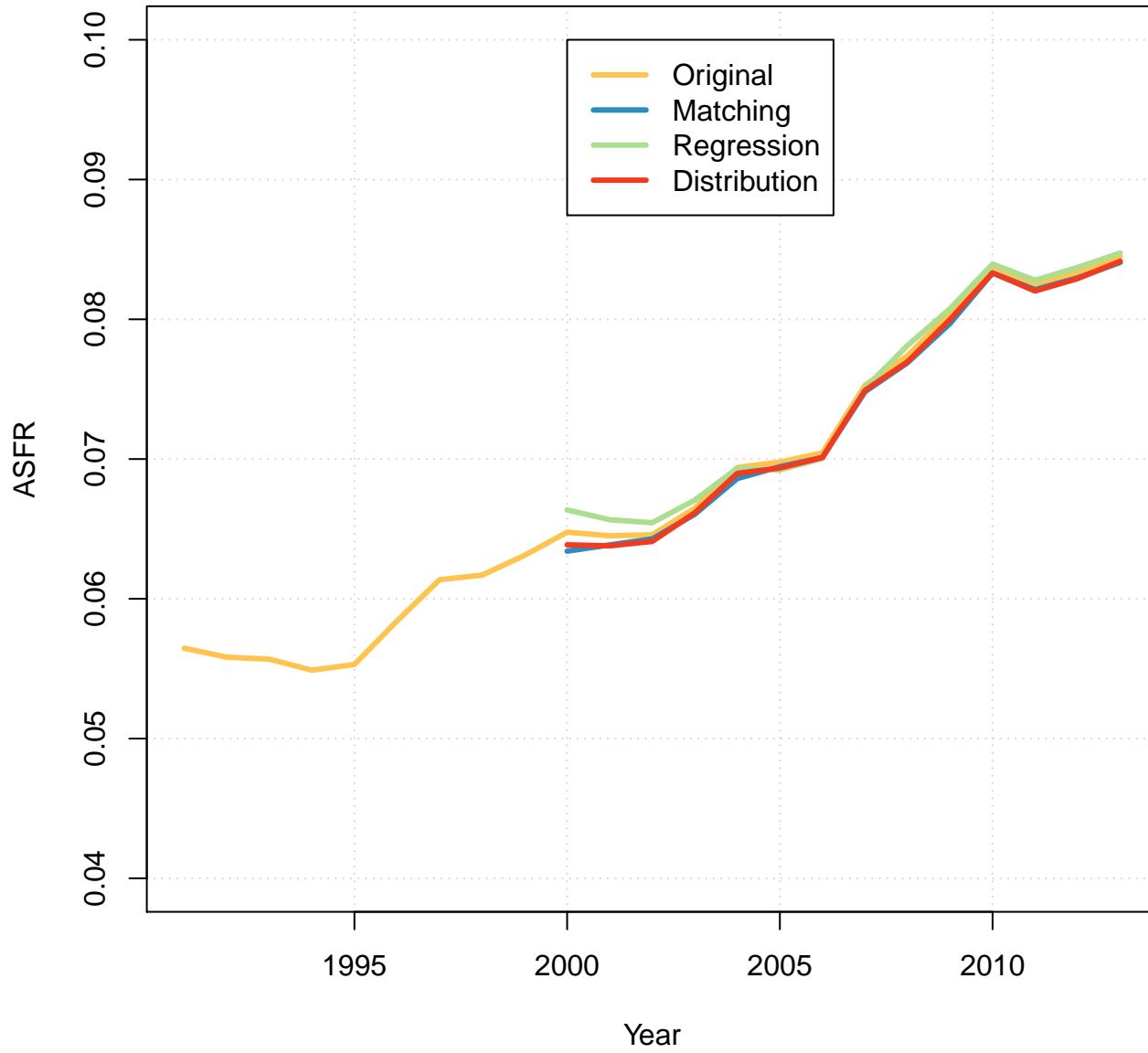
Imputations

- 3 approaches: Regression, matching, distribution-based
- Variables used: Age of mother, marital status, employment status of mother, federal state
- Can only be applied to 2000-2013
- Results do not differ much by approach
- Potential issues:
 - Variables used for imputations quite limited
 - Births with missing information have to be similar to births without missing information

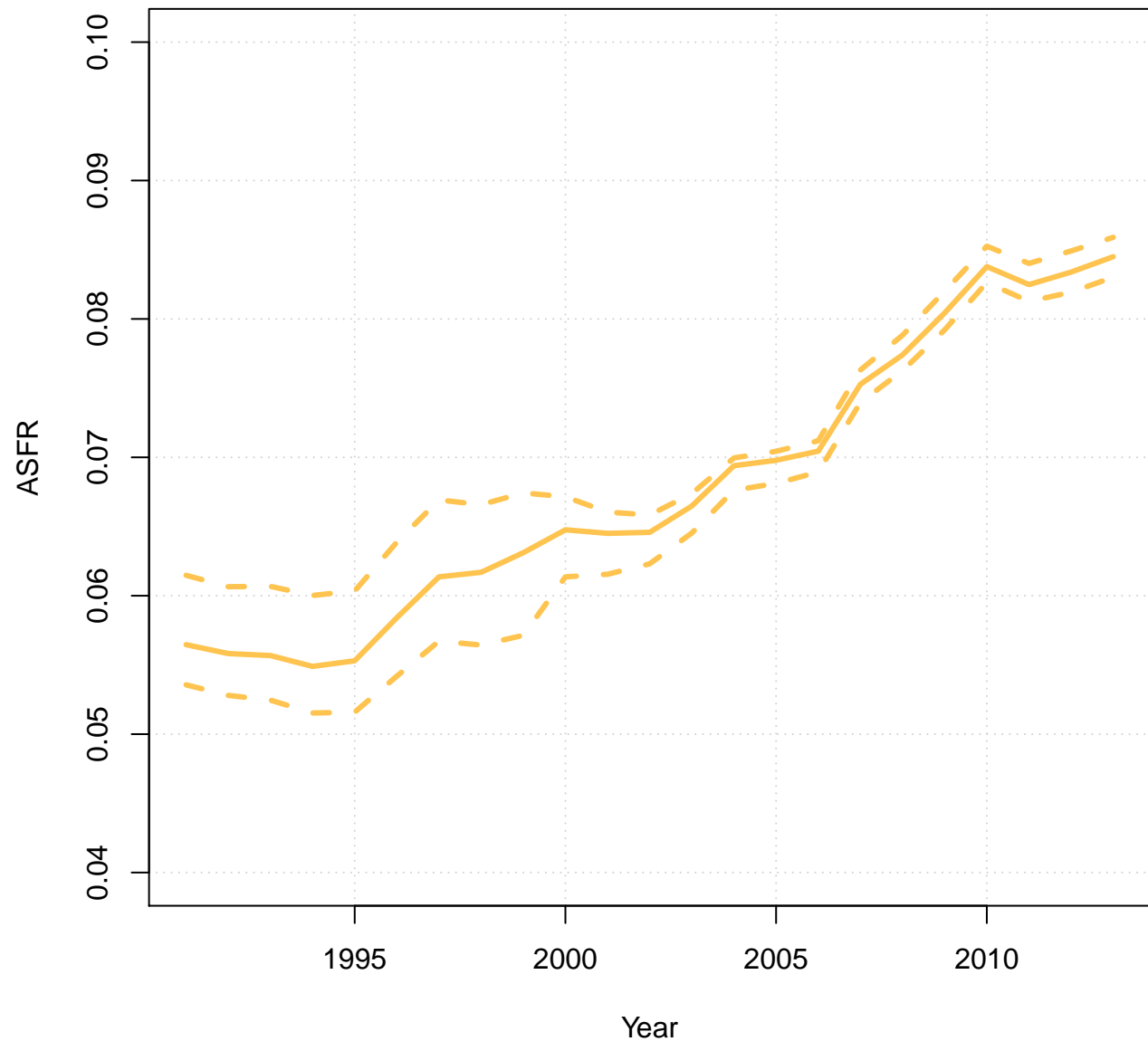
Imputations



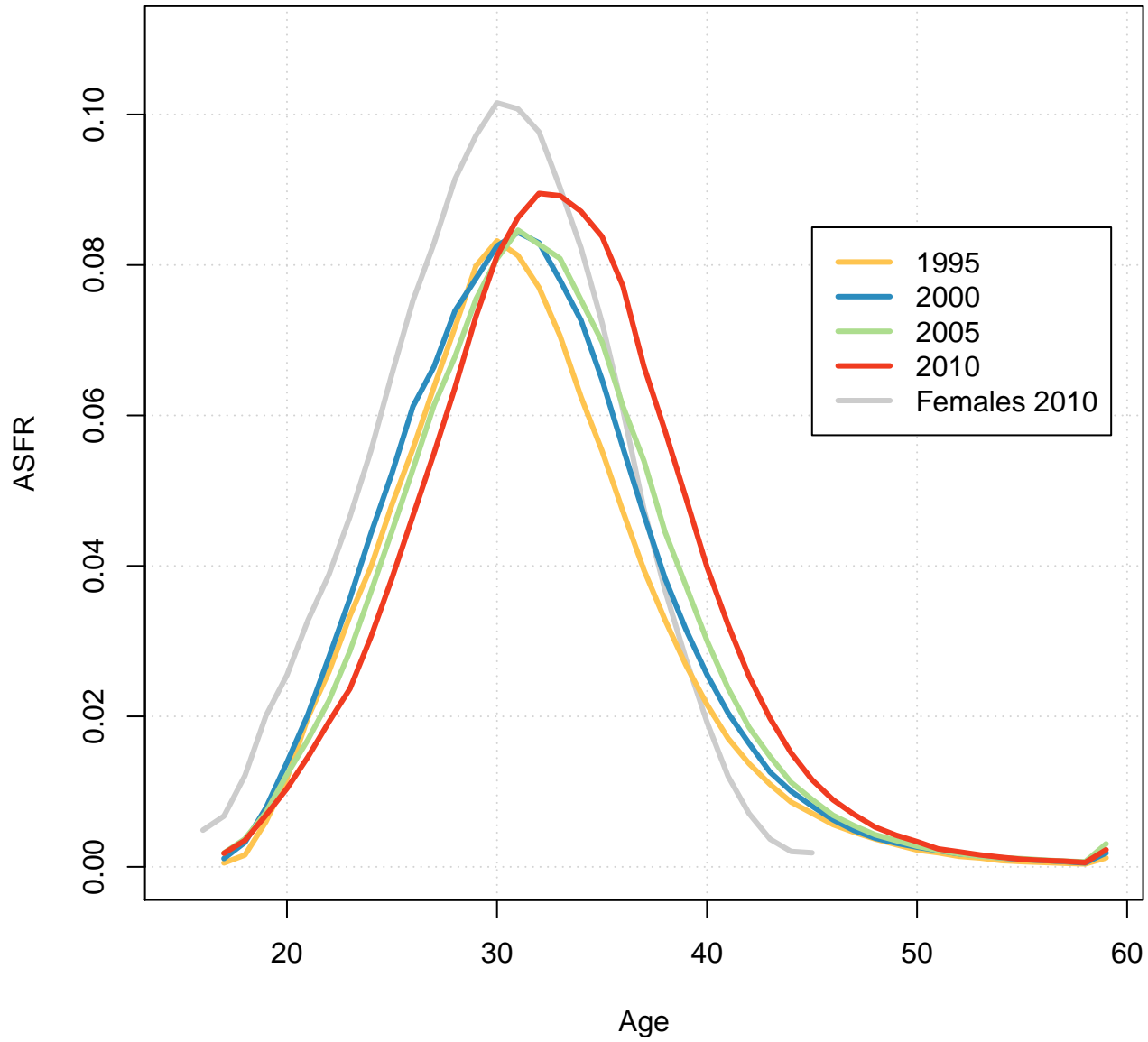
Imputations (ASFRs, males aged 35)



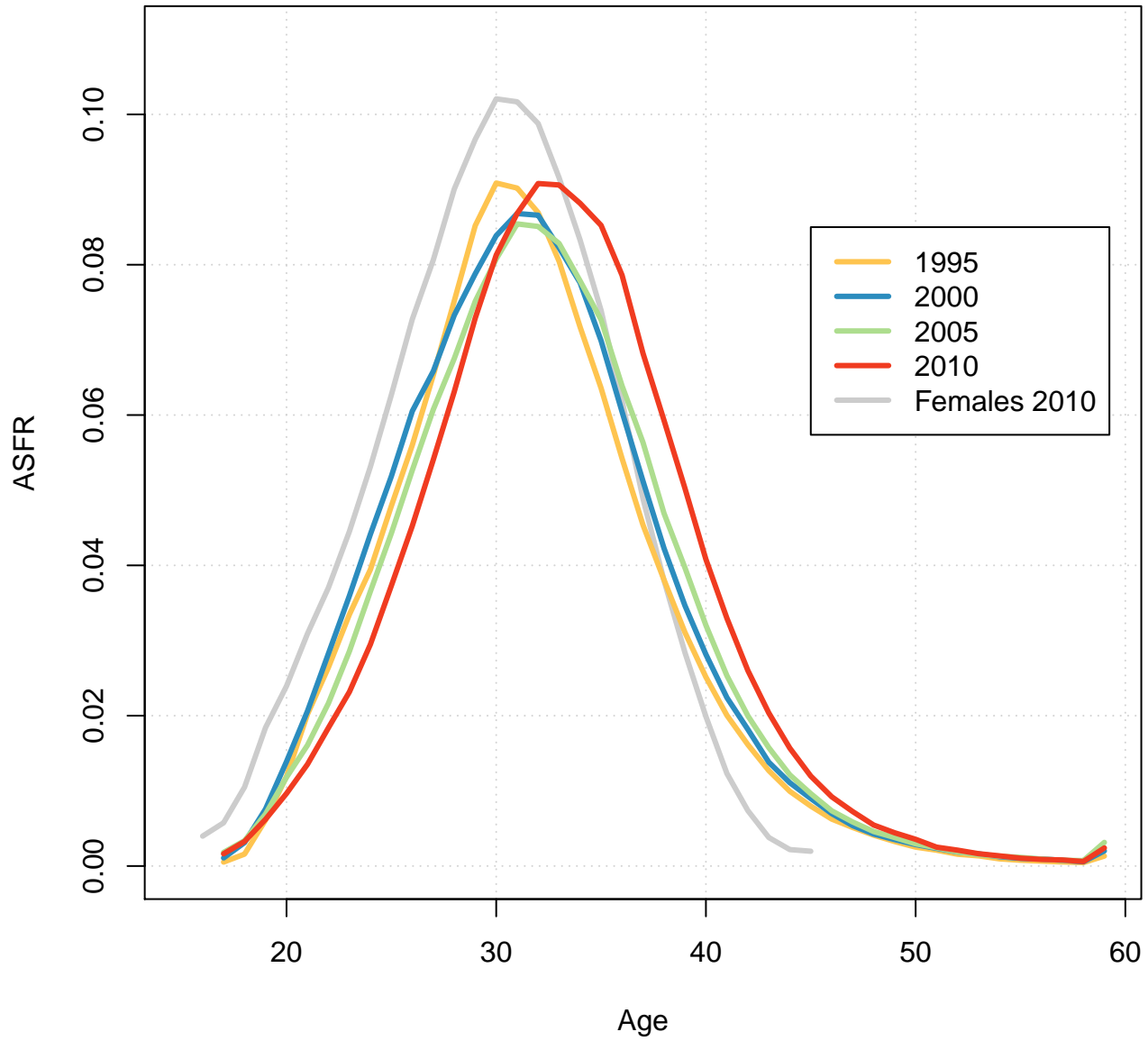
Sensitivity analysis (ASFRs, males aged 35)



Age schedules (Germany)



Age schedules (Western Germany)



Age schedules (Eastern Germany)

