

Senegal

```
## [1] "Census Females"
```

```
## # A tibble: 18 x 4
```

```
##   aggr.age `1988` `2002` `2013`
## *   <dbl>   <dbl>   <dbl>   <dbl>
## 1      0 657095 716100 926833.
## 2      5 573472 703724 884205.
## 3     10 459759. 655283. 781084.
## 4     15 379988. 582415. 677577.
## 5     20 318340 485829. 603110.
## 6     25 267352. 394499 529743.
## 7     30 219594. 323248. 439545.
## 8     35 173881. 263528 353976.
## 9     40 136773 212686. 288352.
## 10    45 109514 168203. 238373.
## 11    50 88982. 130956 197784.
## 12    55 72673 101096 157200.
## 13    60 49944 81280. 119593.
## 14    65 46281 64682. 87223.
## 15    70 70069 48960. 63212.
## 16    75      NA 32440. 43530.
## 17    80      NA 17741. 26791.
## 18    85      NA 19638. 27137.
```

```
## [1] "Census Males"
```

```
## # A tibble: 18 x 4
```

```
##   aggr.age `1988` `2002` `2013`
## *   <dbl>   <dbl>   <dbl>   <dbl>
## 1      0 662816 728605 969977.
## 2      5 554176 719472 950470.
## 3     10 439450. 657396. 839277.
## 4     15 349782. 559460 695107.
## 5     20 281996 455336. 578308.
## 6     25 231692 361872 488217.
## 7     30 190505. 286483. 406325.
## 8     35 154484. 231792. 328661.
## 9     40 125626 194048. 262459.
## 10    45 103543. 161778 214857.
## 11    50 87788. 129020 183726.
## 12    55 75121. 99418. 153017.
## 13    60 58463 79959. 118028.
## 14    65 51690 64899. 84264.
## 15    70 70302 49766. 59469.
## 16    75      NA 33960. 40615.
## 17    80      NA 18956. 24673.
## 18    85      NA 15910. 22853.
```

Thiele log-Normal Hump RW

```
##   user system elapsed
## 21.79   0.42   22.26
```

```
## [1] "relative convergence (4)"
```

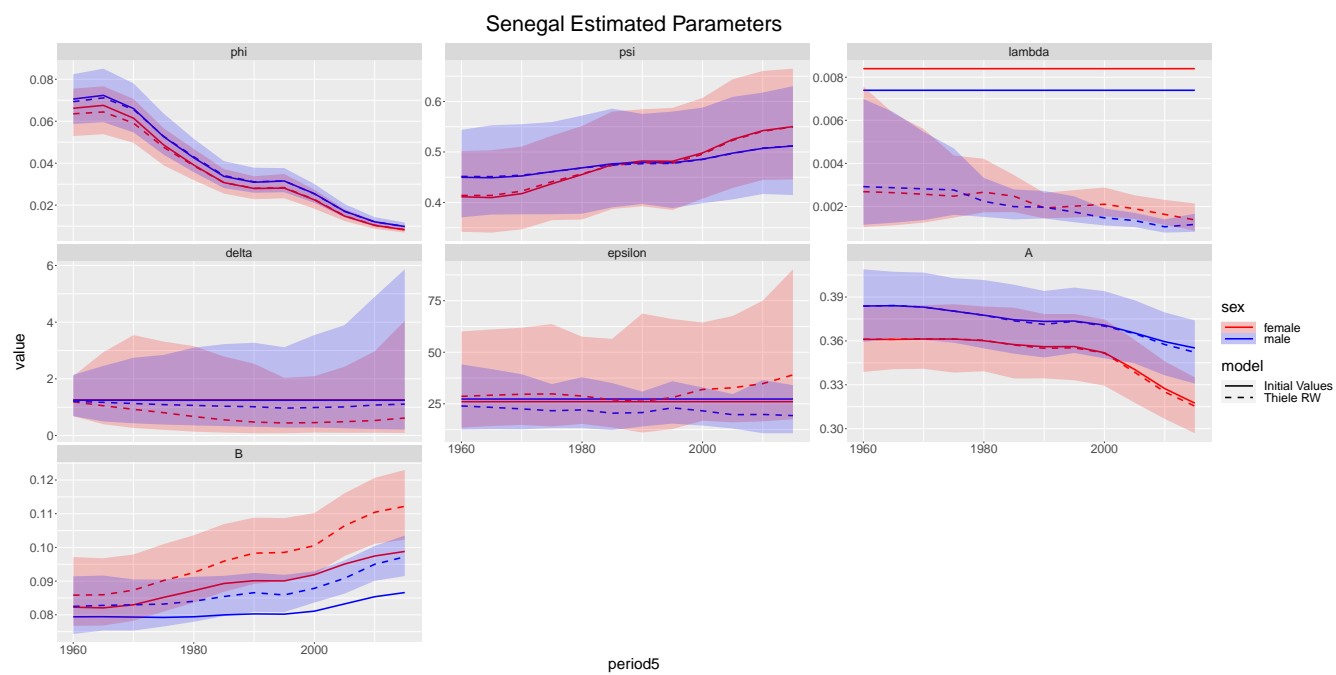


Figure 1: Estimated parameters

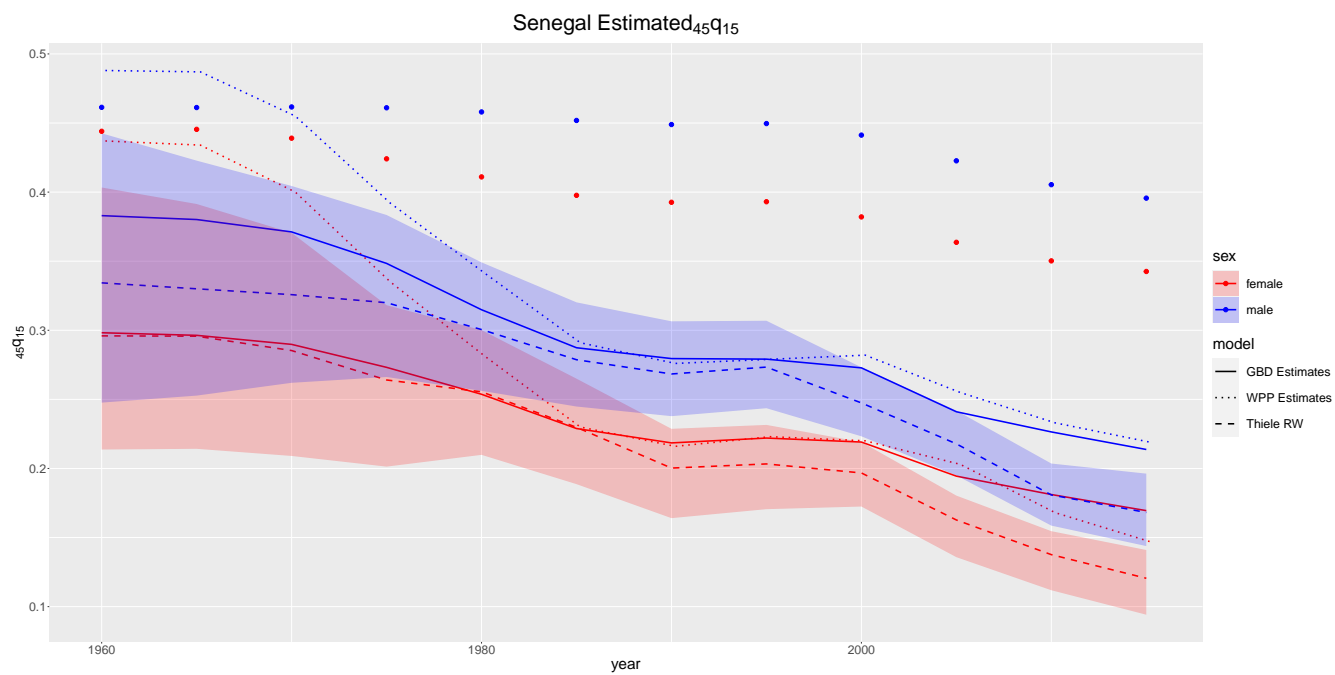


Figure 2: Estimated ${}_{45}q_{15}$

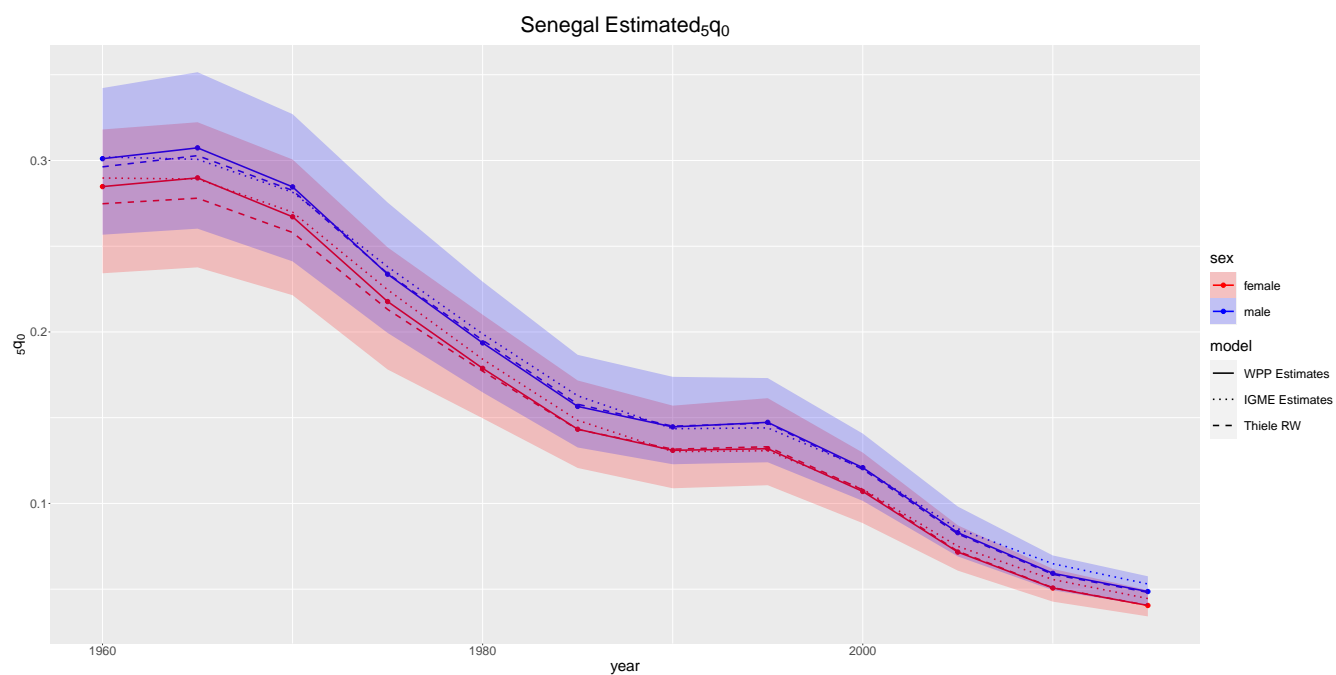


Figure 3: Estimated ${}_5q_0$

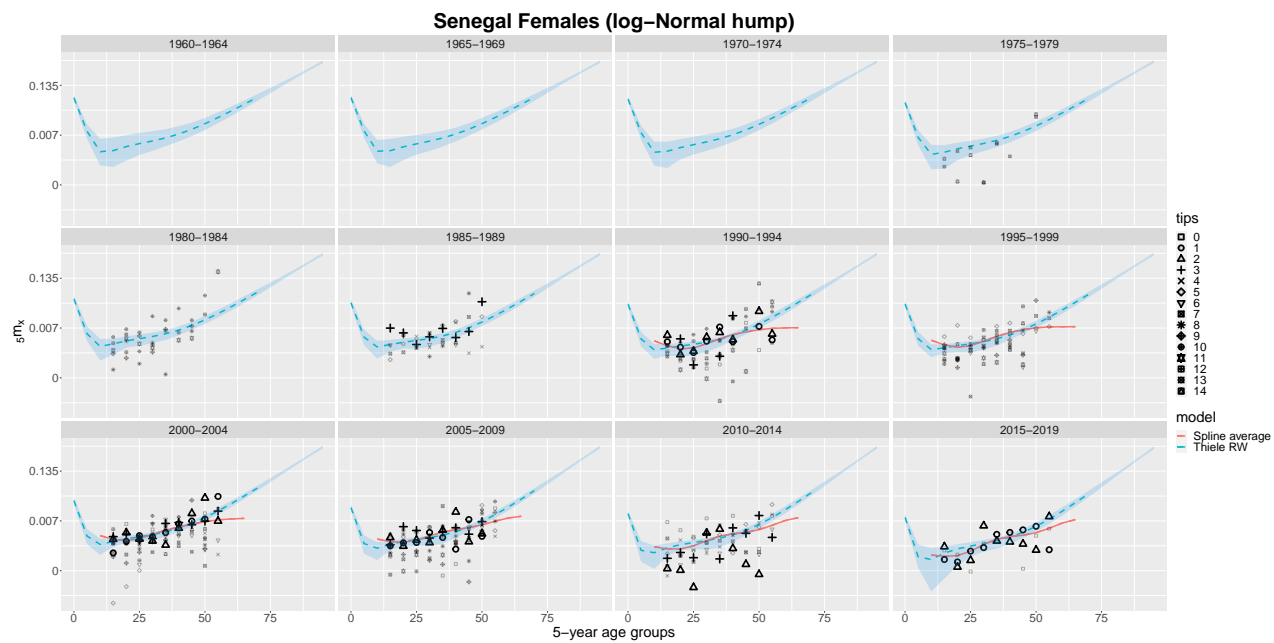


Figure 4: Mortality Schedules

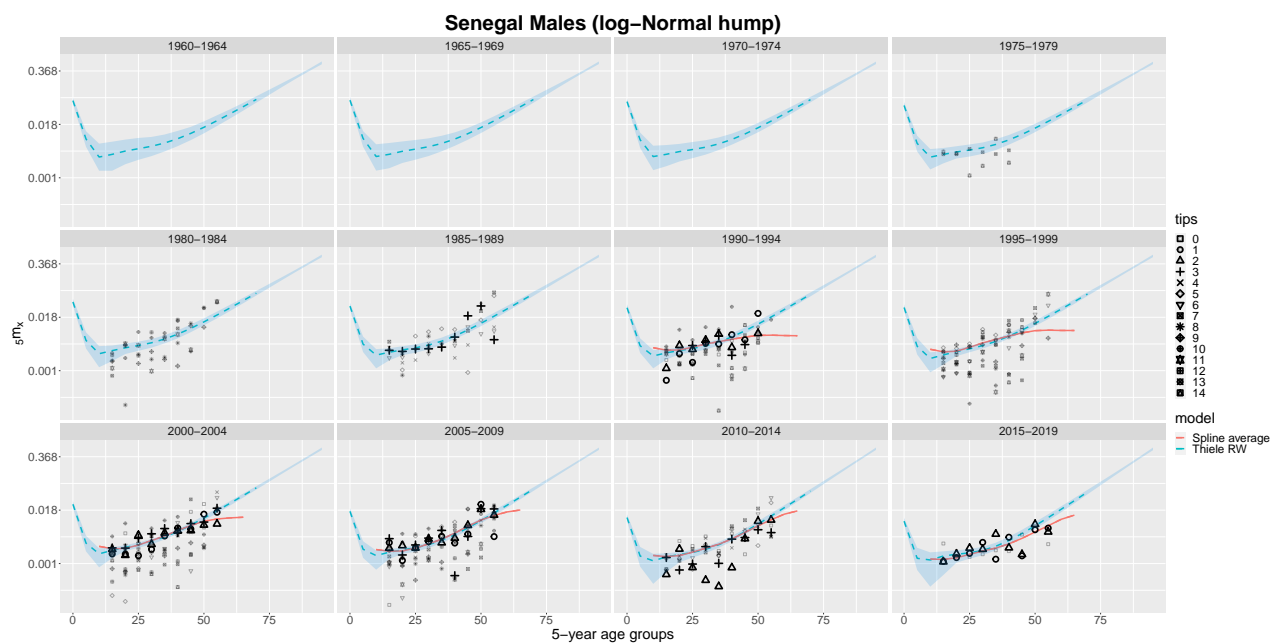


Figure 5: Mortality Schedules

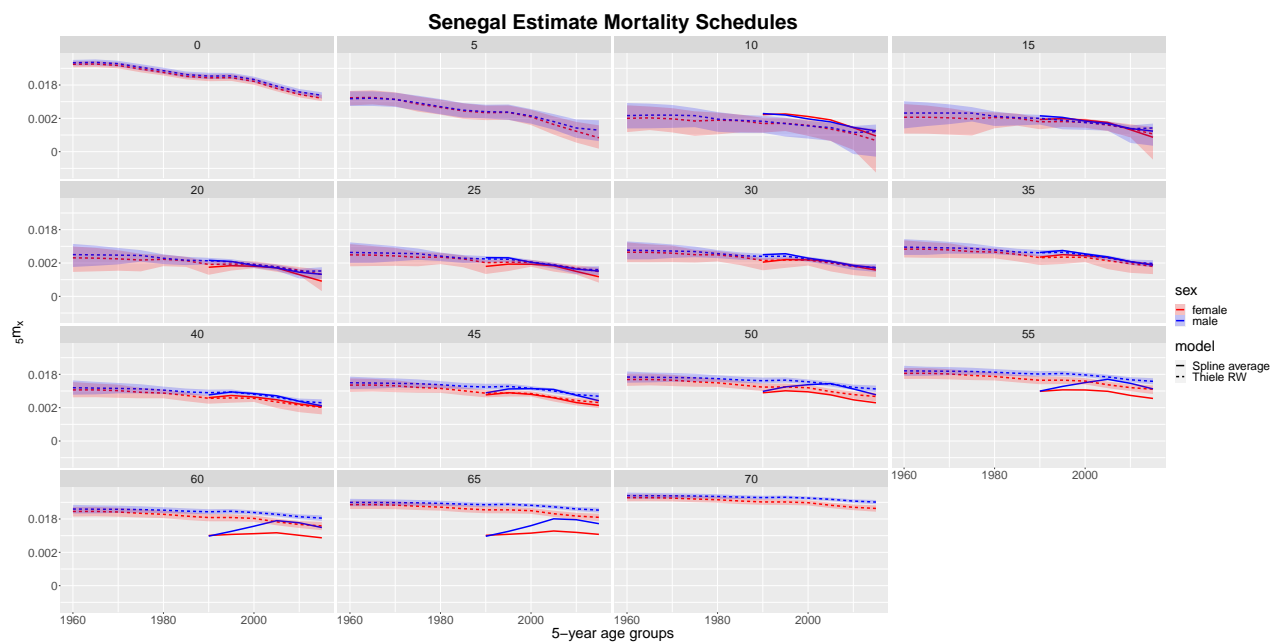


Figure 6: Mortality Schedules

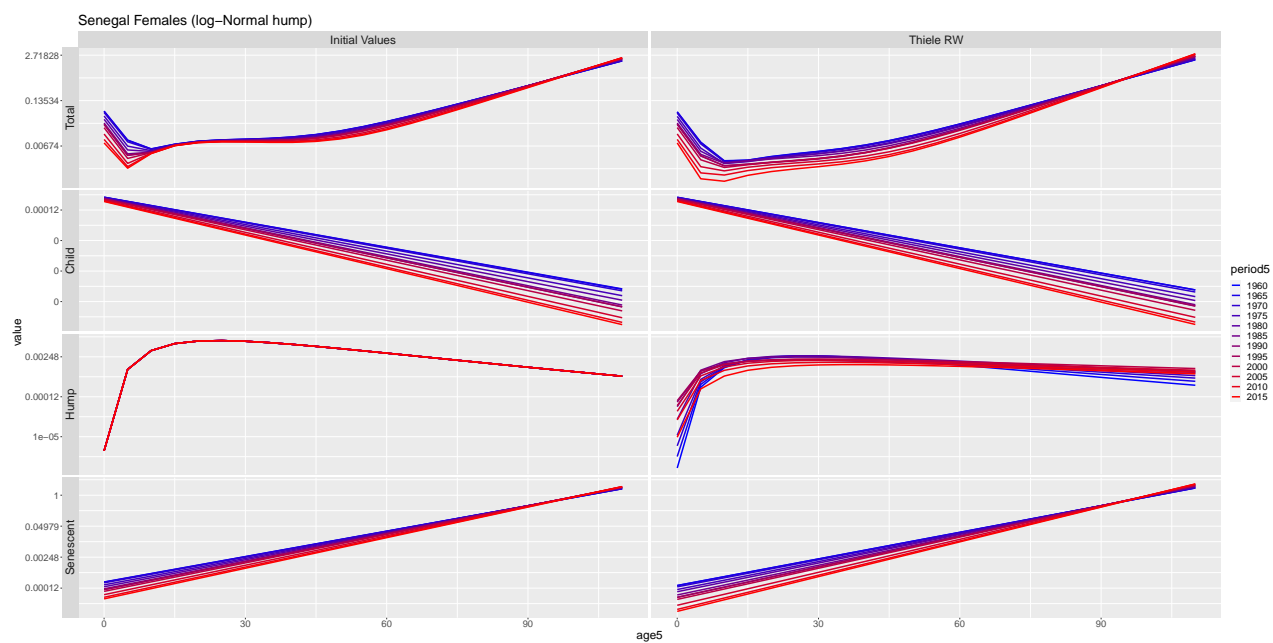


Figure 7: Thiele Decomposed

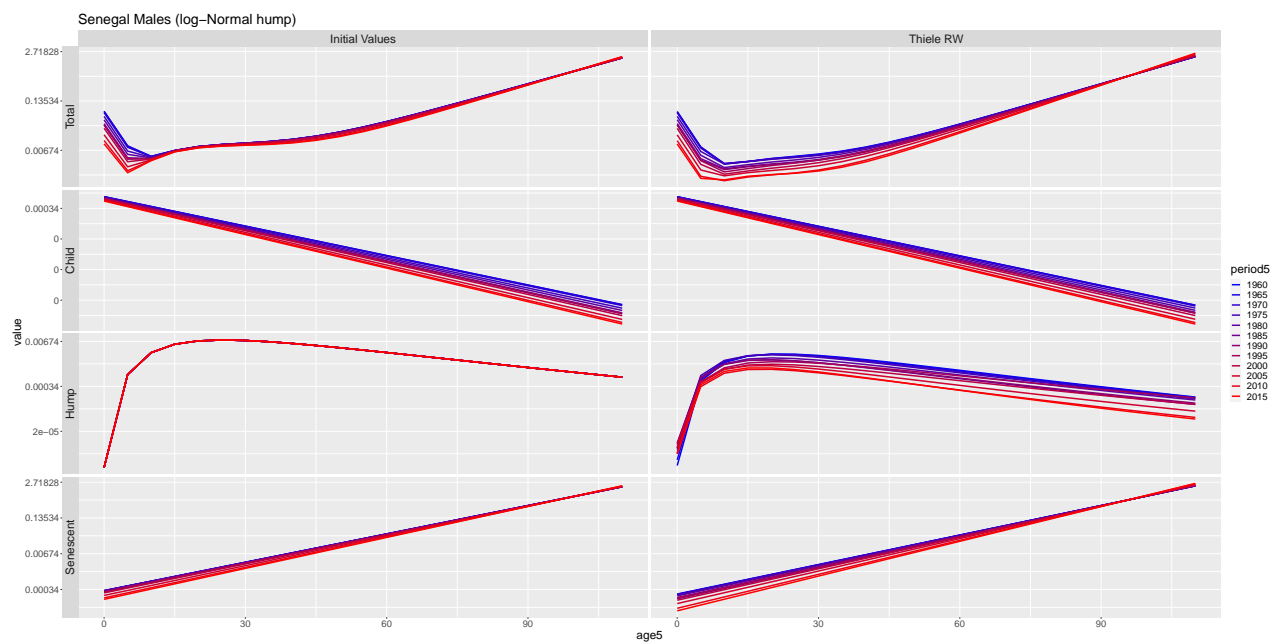


Figure 8: Thiele Decomposed

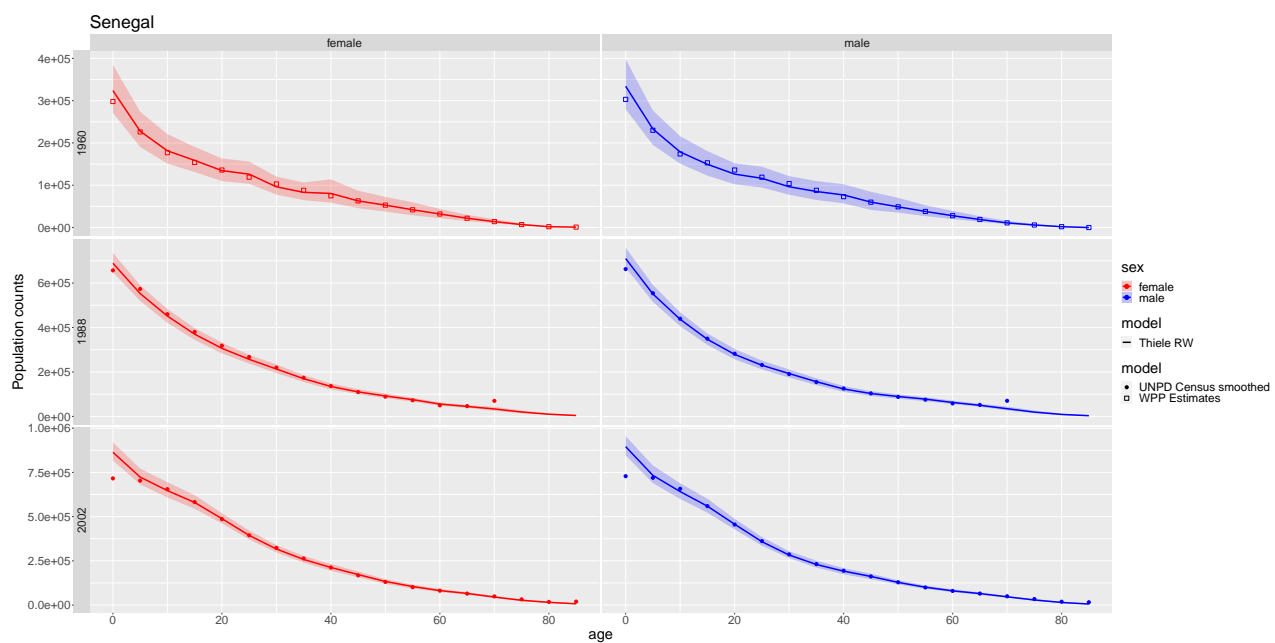


Figure 9: Population

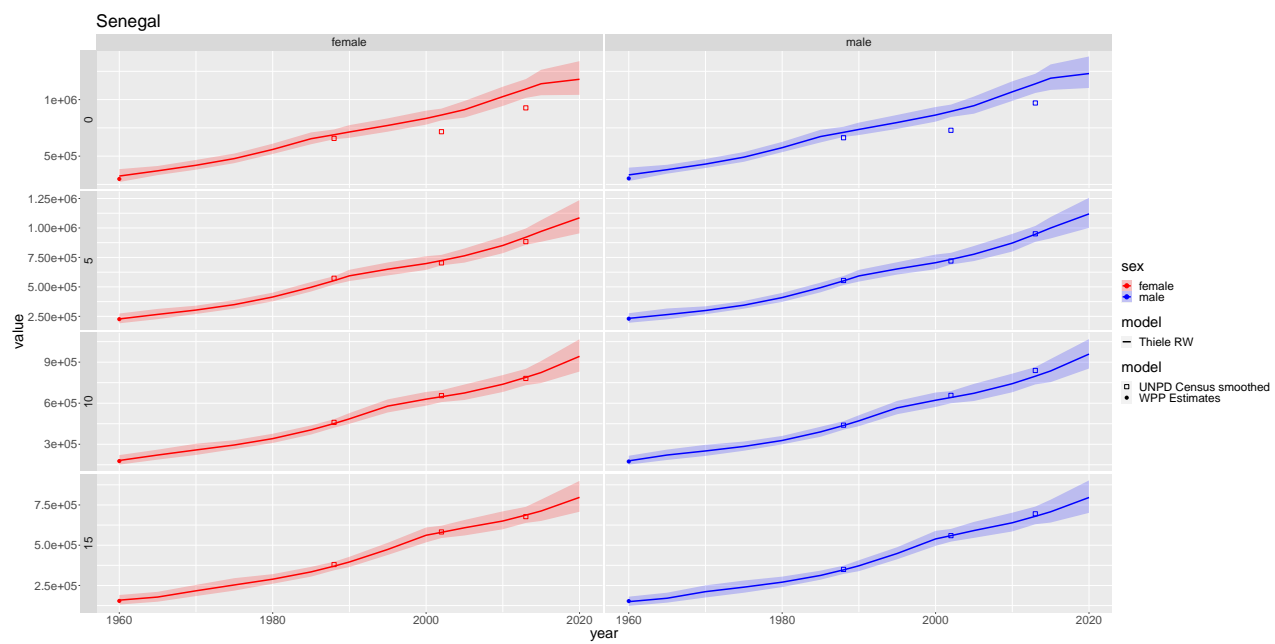


Figure 10: Population

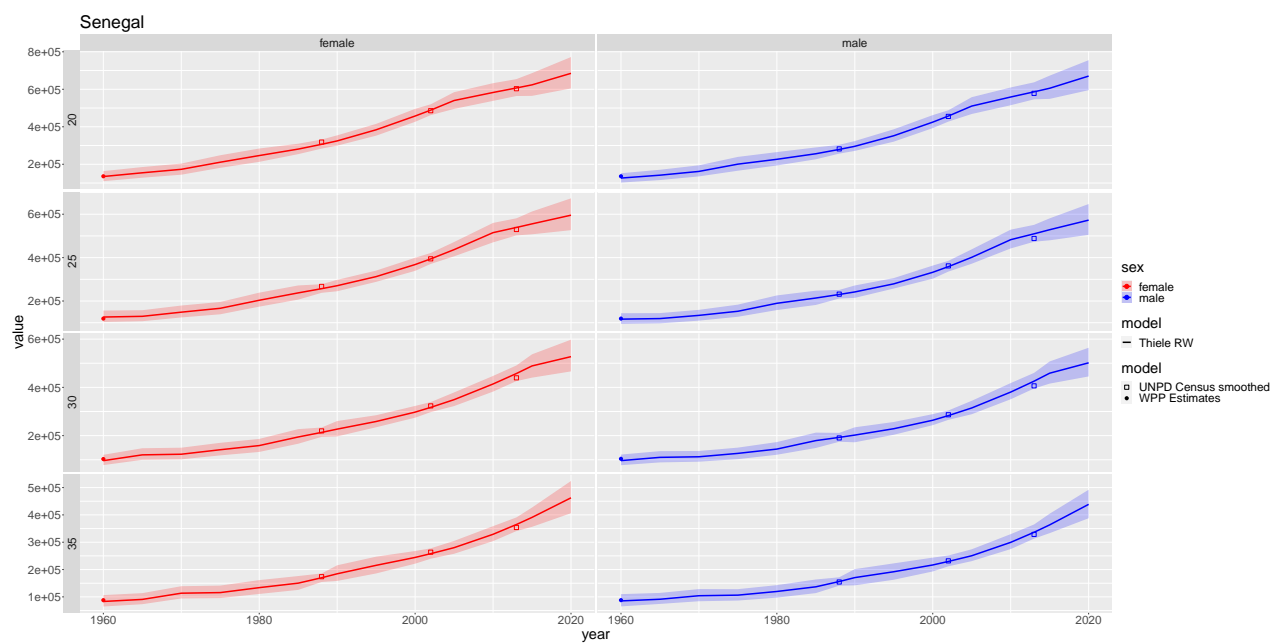


Figure 11: Population

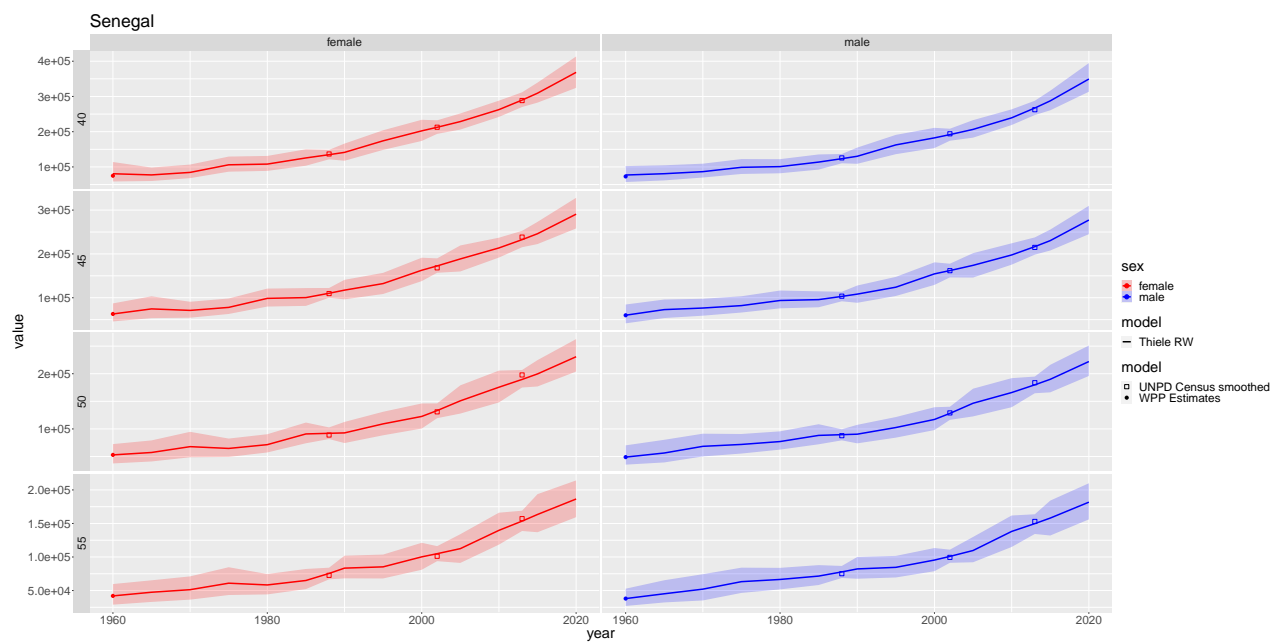


Figure 12: Population

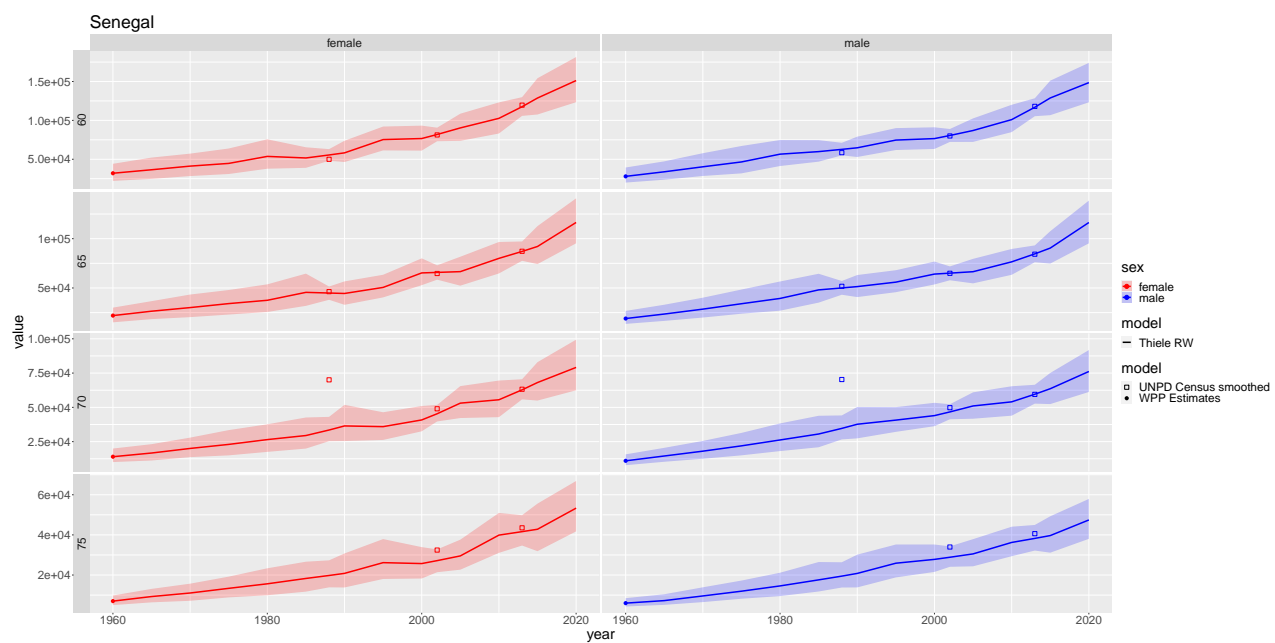


Figure 13: Population

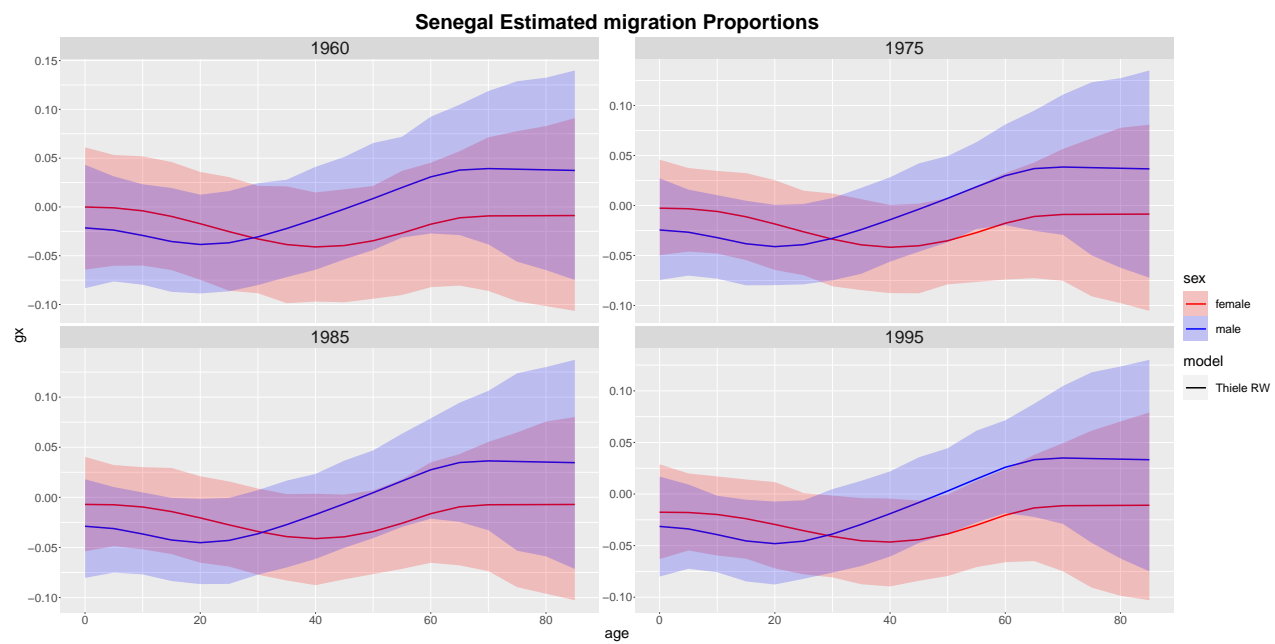


Figure 14: Migration

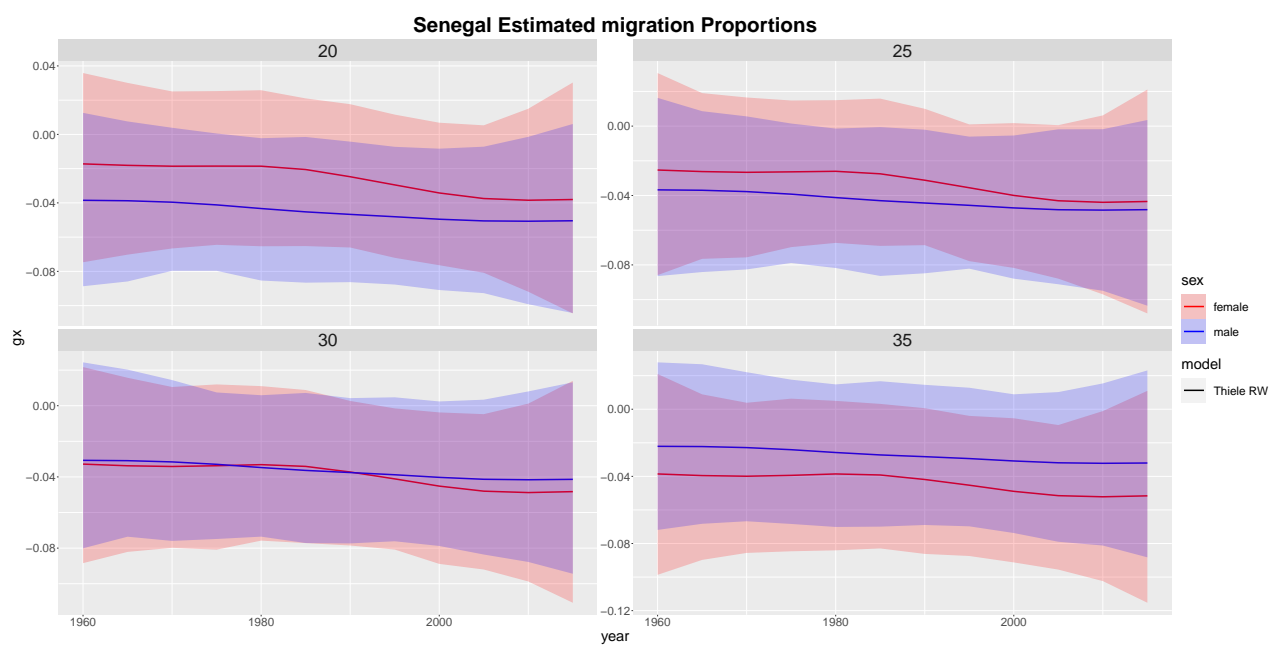


Figure 15: Migration

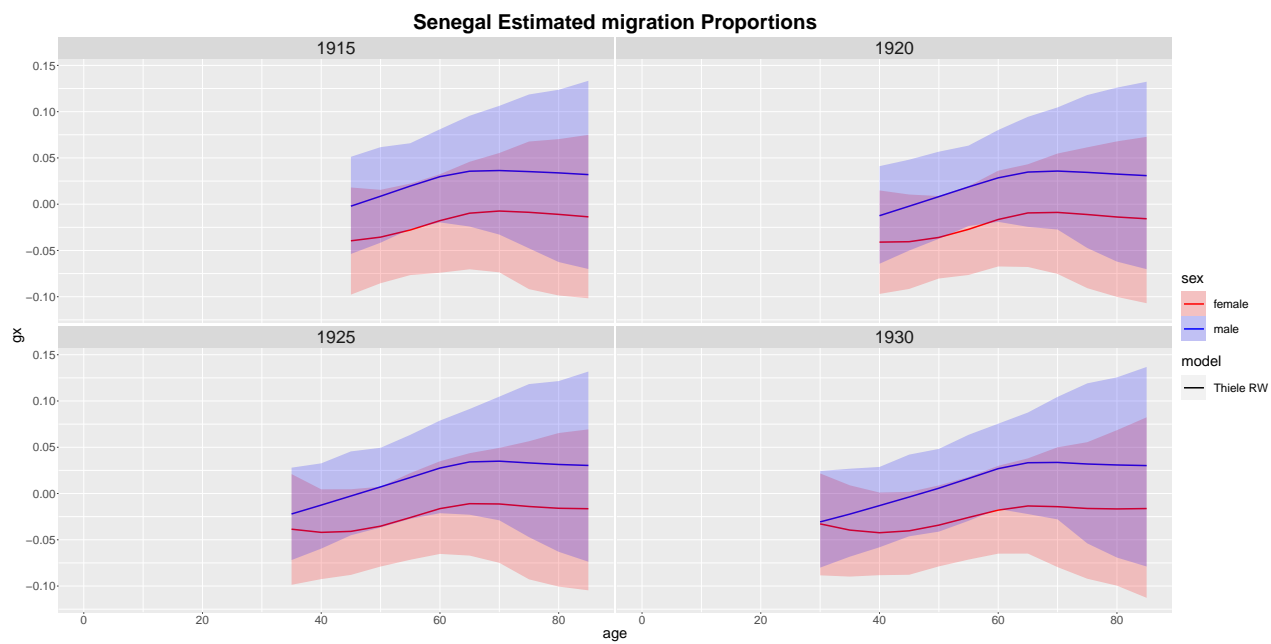


Figure 16: Migration

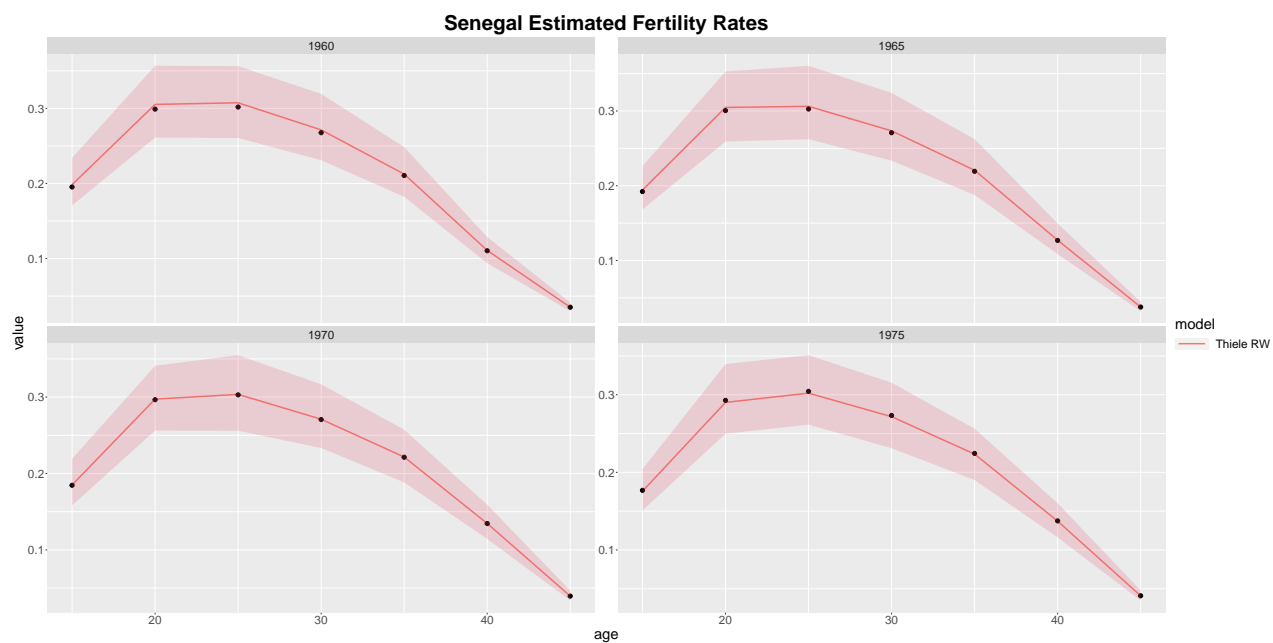


Figure 17: Fertility

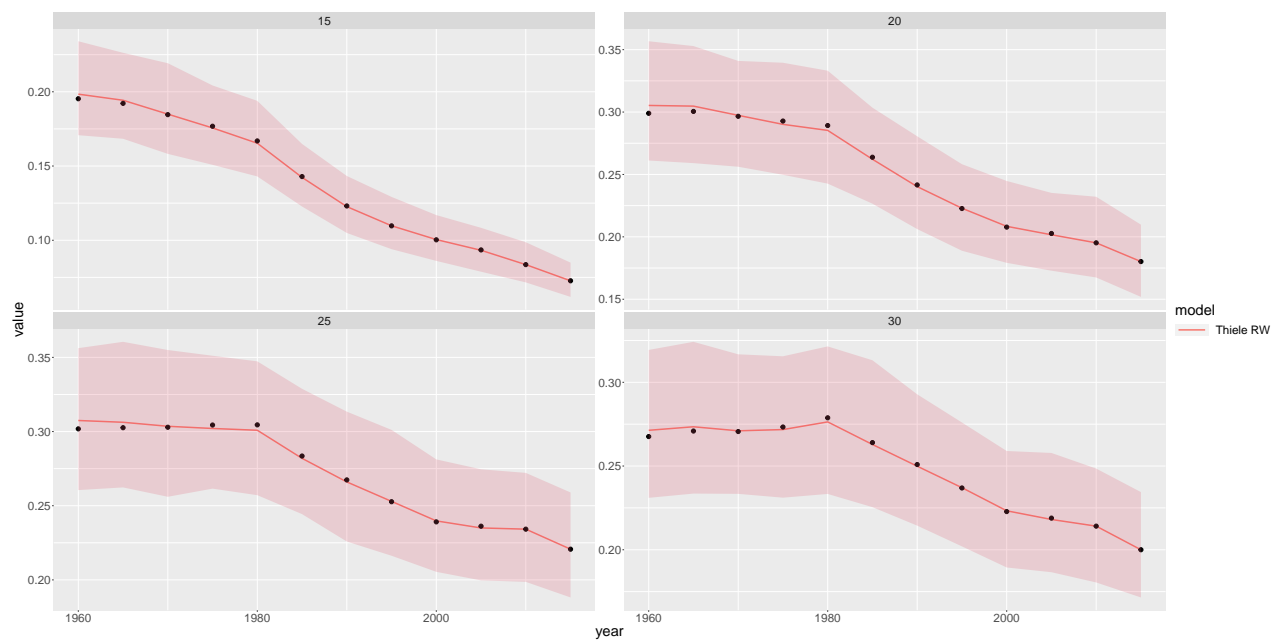


Figure 18: Fertility