

Lesotho

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

## # A tibble: 86 x 3
##   age `1966` `2006`
##   <dbl> <dbl> <dbl>
## 1     0 11404. 21444
## 2     1 12221. 20638.
## 3     2 12447. 20098
## 4     3 12723. 19879.
## 5     4 12778. 20123.
## 6     5 12750. 20443.
## 7     6 12695. 20836.
## 8     7 12634. 21032.
## 9     8 12376. 21056.
## 10    9 12098. 21170
## # ... with 76 more rows

## [1] "Census Females 5-year"

## # A tibble: 18 x 5
##   age `1976` `1986` `1996` `2016`
##   <dbl> <dbl> <dbl> <dbl> <dbl>
## 1     0 86137. 111810. 102516. 99362
## 2     5 80165. 109553. 117963. 107586.
## 3    10 75752. 100753. 123895. 107761.
## 4    15 67350. 87571. 114216. 103920.
## 5    20 55461. 74997. 92603. 99418.
## 6    25 44109. 62020. 71754. 91978.
## 7    30 35611. 49448. 59416. 79414.
## 8    35 31921. 39635. 50726. 63272.
## 9    40 29893. 32901. 41871. 48964.
## 10   45 25268. 29931. 34156. 40782
## 11   50 21805. 27462. 28055. 37417
## 12   55 20177. 22000. 24845. 33785.
## 13   60 16357. 18039. 22459. 28252.
## 14   65 12186. 16038. 17256. 22834
## 15   70 10347. 12161. 12968. 18834
## 16   75 8706. 8324. 10184. 15850.
## 17   80 4372. 5725. 5257. 11826.
## 18   85 4445. 7621. 6397. 10006.

## [1] "Census Males"

## # A tibble: 86 x 3
##   age `1966` `2006`
##   <dbl> <dbl> <dbl>
## 1     0 11127. 21916
## 2     1 12005. 20846
## 3     2 12219. 20228.
## 4     3 12562. 19983.
## 5     4 12689. 20290.
## 6     5 12720. 20698.
```

```
## 7      6 12726. 21134.
## 8      7 12782. 21314.
## 9      8 12600. 21319.
## 10     9 12368. 21394.
## # ... with 76 more rows

## [1] "Census Males 5-year"

## # A tibble: 18 x 5
##   age `1976` `1986` `1996` `2016`
##   <dbl> <dbl> <dbl> <dbl> <dbl>
## 1     0 85931. 113851. 104230. 100793
## 2     5 80153. 110687. 120469. 107144.
## 3    10 73397.  99977. 125098. 107981.
## 4    15 61668.  82770. 111192. 104784.
## 5    20 50032.  67354.  86836.  99918.
## 6    25 41339.  55999.  66645.  94347.
## 7    30 34579.  47098.  55028.  84490
## 8    35 31374.  39678.  47007.  68028.
## 9    40 29008.  33697.  40089.  50500.
## 10   45 24309.  30380.  33831.  38325
## 11   50 20635.  26824.  27505.  31438.
## 12   55 18142.  20728.  22931.  26018.
## 13   60 13537.  16158.  18947.  20652.
## 14   65  9024.  13203.  13353.  15852.
## 15   70  6620.   8928.   9035.  11953
## 16   75  4774.   5150.   6303.   8594.
## 17   80  1927.   2695.   2627.   5297
## 18   85  1854.   3103.   2588.   3425
```

Thiele log-Normal Hump Spline

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

##   log_tau2_logpop      log_tau2_logpop      log_tau2_logpop      log_tau2_logpop      log
##   4.34112483          5.58440915          4.40826300          5.72267805
##   log_dispersion      log_dispersion      log_lambda_tp          tp_slope
##   1.89794157          1.56223141          3.90873556          0.01489862
##   log_lambda_phi      log_lambda_psi      log_lambda_A          log_lambda_B          log_la
##   11.30357204         11.28534587         11.09482225         11.41029508
##   log_lambda_epsilon
##   4.55010186
```

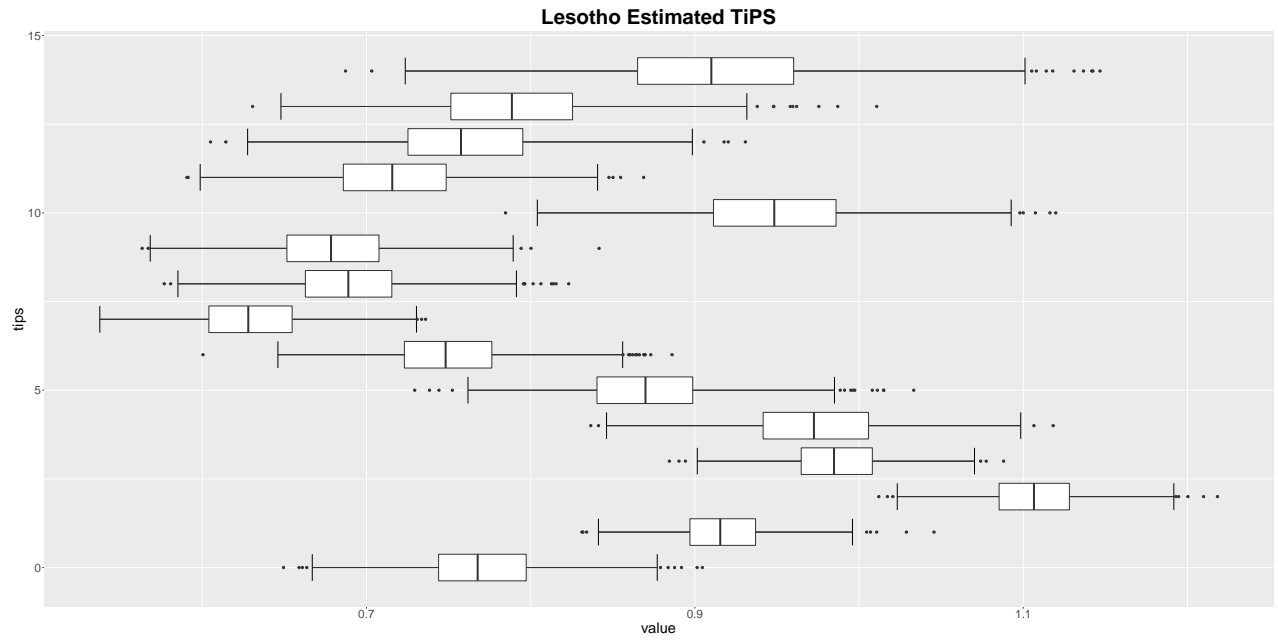


Figure 1: Estimated TiPS

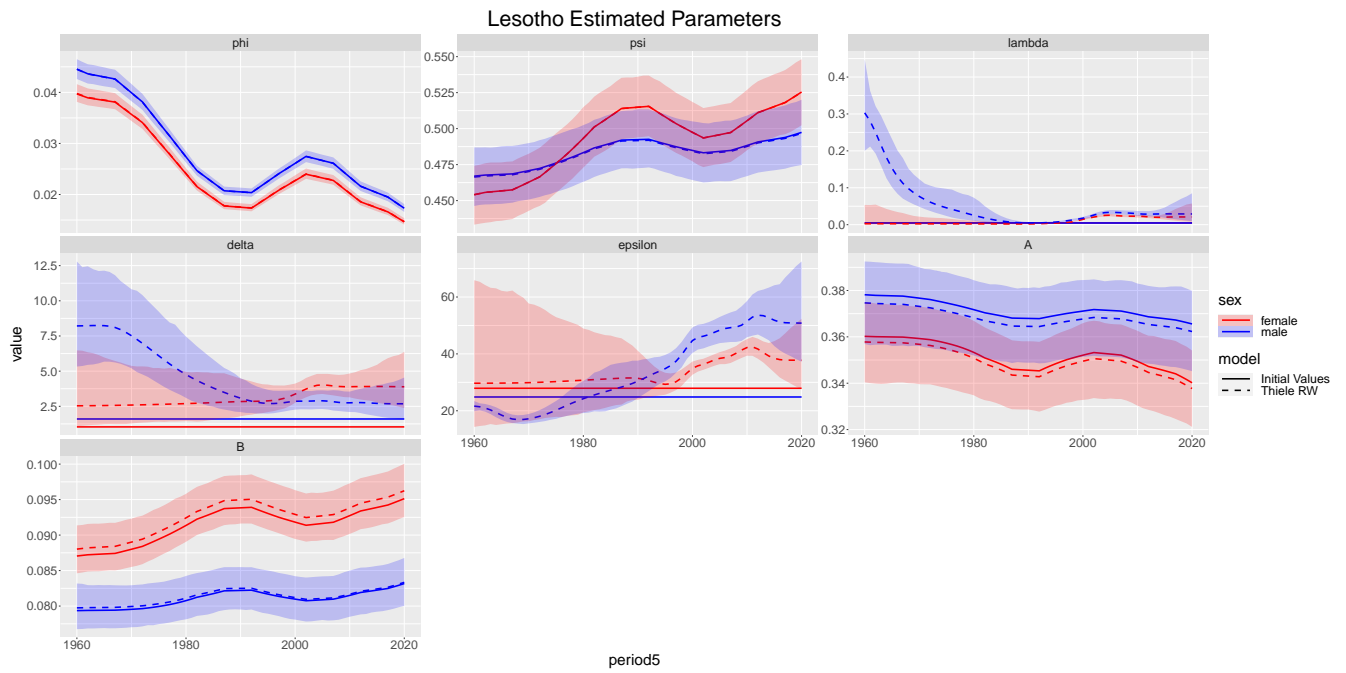


Figure 2: Estimated parameters

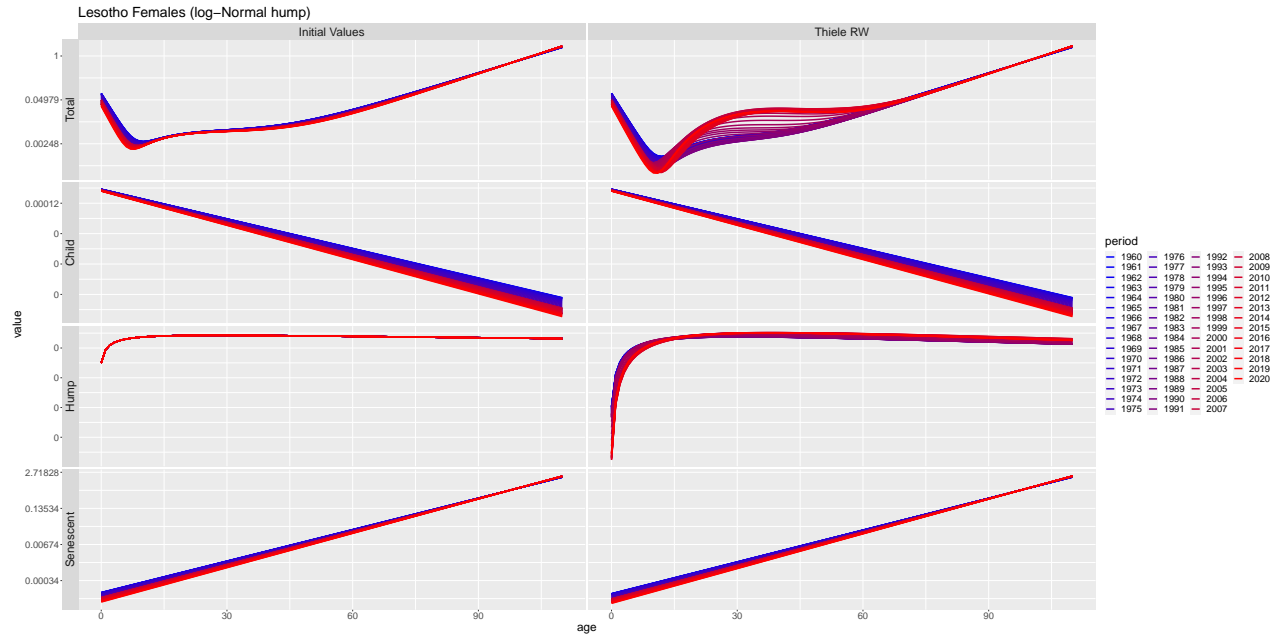


Figure 3: Thiele Decomposed

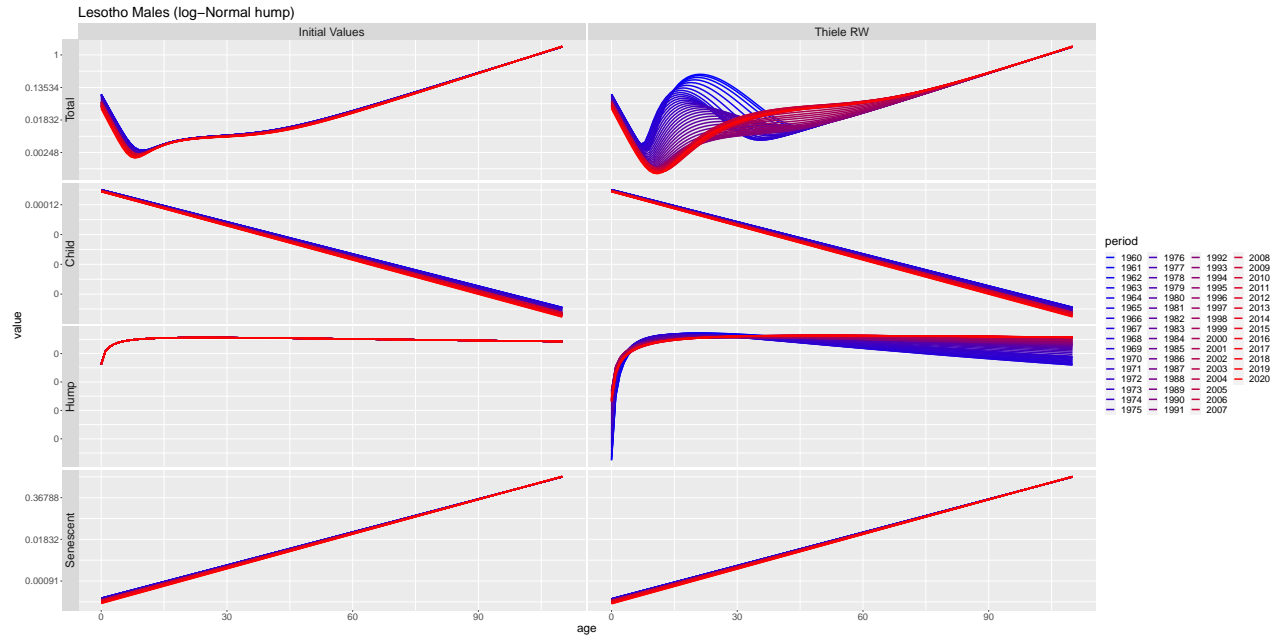


Figure 4: Thiele Decomposed

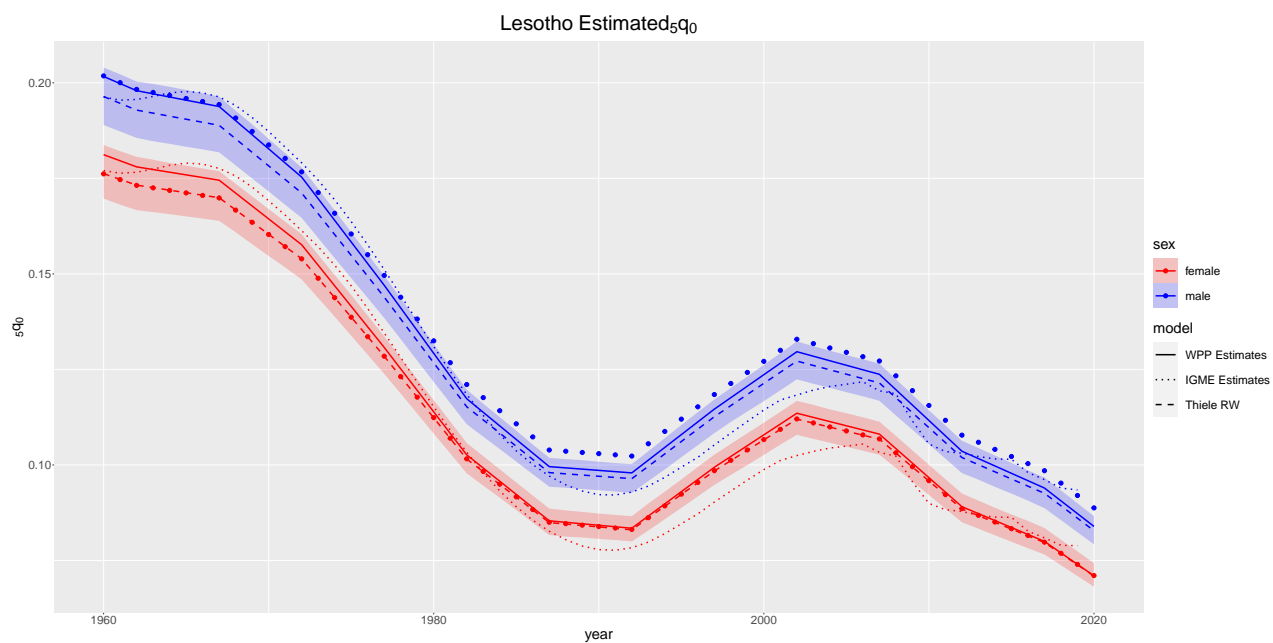


Figure 5: Estimated ${}_5q_0$

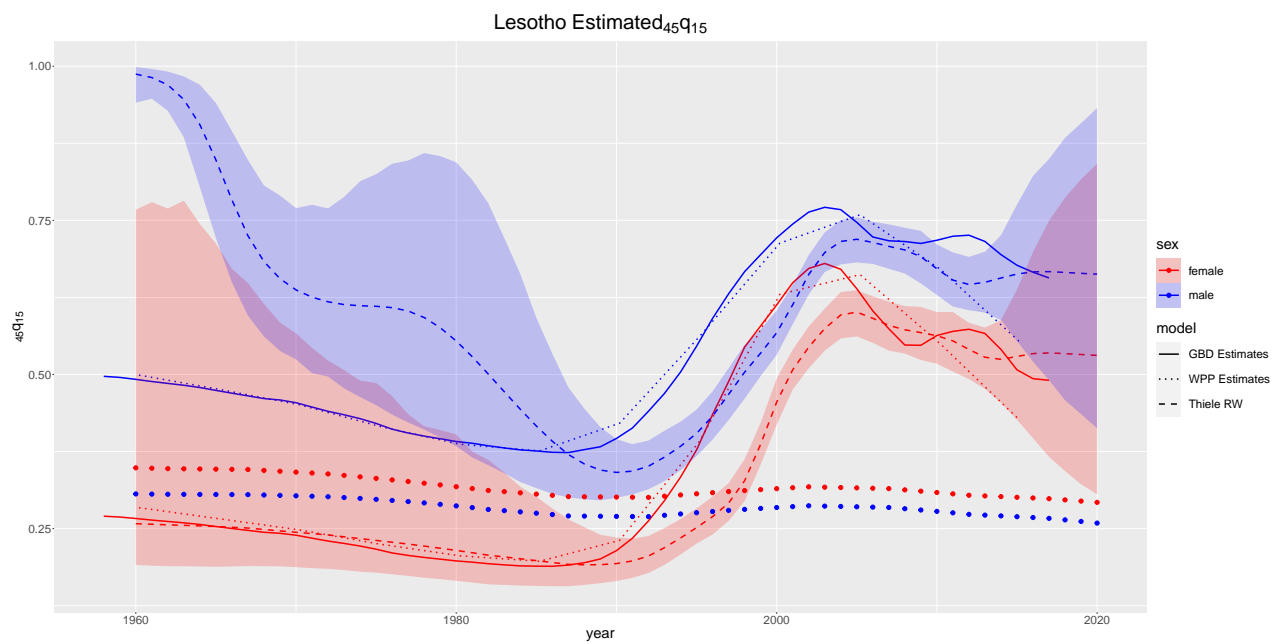


Figure 6: Estimated ${}_{45}q_{15}$

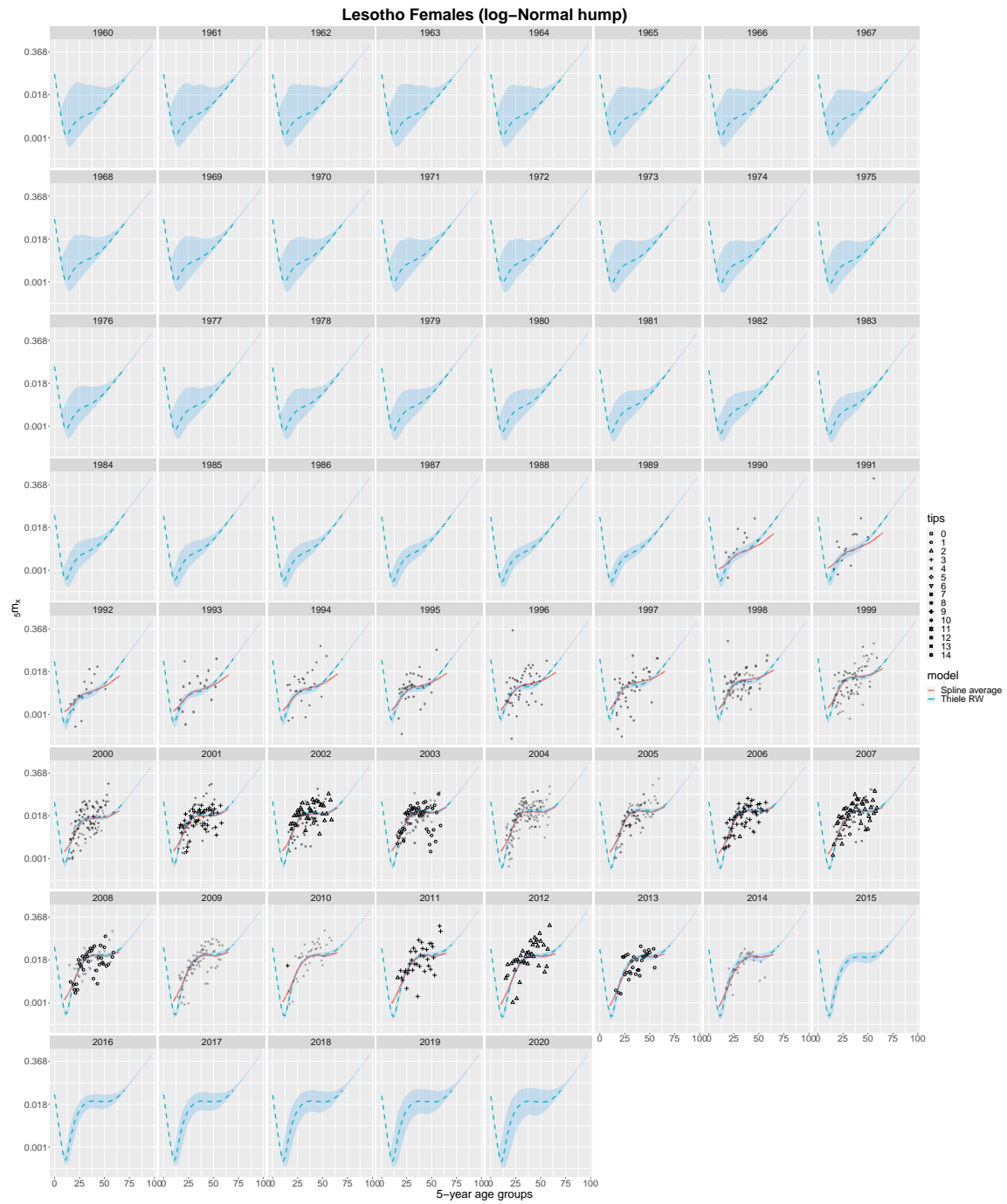


Figure 7: Mortality Schedules

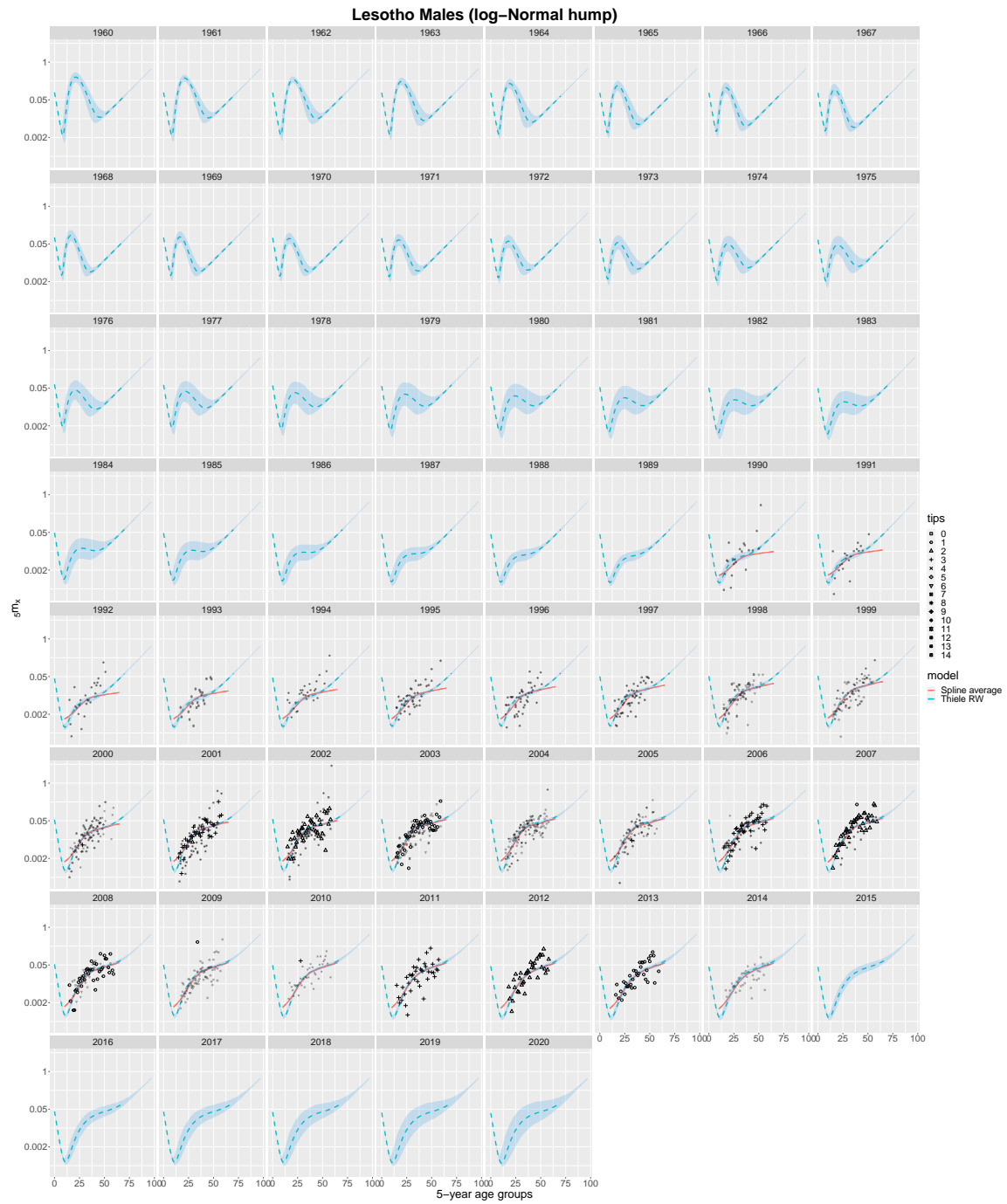


Figure 8: Mortality Schedules

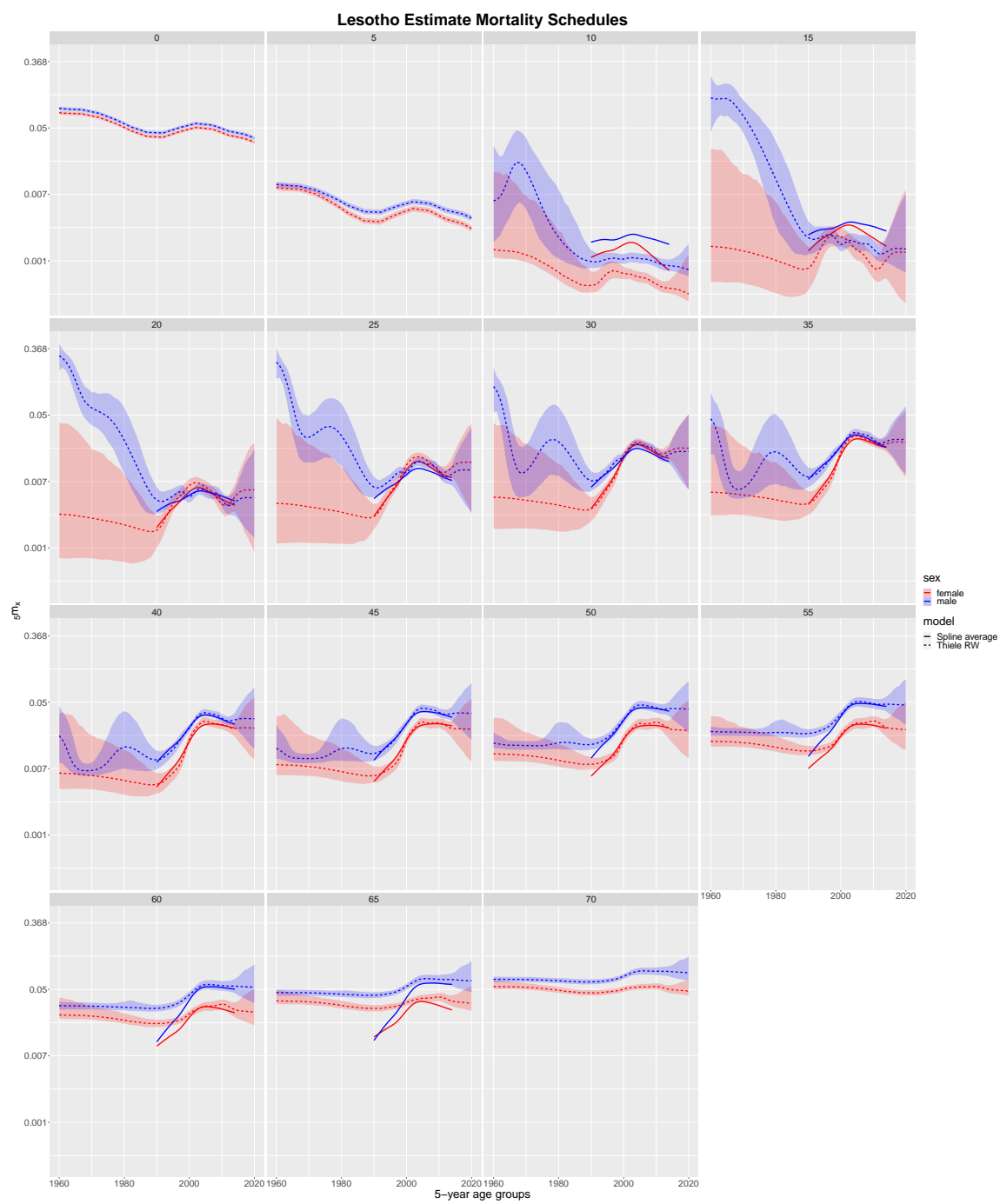


Figure 9: Mortality Schedules

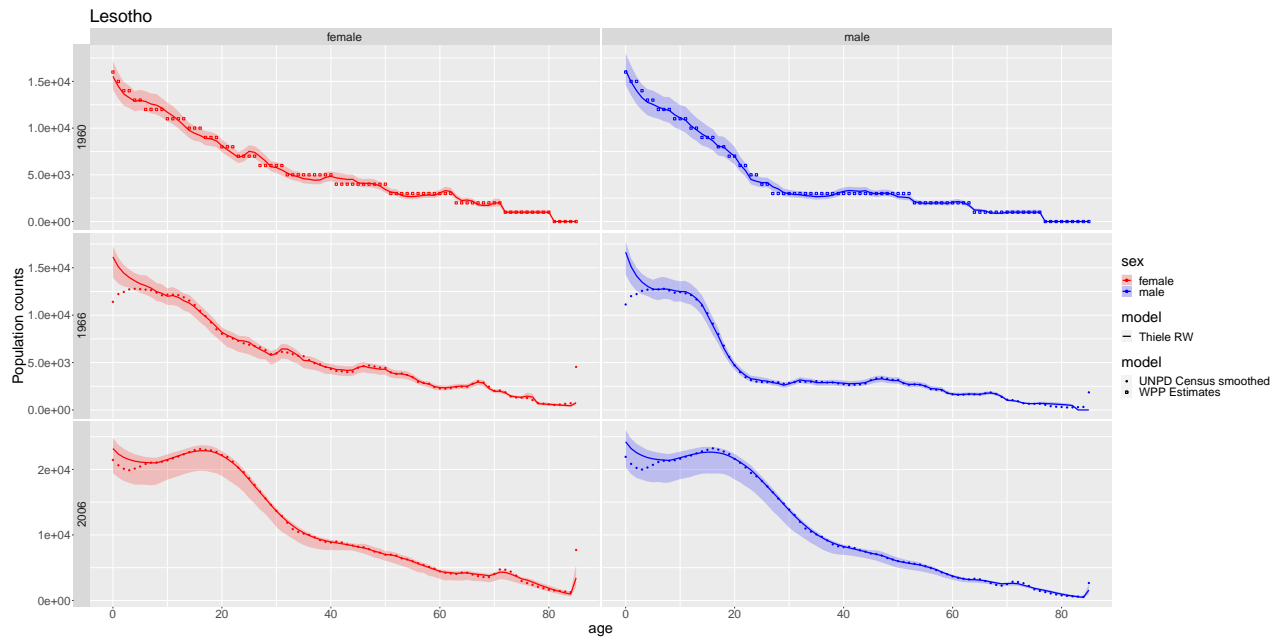


Figure 10: Population

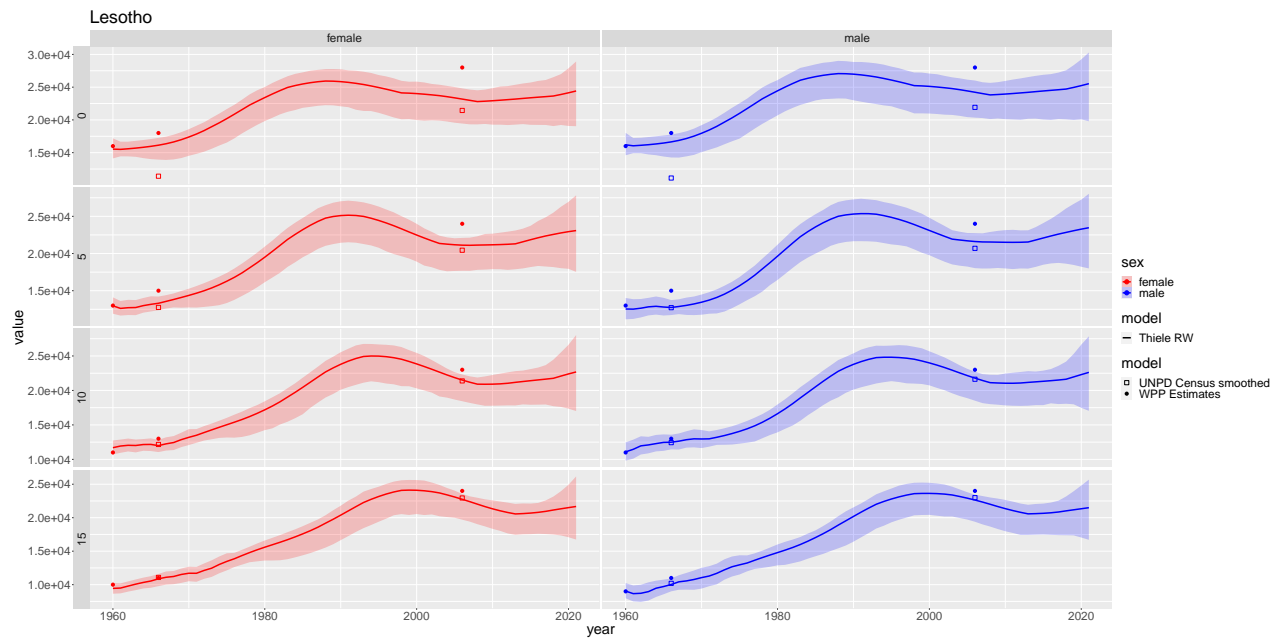


Figure 11: Population

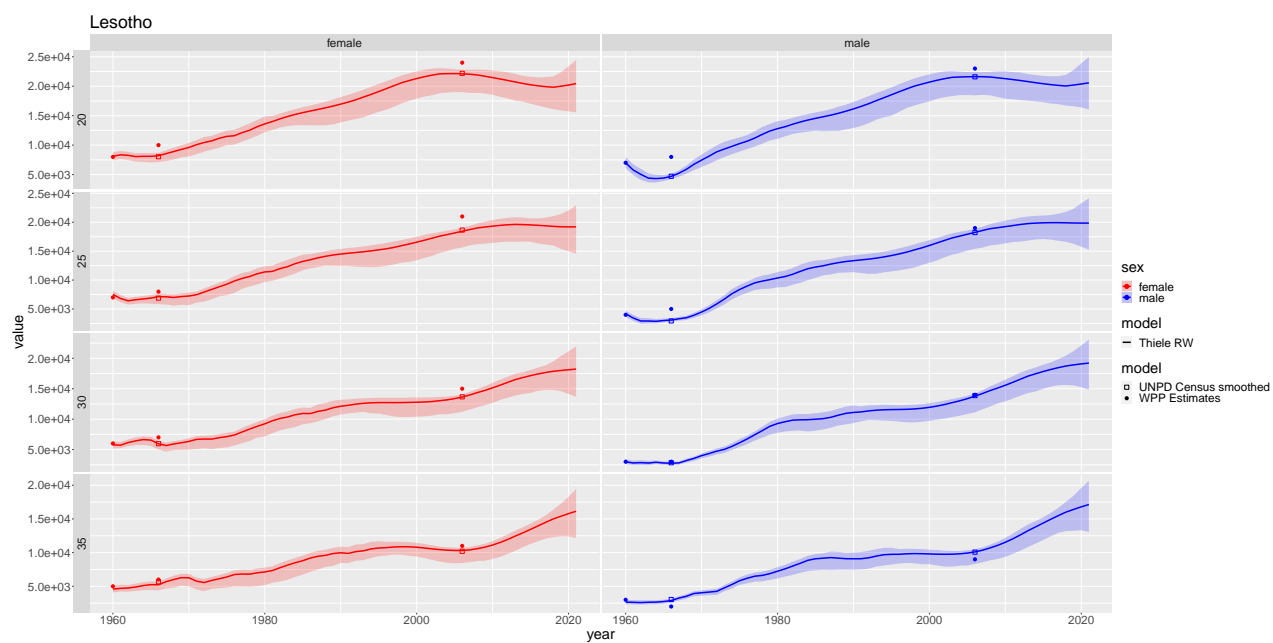


Figure 12: Population

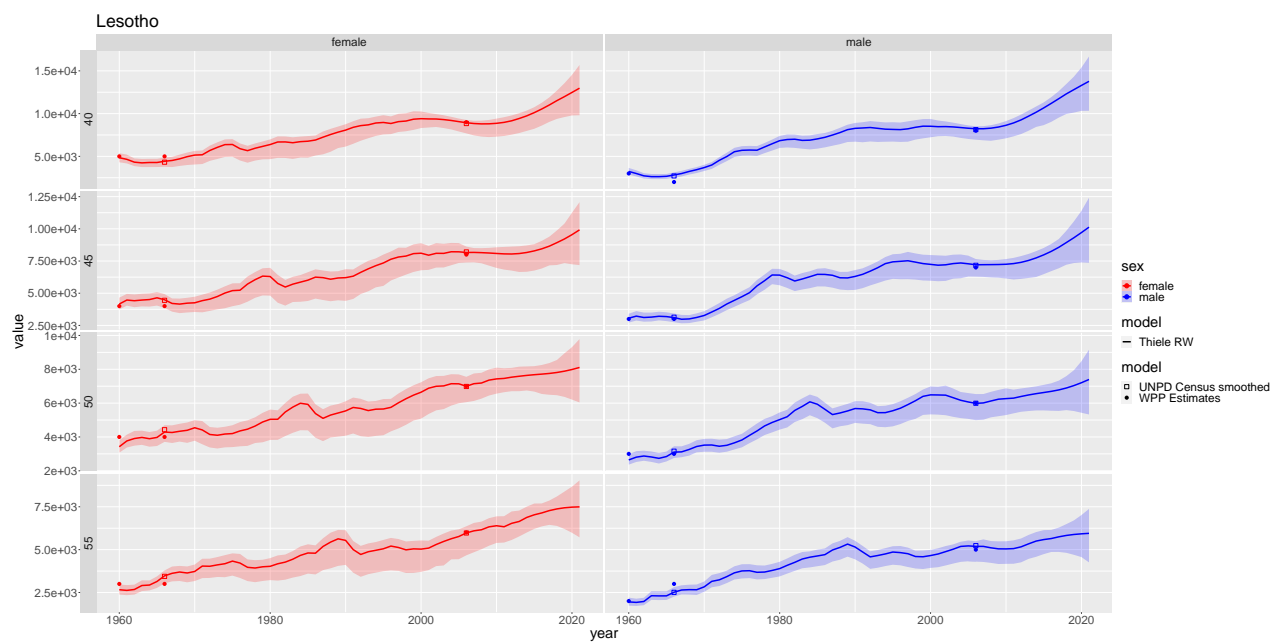


Figure 13: Population

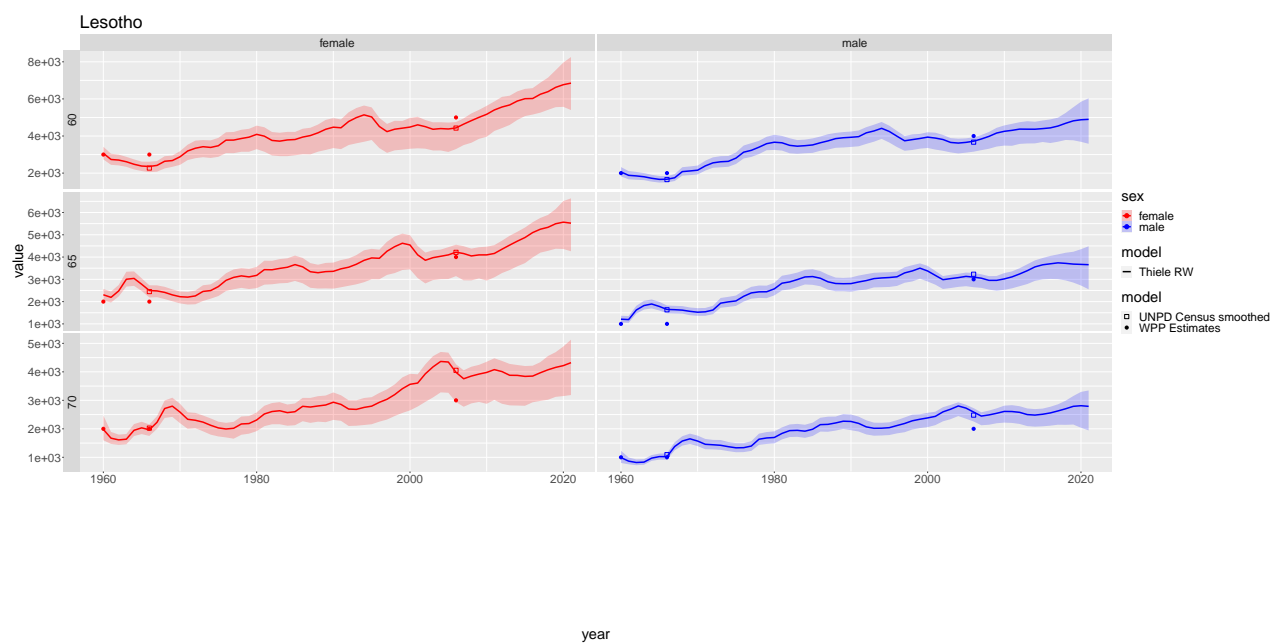


Figure 14: Population

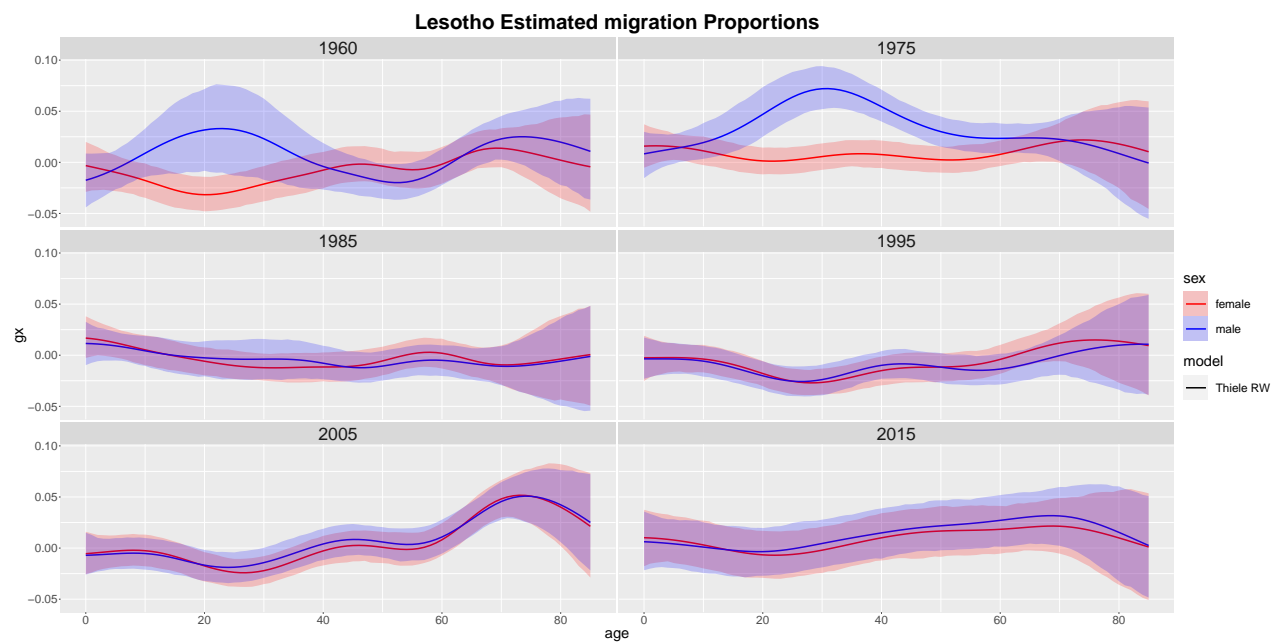


Figure 15: Migration

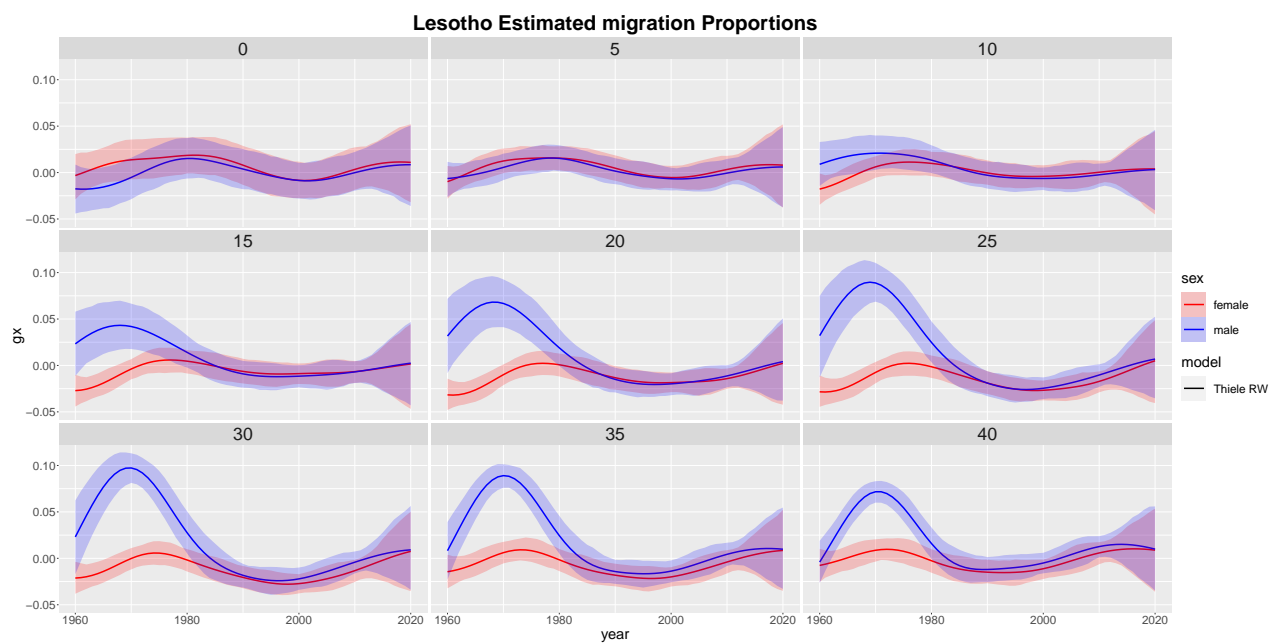


Figure 16: Migration

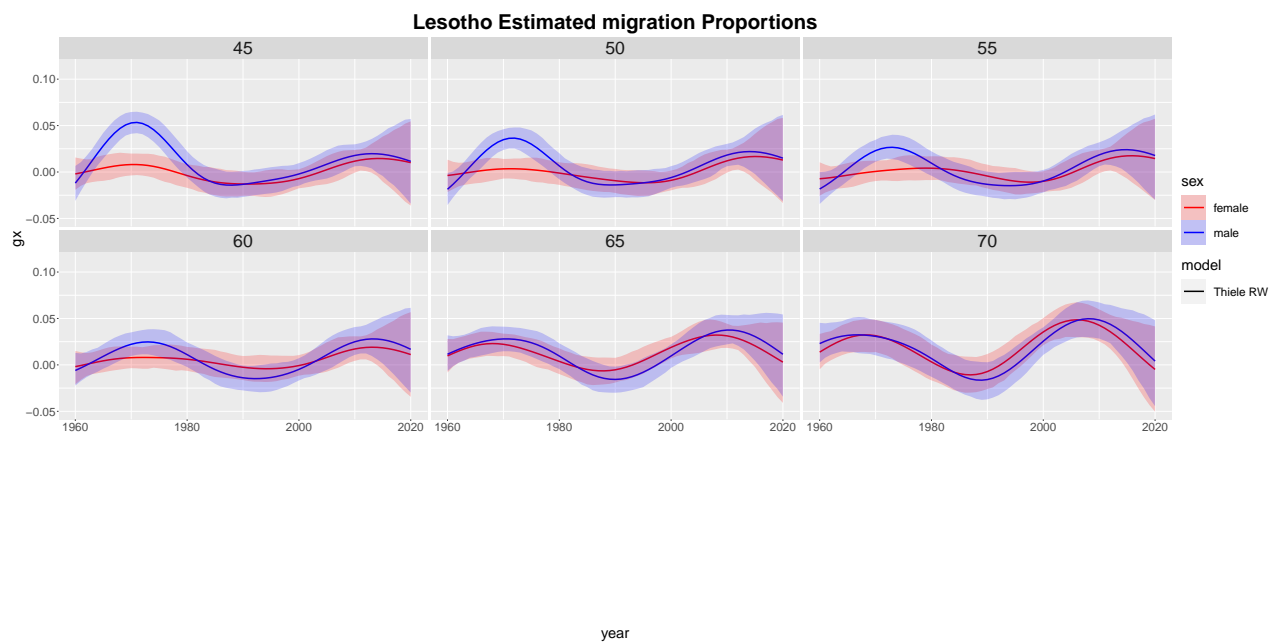


Figure 17: Migration

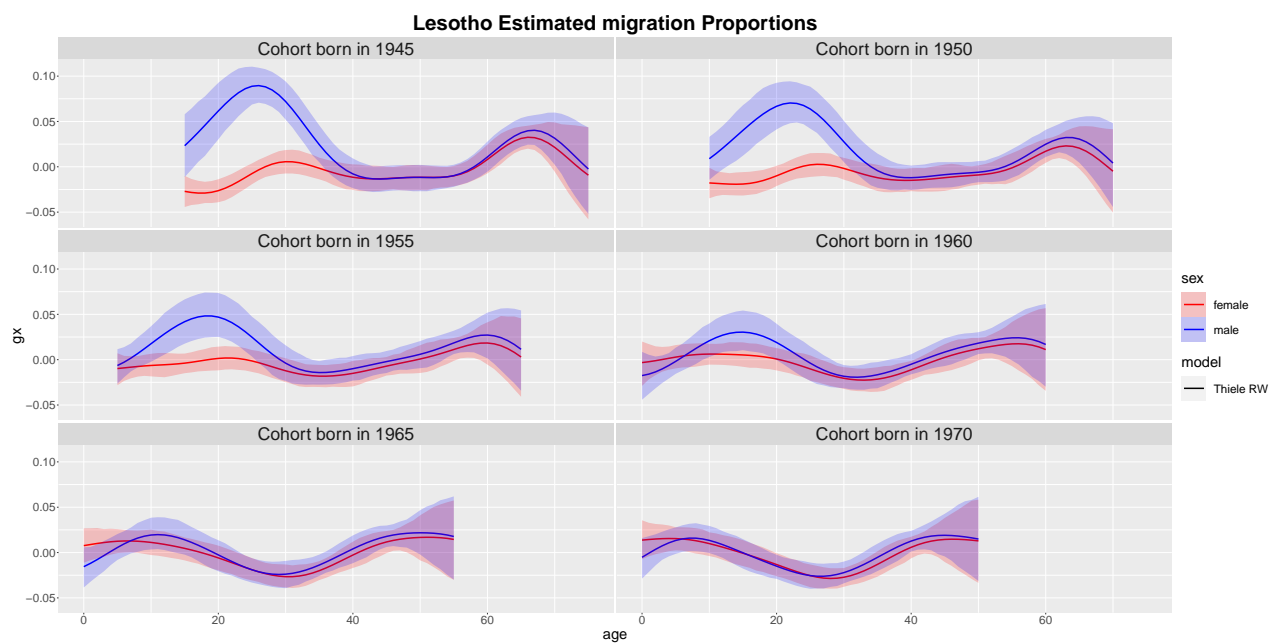


Figure 18: Migration

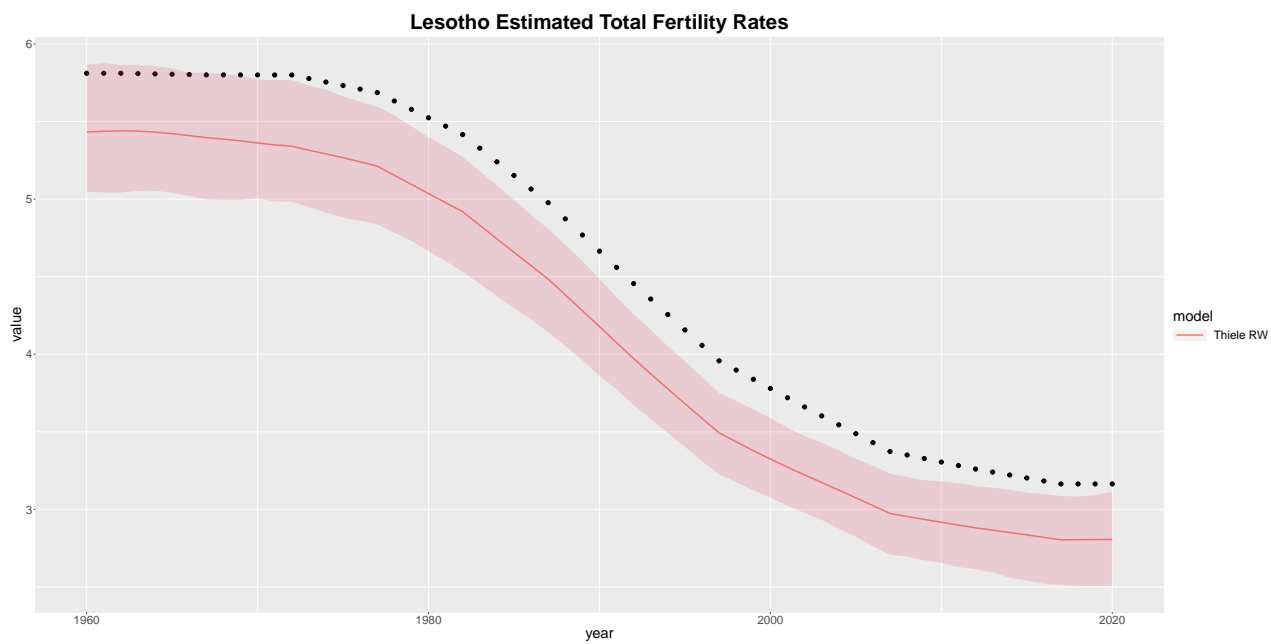


Figure 19: Total Fertility

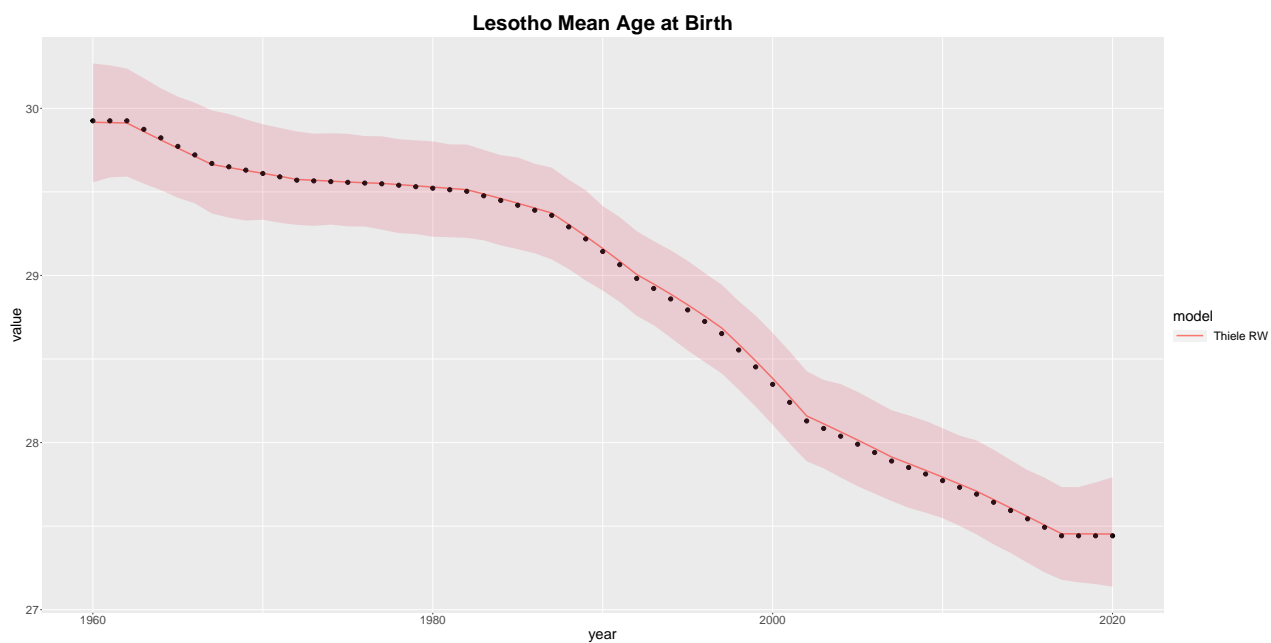


Figure 20: Mean age at births

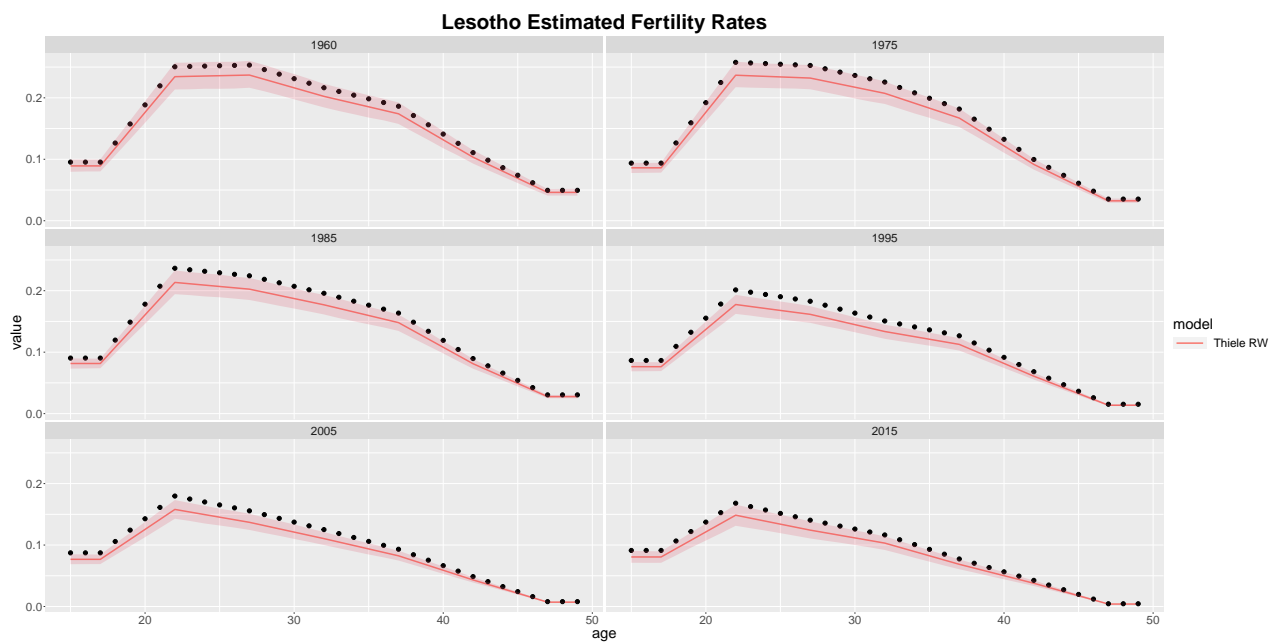


Figure 21: Fertility

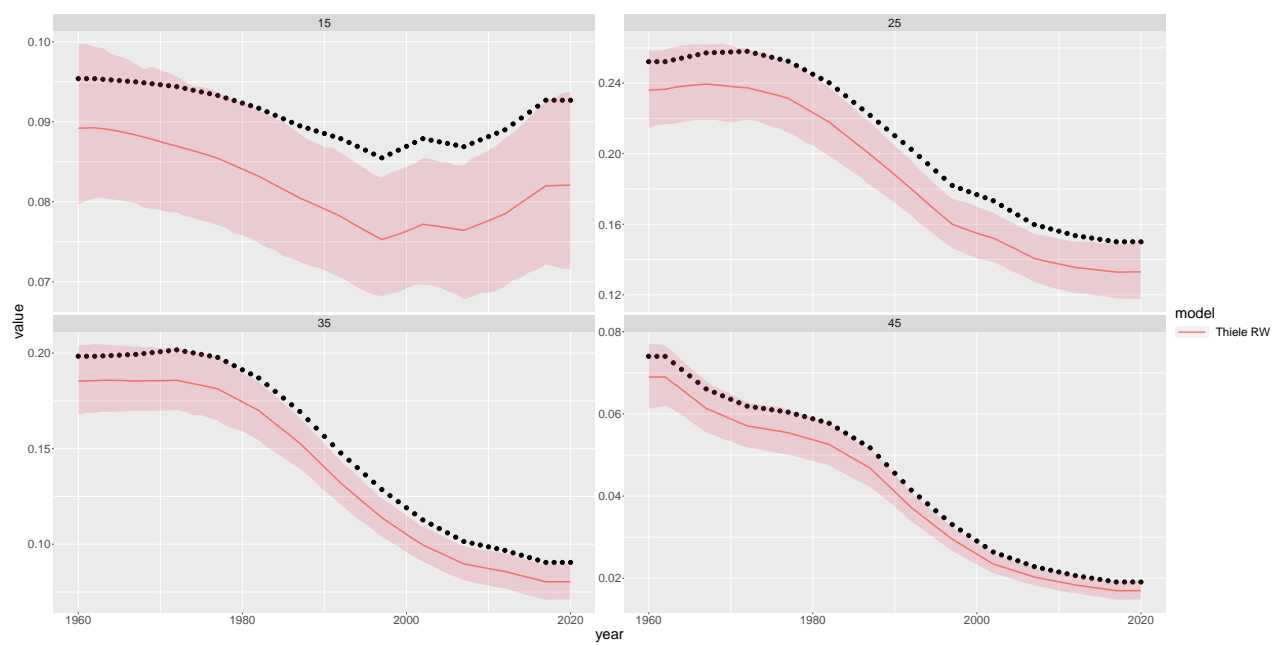


Figure 22: Fertility