

Mali

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

```
## # A tibble: 18 x 5
```

```
##   aggr.age `1976` `1987` `1998` `2009`
## *   <dbl>   <dbl>   <dbl>   <dbl>   <dbl>
## 1      0 589461. 713518. 824505 1320900.
## 2      5 469318. 587737. 752056. 1140163.
## 3     10 365111. 454909. 626383. 935907.
## 4     15 313740. 372253. 514432. 776702.
## 5     20 283085. 329380. 426025. 651759.
## 6     25 256486. 293568. 357175. 544213.
## 7     30 221242. 249780. 305540. 441083.
## 8     35 176439. 204643. 254144. 346151.
## 9     40 140031. 168372. 204333. 279300.
## 10    45 112098. 138593. 164032. 230165.
## 11    50 92157. 114941. 134674. 187778.
## 12    55 77736. 96562. 110227. 148978.
## 13    60 65678. 81473. 90043. 116856.
## 14    65 48225. 61222. 68496. 87673.
## 15    70 32268. 40138. 47588. 62602.
## 16    75 22262. 20646. 25240. 36935.
## 17    80 17833. 28025.      0 44491.
## 18    85 14930.      NA      NA      NA
```

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

```
## # A tibble: 18 x 5
```

```
##   aggr.age `1976` `1987` `1998` `2009`
## *   <dbl>   <dbl>   <dbl>   <dbl>   <dbl>
## 1      0 587090. 719841. 839795 1353138.
## 2      5 478652. 609625. 784428 1184616.
## 3     10 371670. 471434. 649420. 960509.
## 4     15 294640. 352163. 496697. 741664.
## 5     20 236401. 274904. 378379. 570403.
## 6     25 201103. 230469. 303352. 461460.
## 7     30 183257. 202136. 263623. 393090.
## 8     35 162001. 178354. 231512. 332552.
## 9     40 137909. 156129. 194900. 279044.
## 10    45 116691. 134533. 161088. 233669.
## 11    50 99549. 115354. 134245. 192469.
## 12    55 84109. 99363. 113027. 156346.
## 13    60 67783. 83852. 94609. 125246.
## 14    65 47273. 62772. 73709. 94561.
## 15    70 30306. 40520. 52309. 67163.
## 16    75 20072. 21079. 29751. 41651.
## 17    80 14093. 25047.      0 42759.
## 18    85 14057.      NA      NA      NA
```

Thiele log-Normal Hump RW

```
## Warning in fit_tmb(input.thiele.loghump.oag.vec.RW, inner_verbose = FALSE, : convergence error: false c
```

```
##      user  system elapsed
##      3.87    0.11    3.97
```

```
## [1] "false convergence (8)"
```

Thiele log-Normal Hump RW (Pop 5-9 to 70-74, DHS 15-19 to 45-49)

```
## Warning in fit_tmb(input.thiele.loghump.oag.vec.RW.re, inner_verbose = FALSE, : convergence error: fals
```

```
##      user  system elapsed
##      4.17    0.21    4.39
```

```
## [1] "false convergence (8)"
```

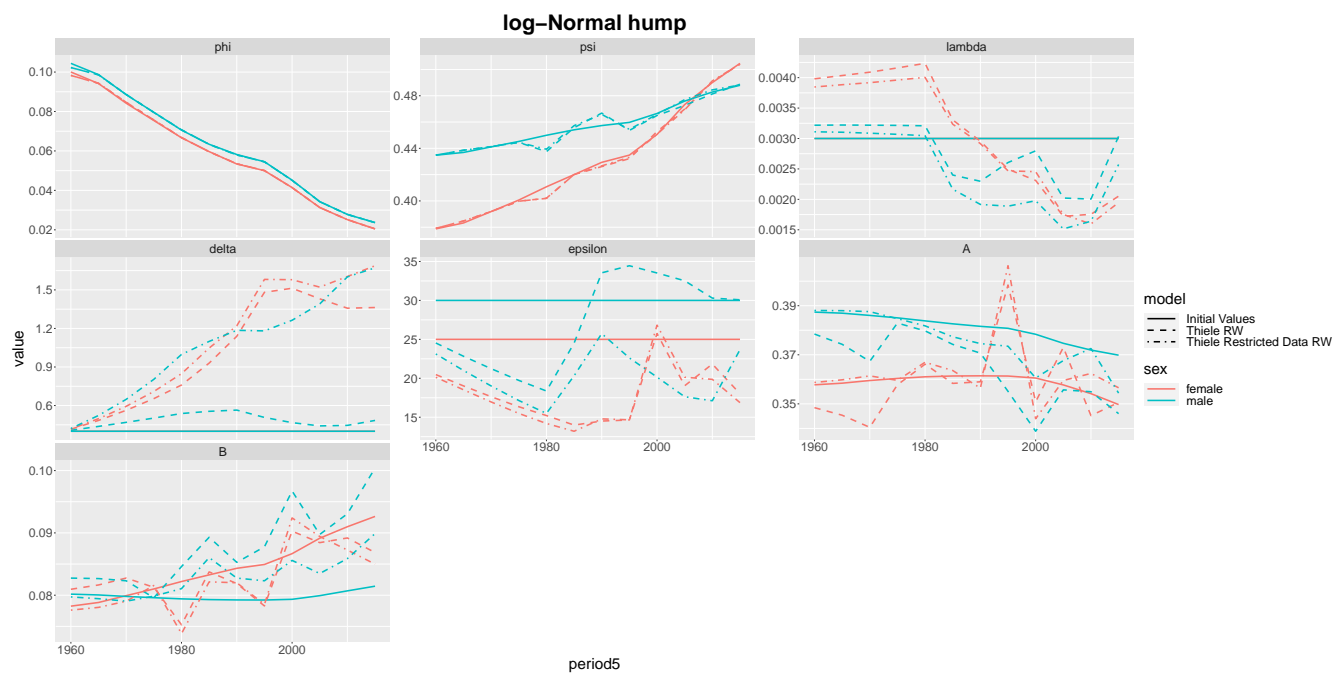


Figure 1: Estimated parameters

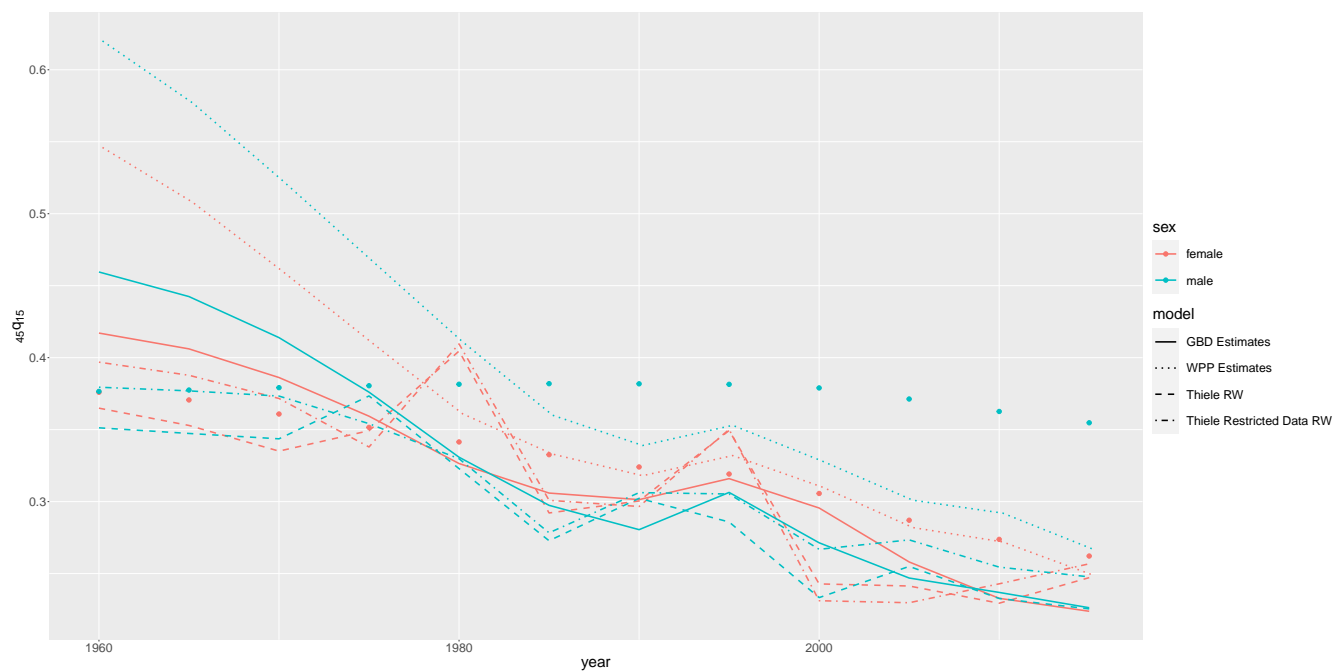


Figure 2: Estimated $_{45}q_{15}$

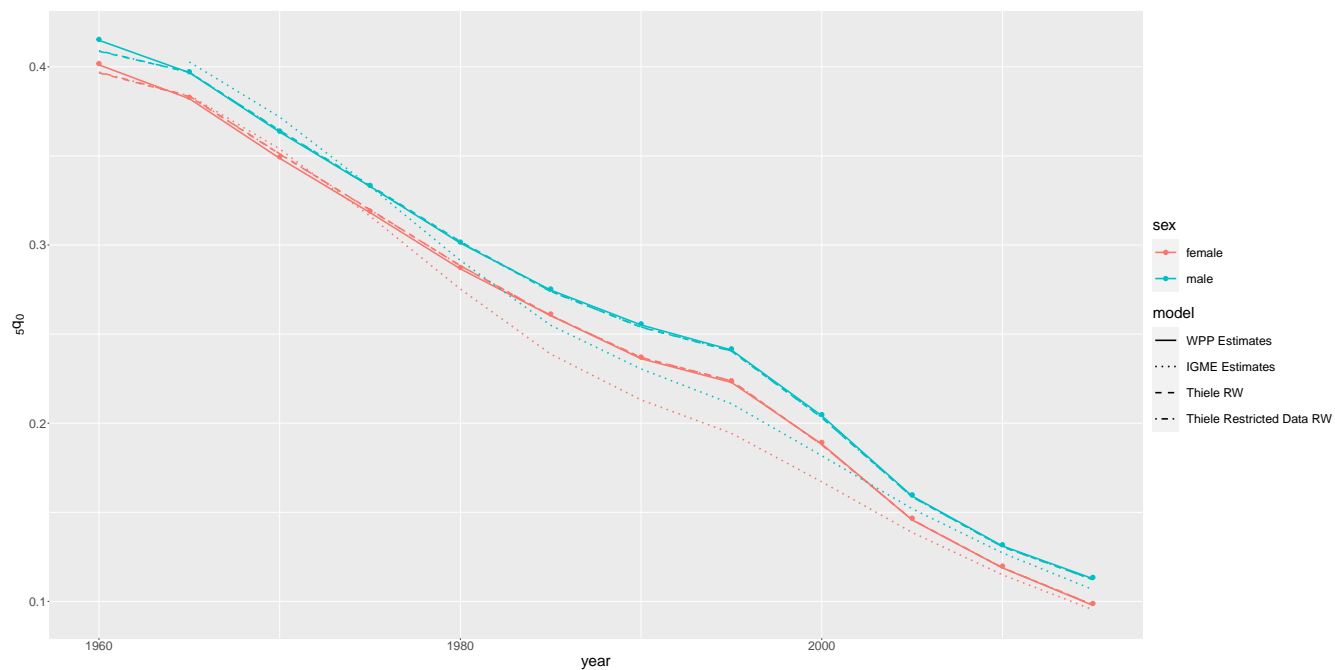


Figure 3: Estimated $_{5}q_0$

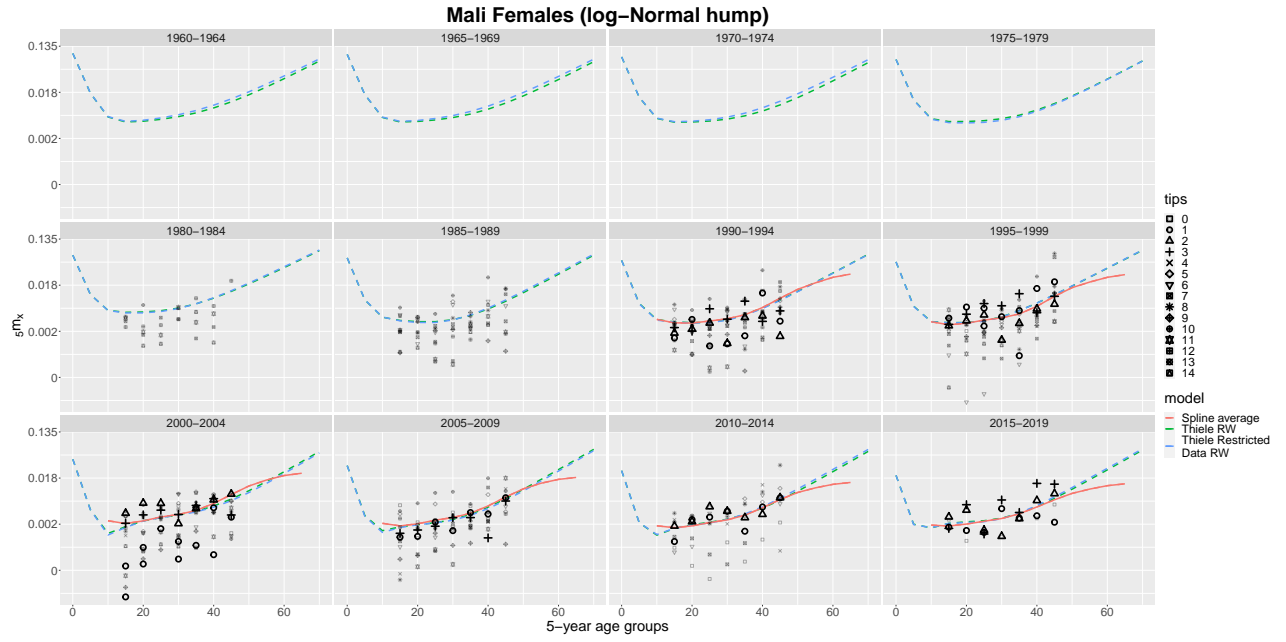


Figure 4: Mortality Schedules

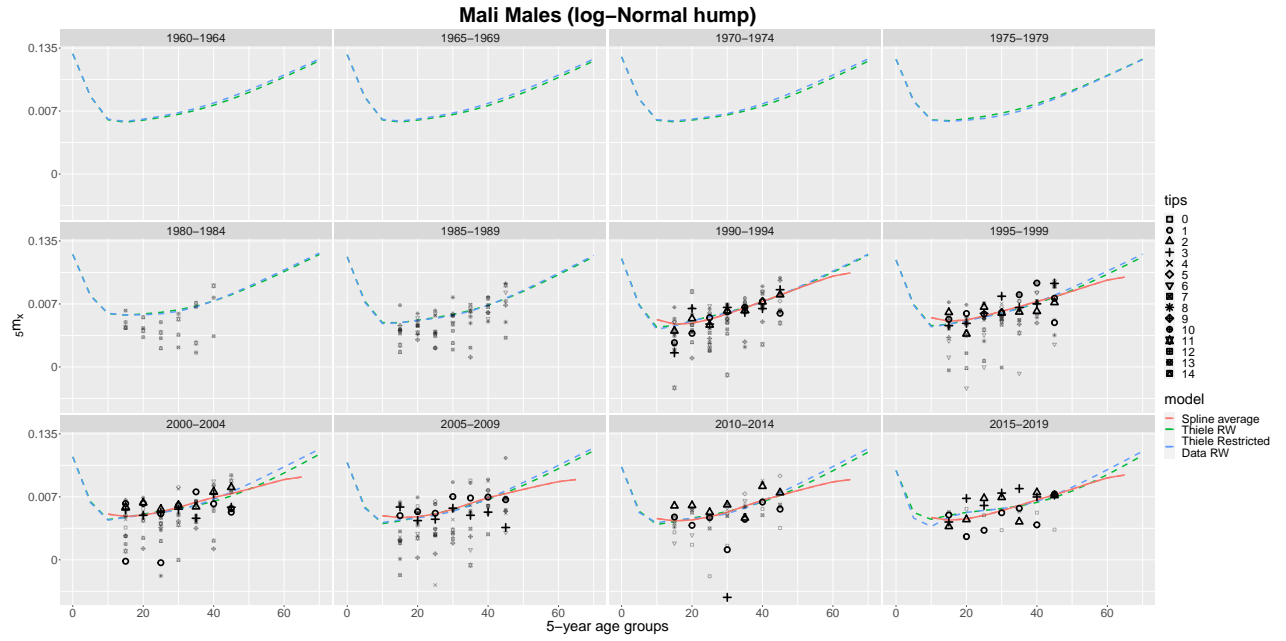


Figure 5: Mortality Schedules

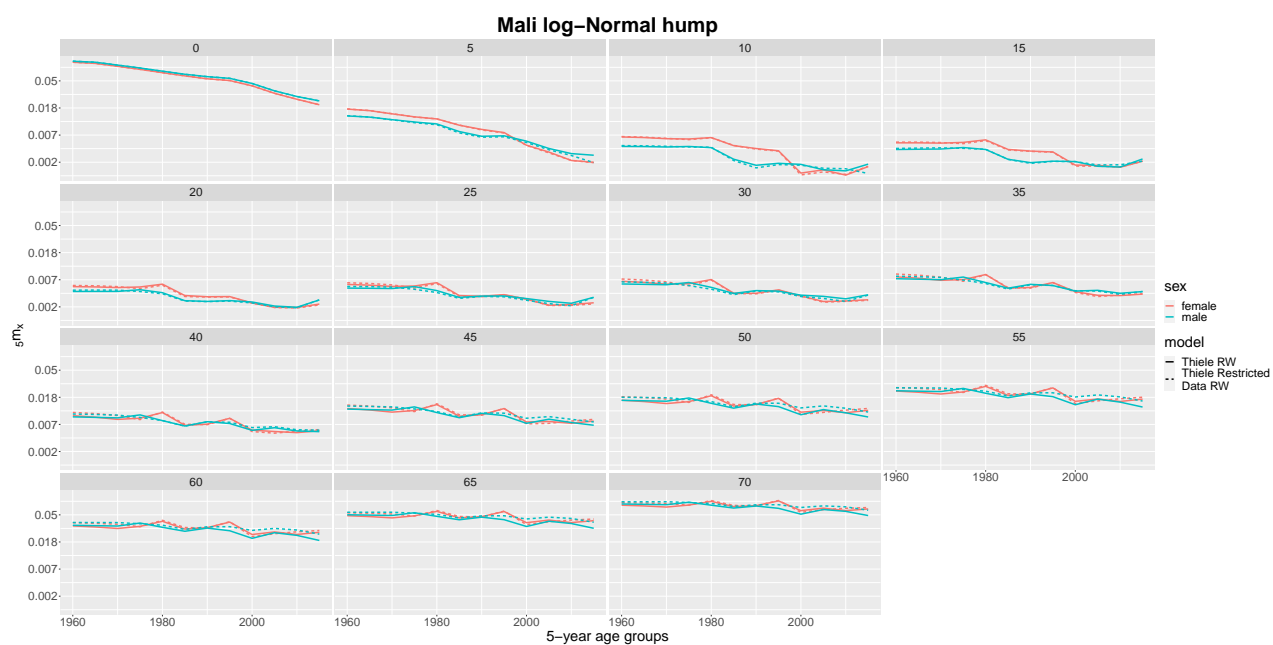


Figure 6: Mortality Schedules

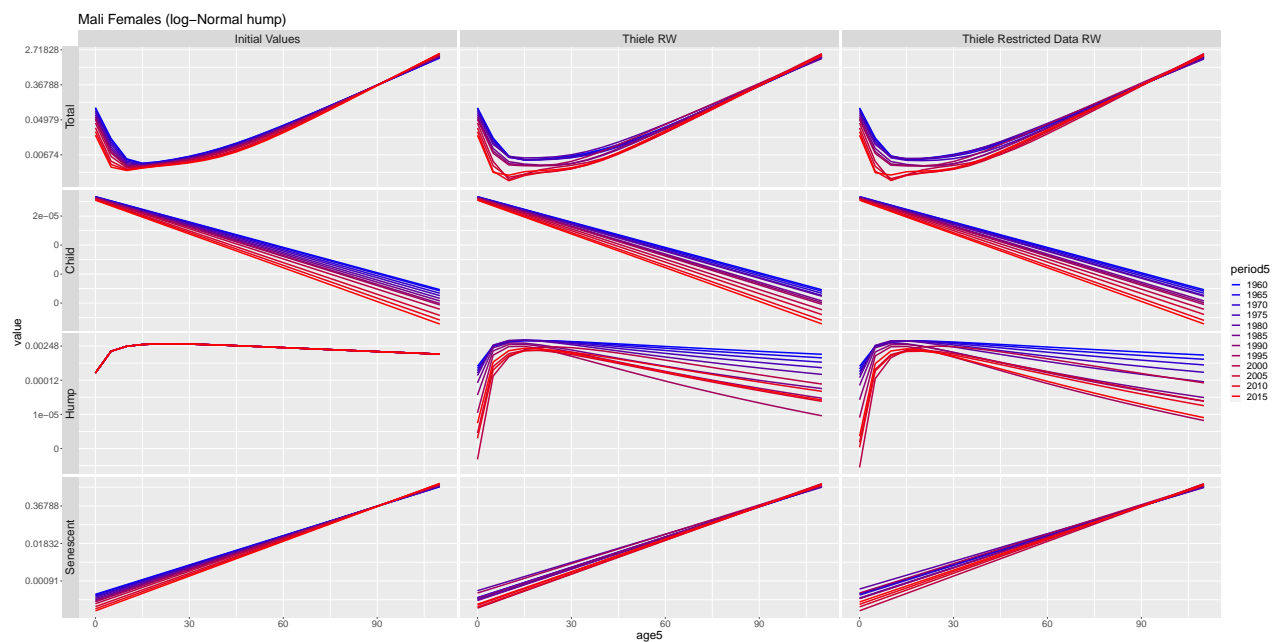


Figure 7: Thiele Decomposed

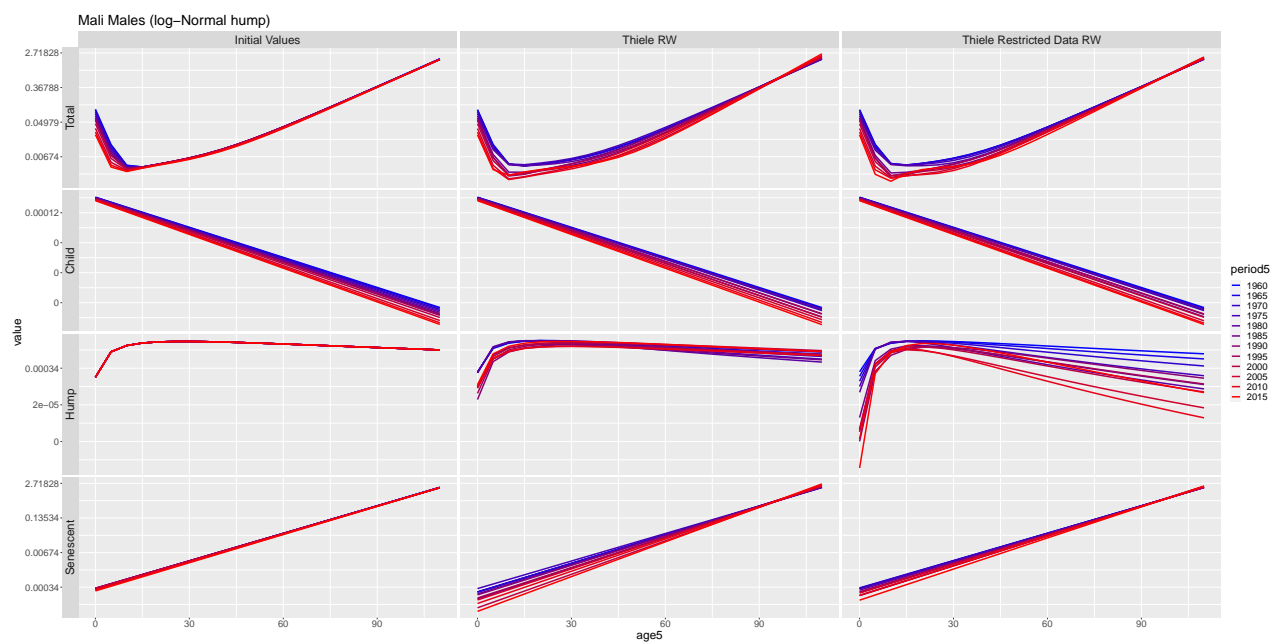


Figure 8: Thiele Decomposed

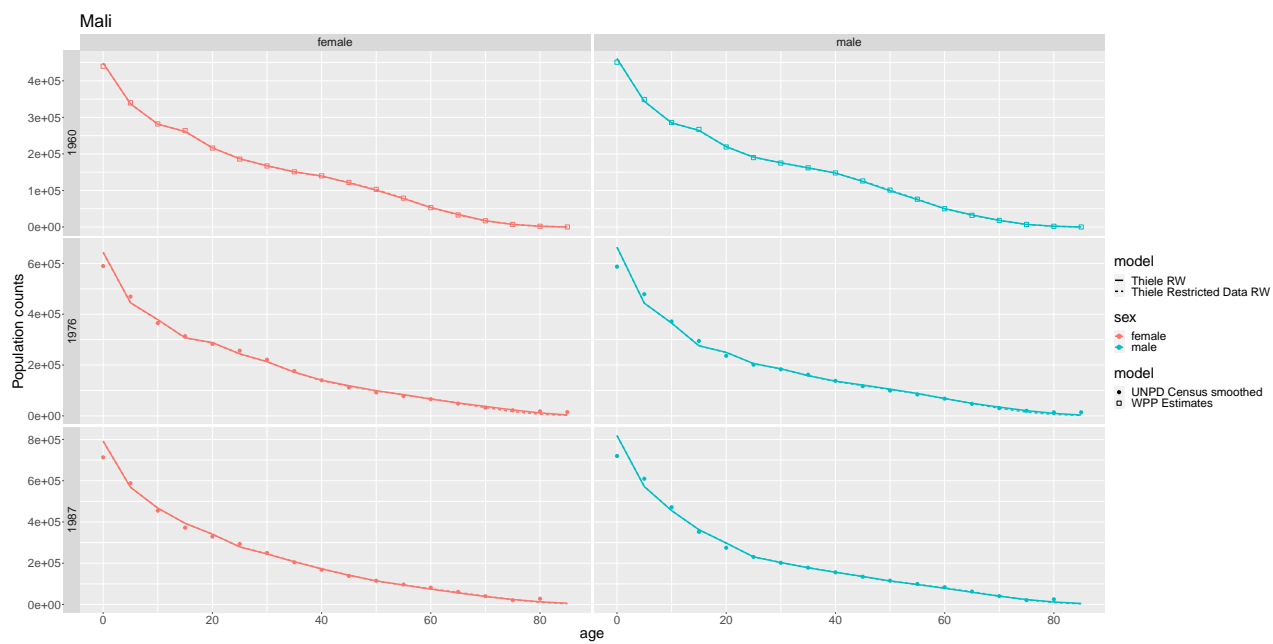


Figure 9: Population

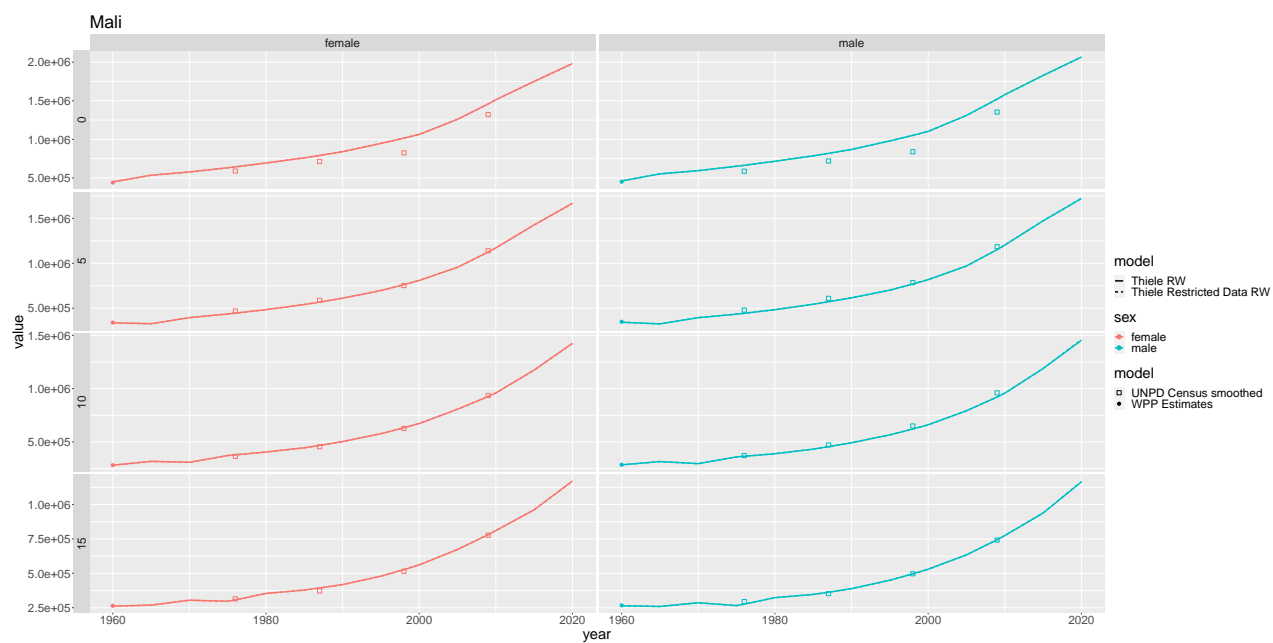


Figure 10: Population

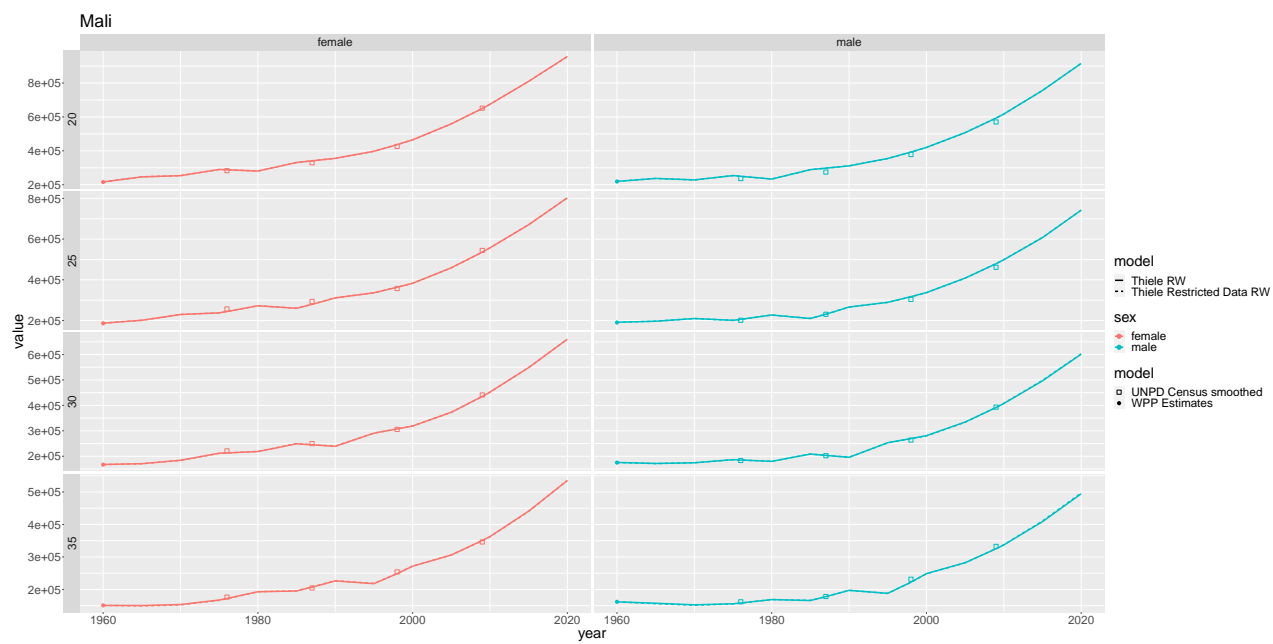


Figure 11: Population

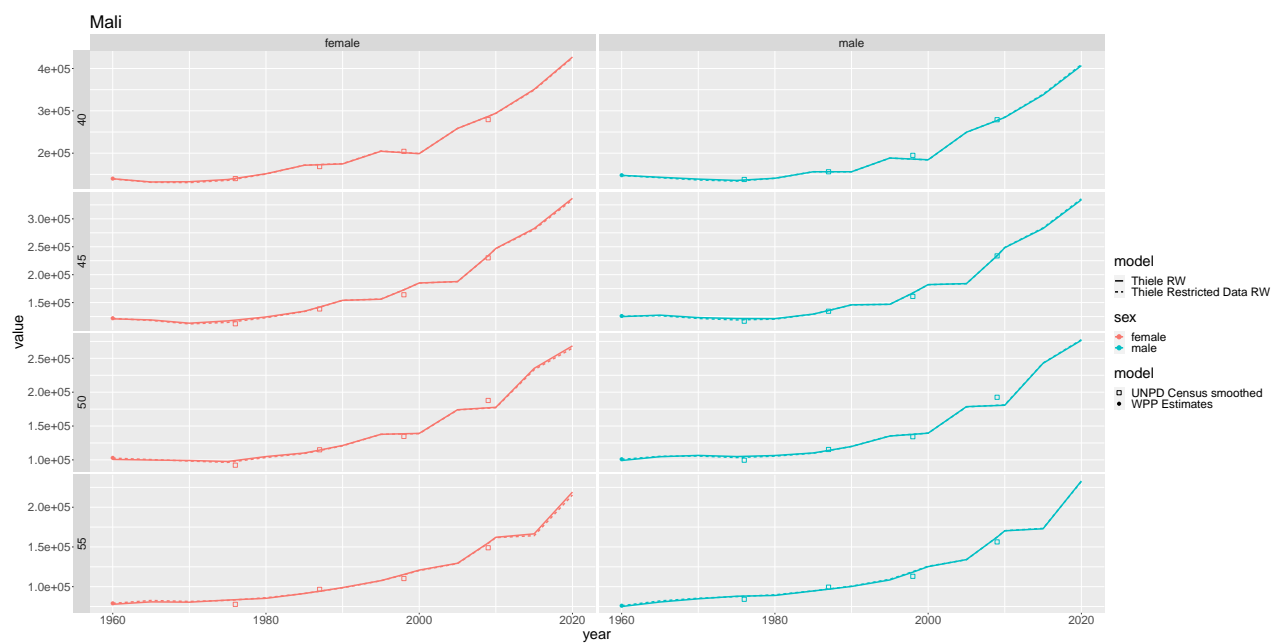


Figure 12: Population

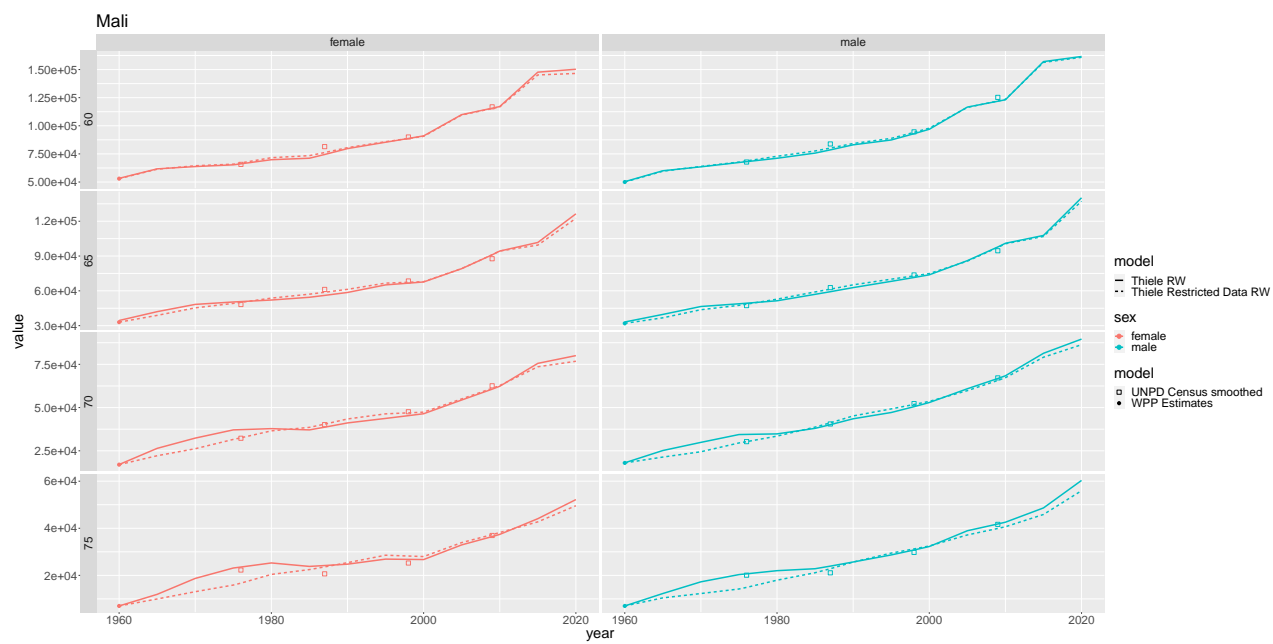


Figure 13: Population



Figure 14: Migration

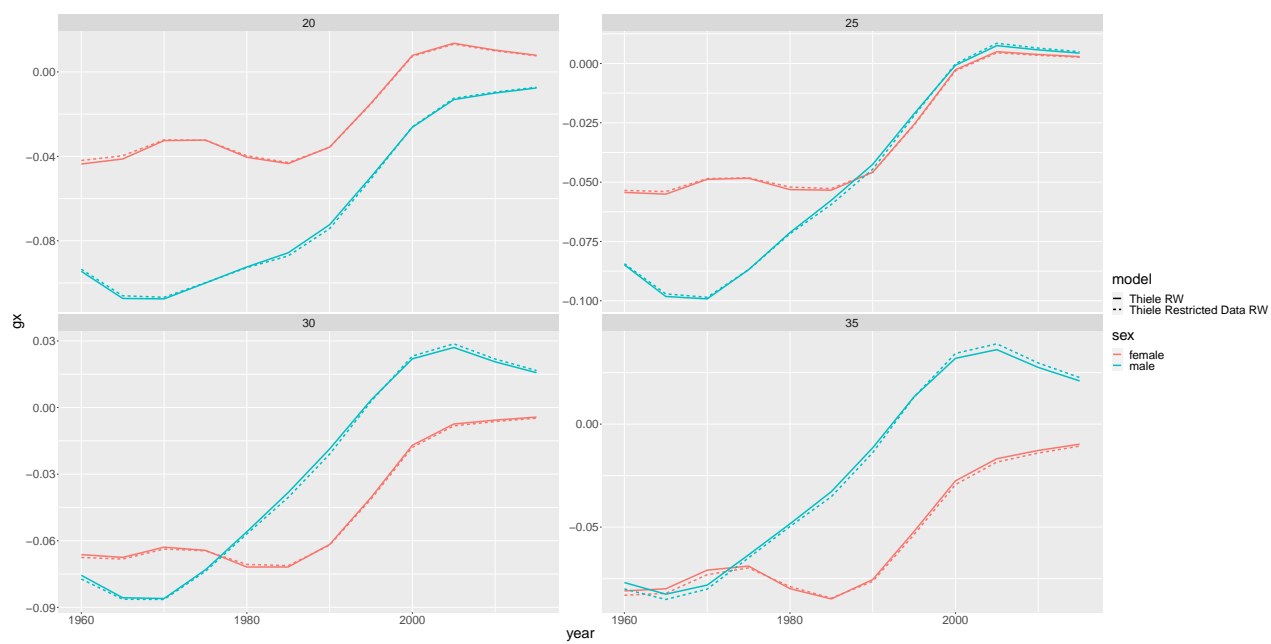


Figure 15: Migration

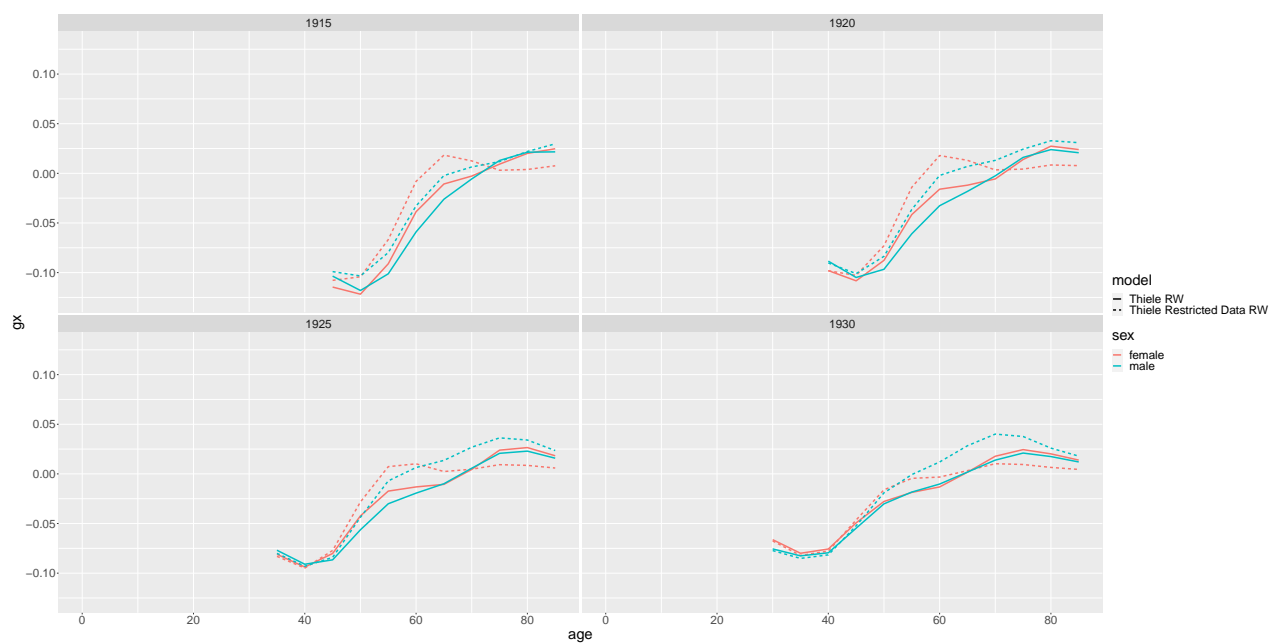


Figure 16: Migration

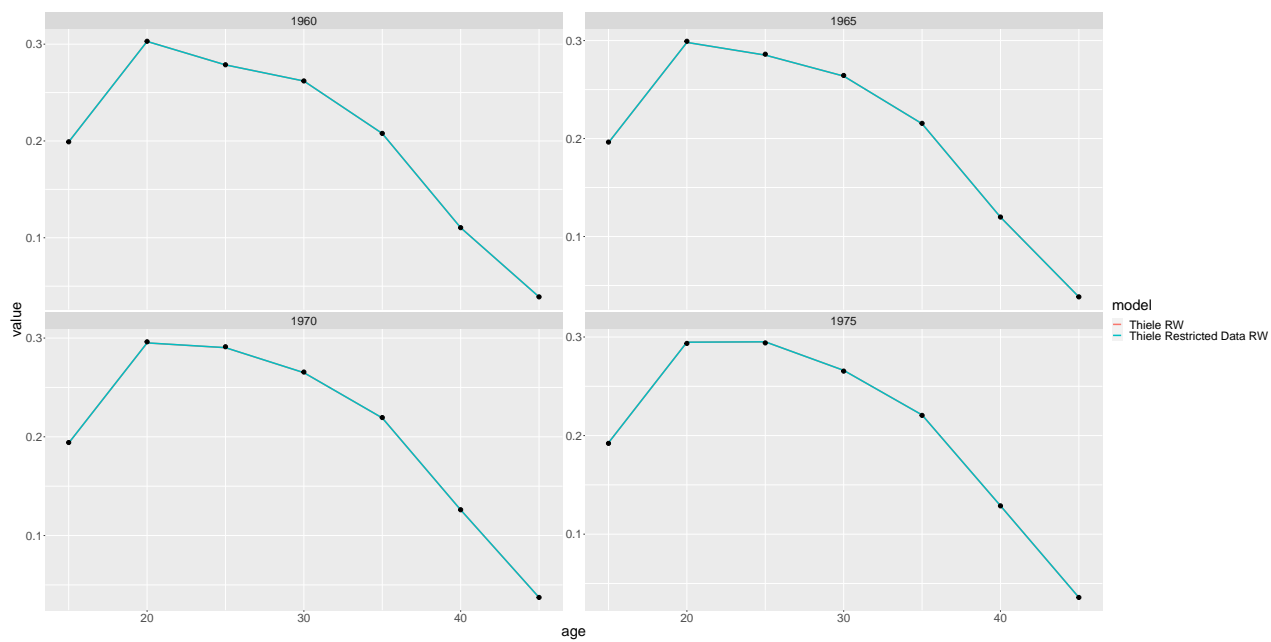


Figure 17: Fertility

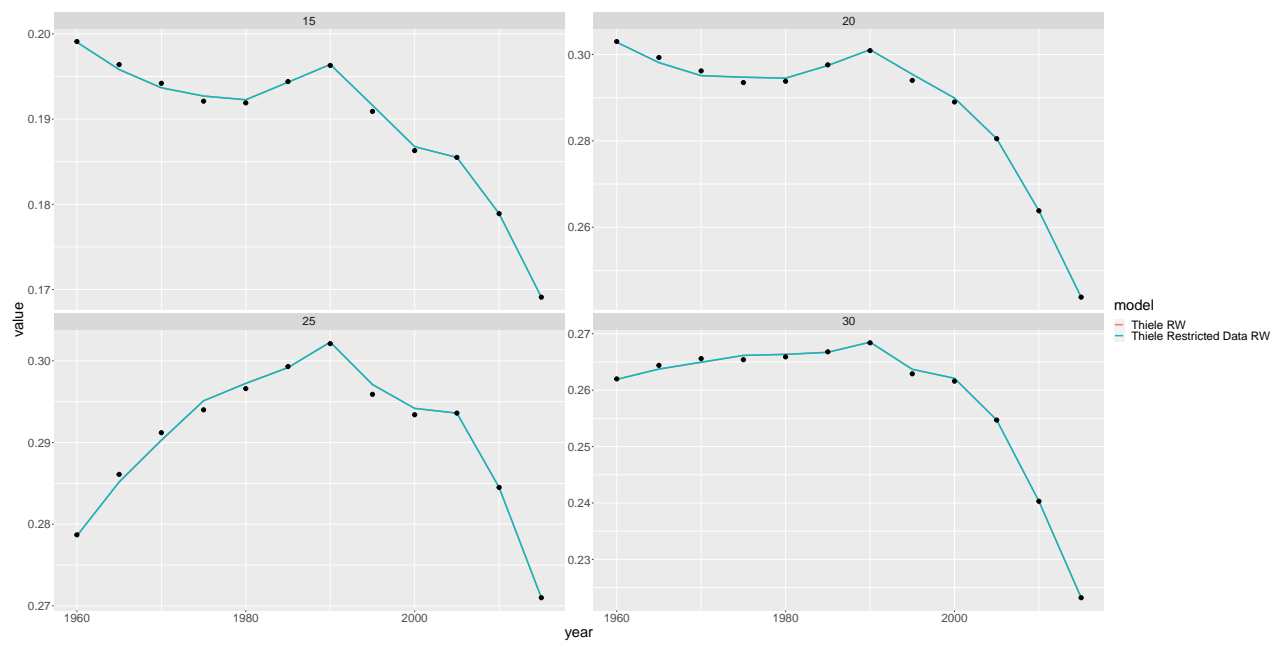


Figure 18: Fertility