Madagascar

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

```
## # A tibble: 18 x 3
##    aggr.age   `1993`   `2018`
##  *    <dbl>    <dbl>    <dbl>
##  1        0 1112652  1869627
##  2        5  887806. 1762906.
##  3       10  762170. 1687188.
##  4       15  681774. 1558576
##  5       20  578889. 1303623
##  6       25  476792. 1037778.
##  7       30  394886.  843737
##  8       35  317271.  711511.
##  9       40  242574.  596038.
## 10       45  186136.  478968.
## 11       50  153940.  377220.
## 12       55  130986.  293019.
## 13       60  105274   221754.
## 14       65   77069   151646.
## 15       70   51143.   94472
## 16       75   26121    58834.
## 17       80   26112    36225.
## 18       85      NA    37896
```

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

```
## # A tibble: 18 x 3
##    aggr.age   `1993`   `2018`
##  *    <dbl>    <dbl>    <dbl>
##  1        0 1121953  1854072
##  2        5  904633  1781609.
##  3       10  770146. 1689022.
##  4       15  665691. 1487291
##  5       20  549330. 1195236.
##  6       25  451859   955468.
##  7       30  383614.  793154.
##  8       35  317992.  681935
##  9       40  242723.  587396.
## 10       45  178846.  481191.
## 11       50  144310   379979
## 12       55  124371.  295242.
## 13       60  103204.  222801
## 14       65   79529.  149608.
## 15       70   55241.   88961.
## 16       75   28062    52439.
## 17       80   23935    30494.
## 18       85      NA    29556.
```

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
##    4.37    0.36    4.72
```

```
## [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
##    3.78    0.31    4.10
```

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

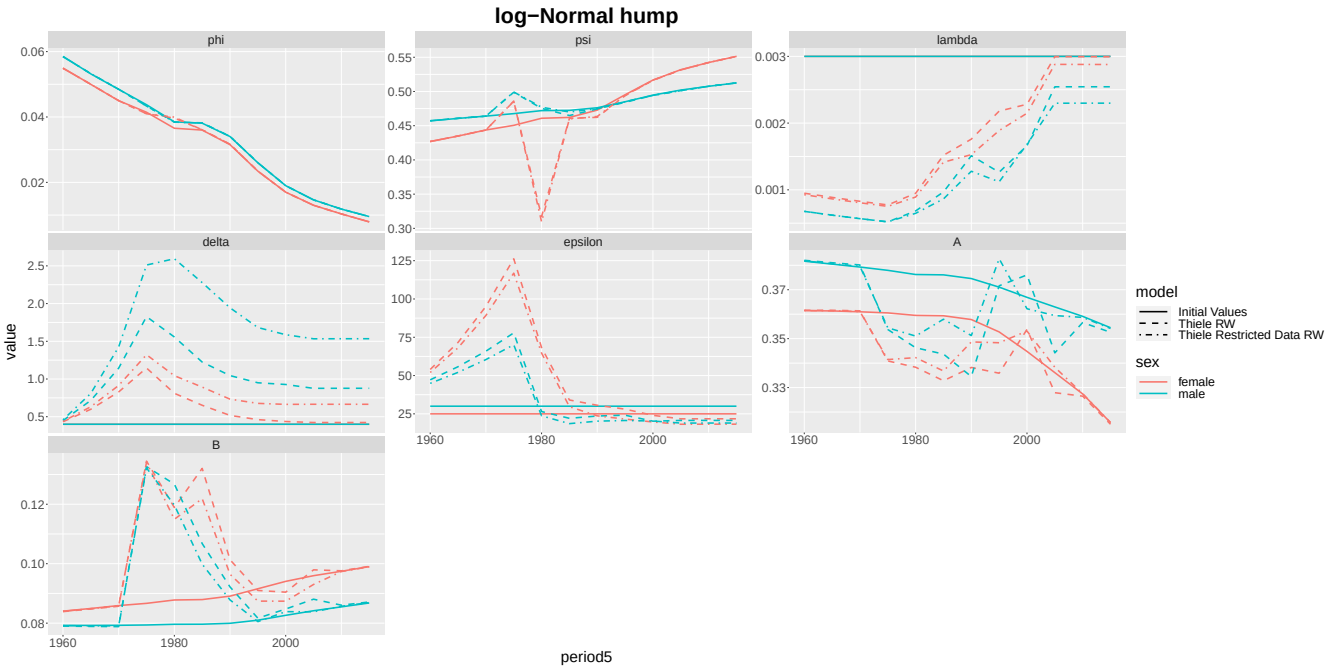

Figure 1: Estimated parameters

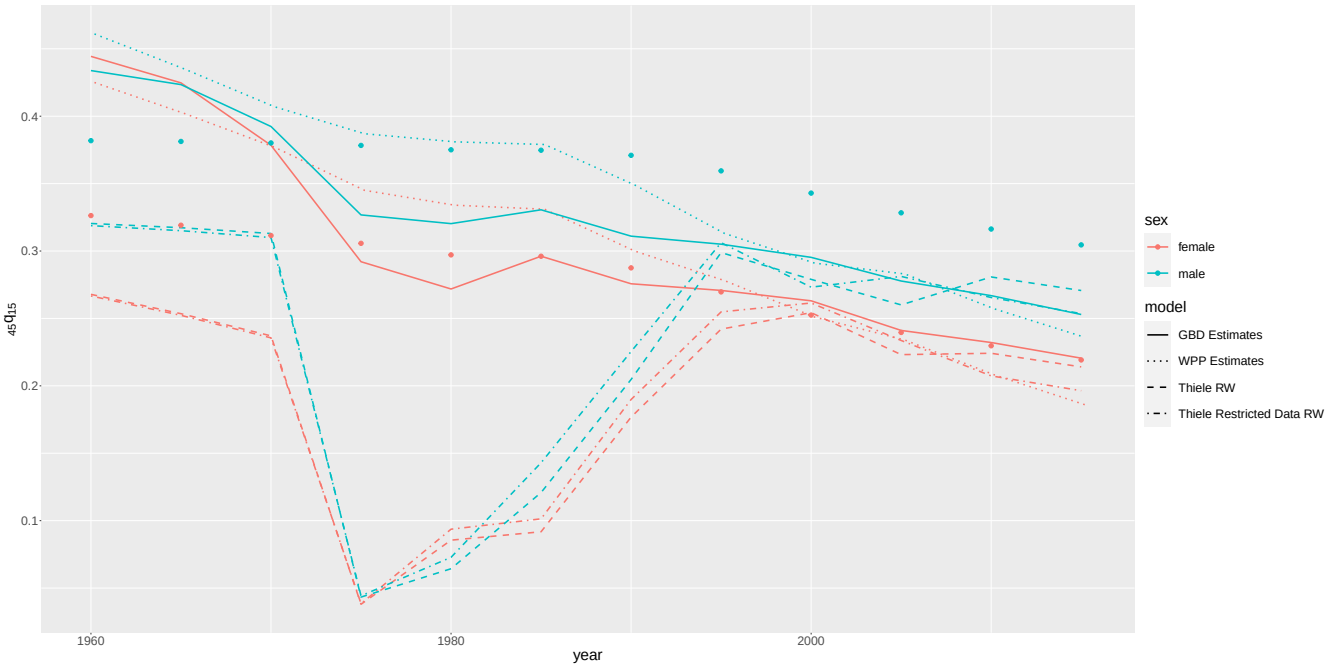

Figure 2: Estimated ${}_{45}q_{15}$

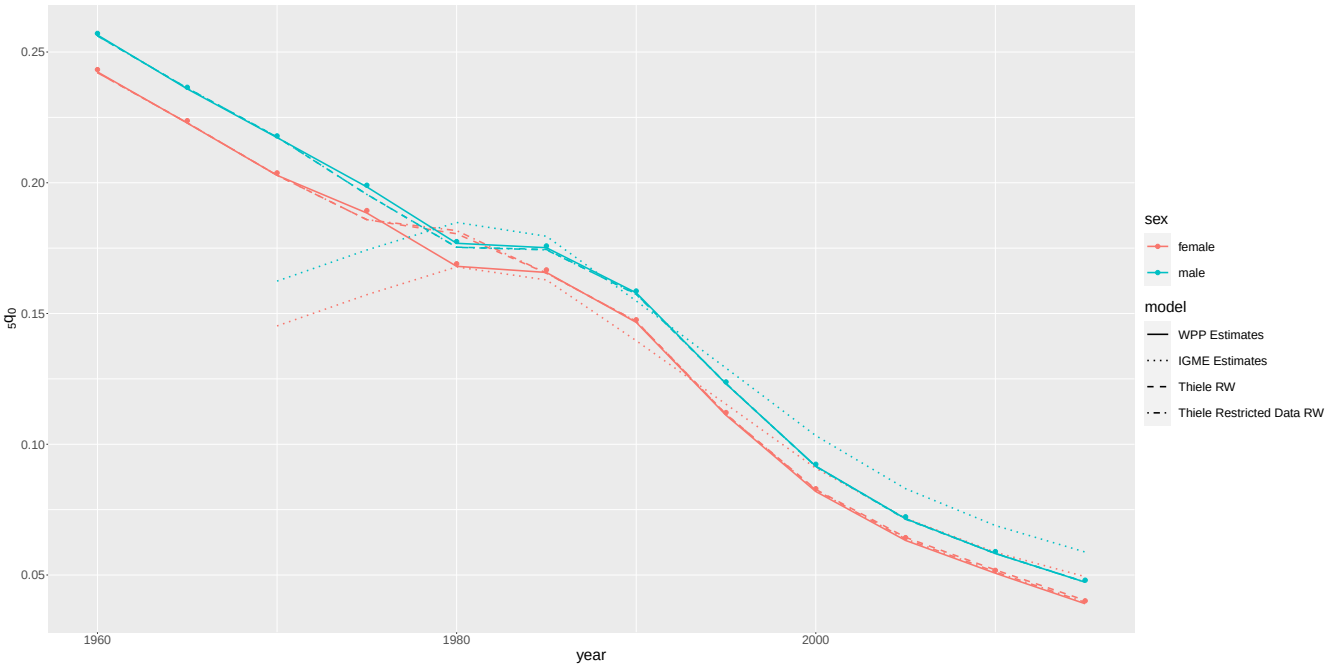

Figure 3: Estimated ${}_{5}q_{0}$

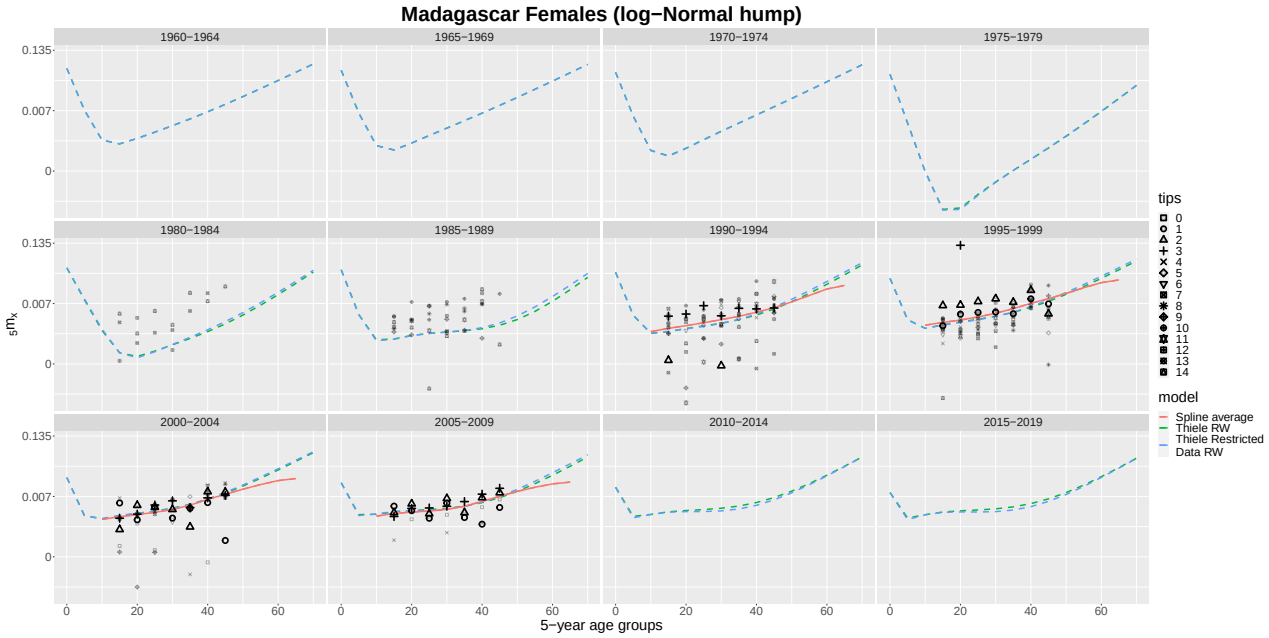

Figure 4: Mortality Schedules

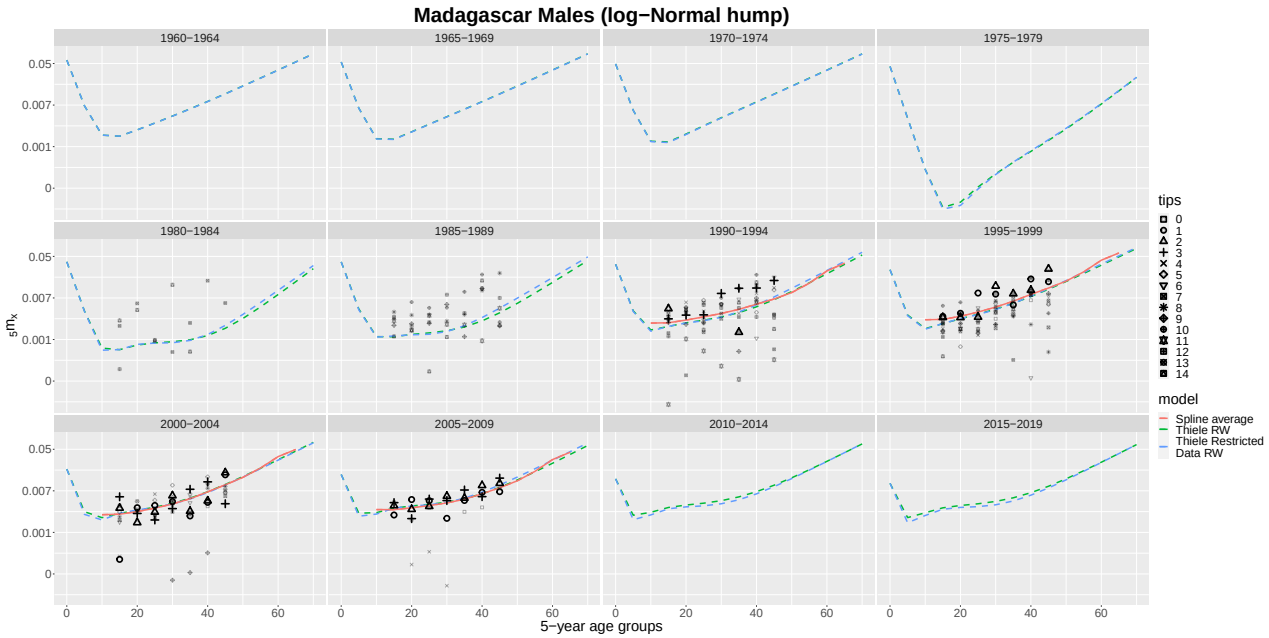

Figure 5: Mortality Schedules

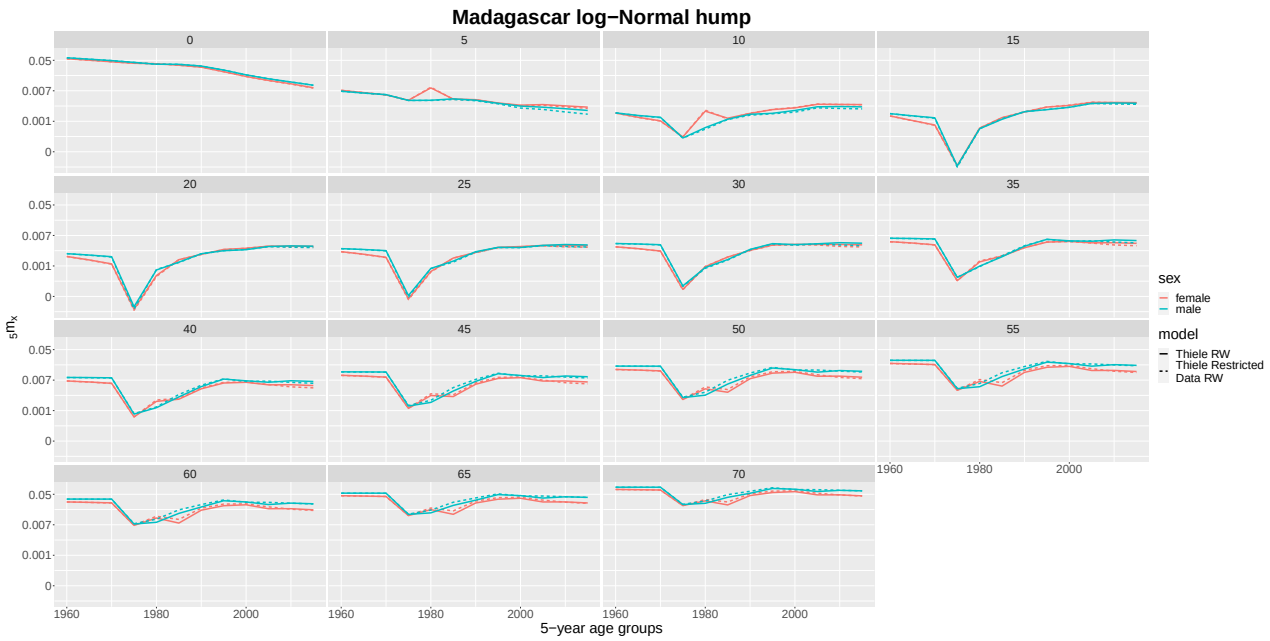

Figure 6: Mortality Schedules

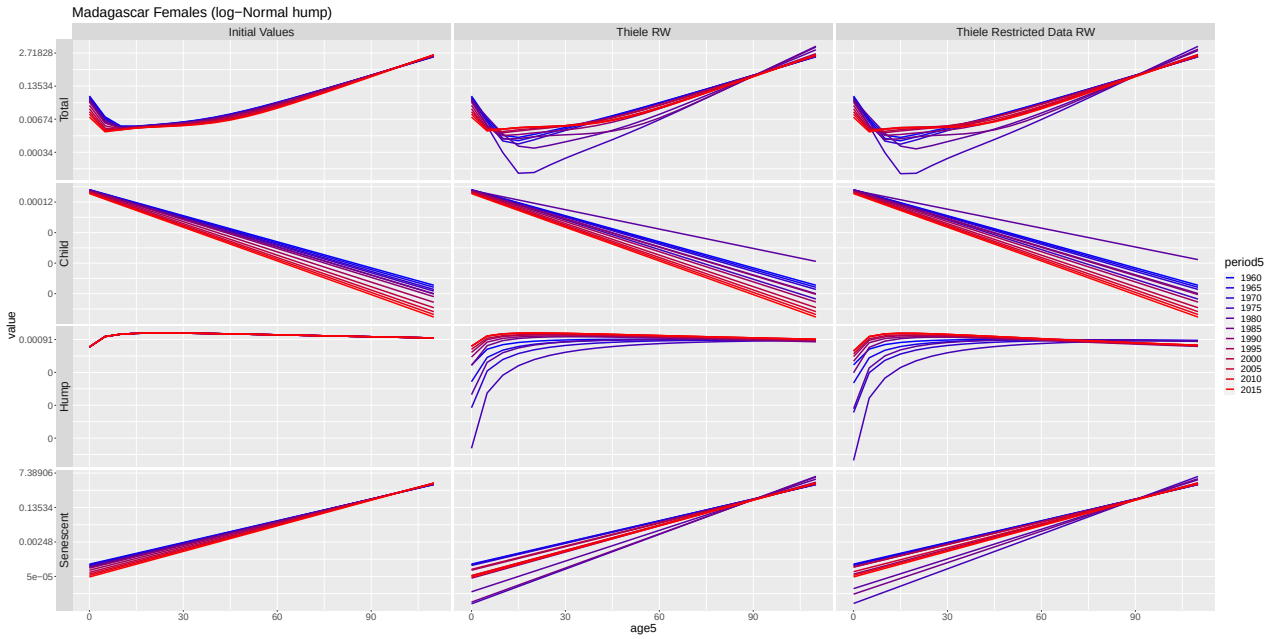

Figure 7: Thiele Decomposed

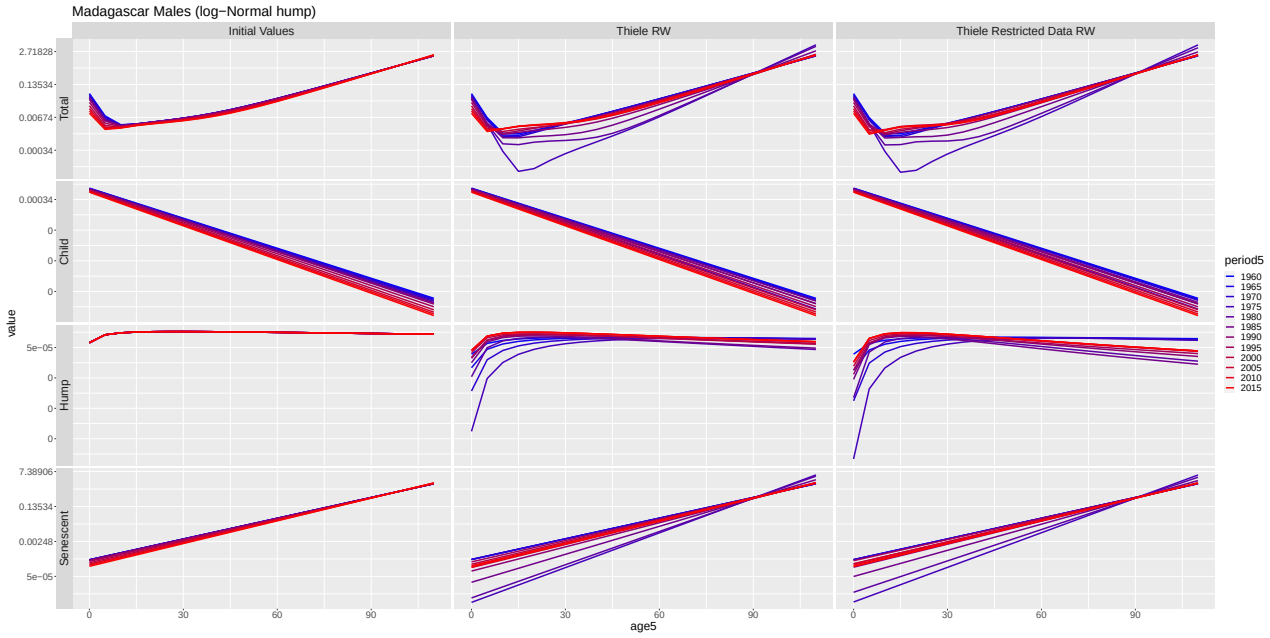

Figure 8: Thiele Decomposed

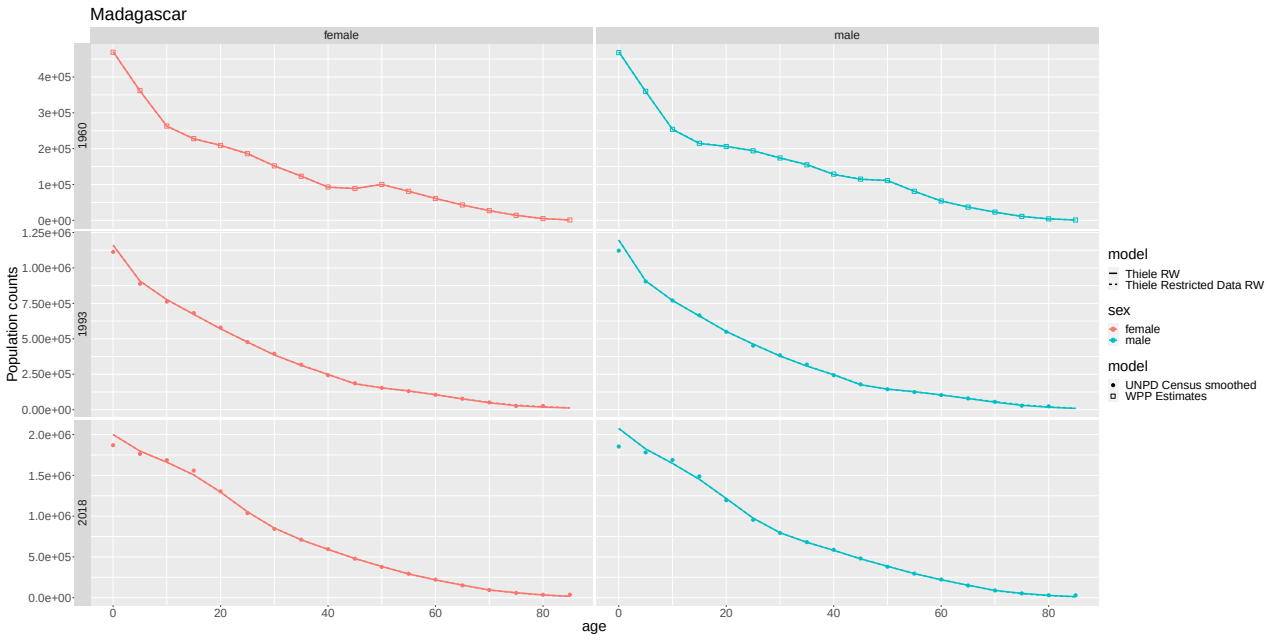

Figure 9: Population

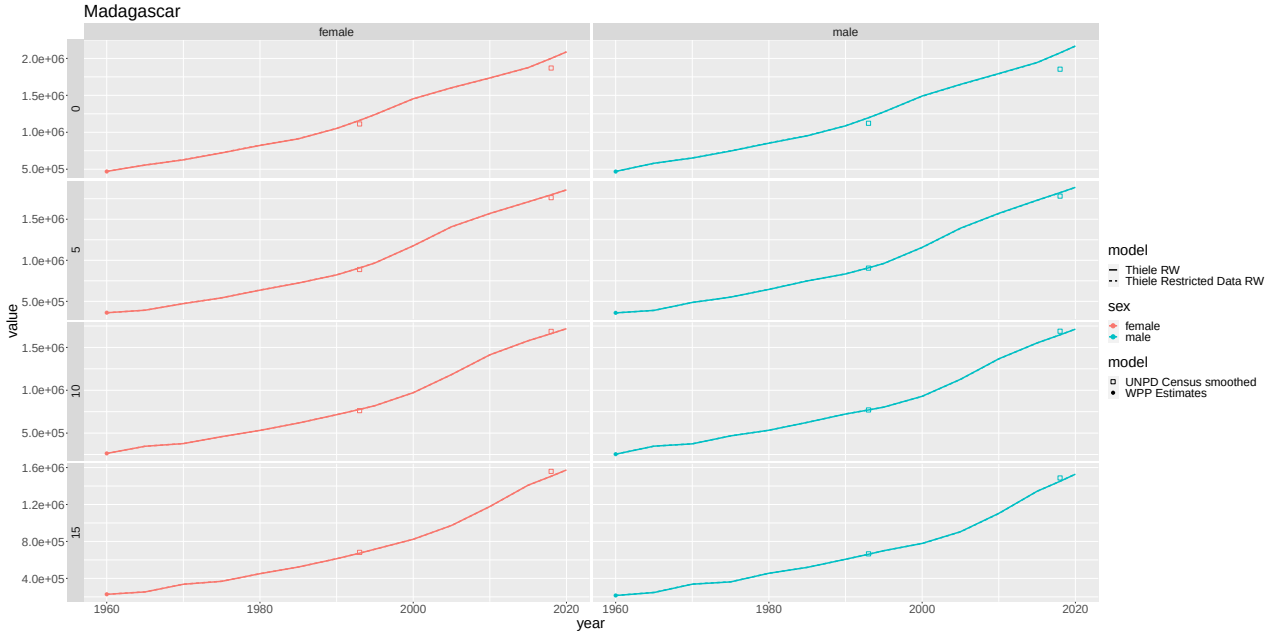

Figure 10: Population

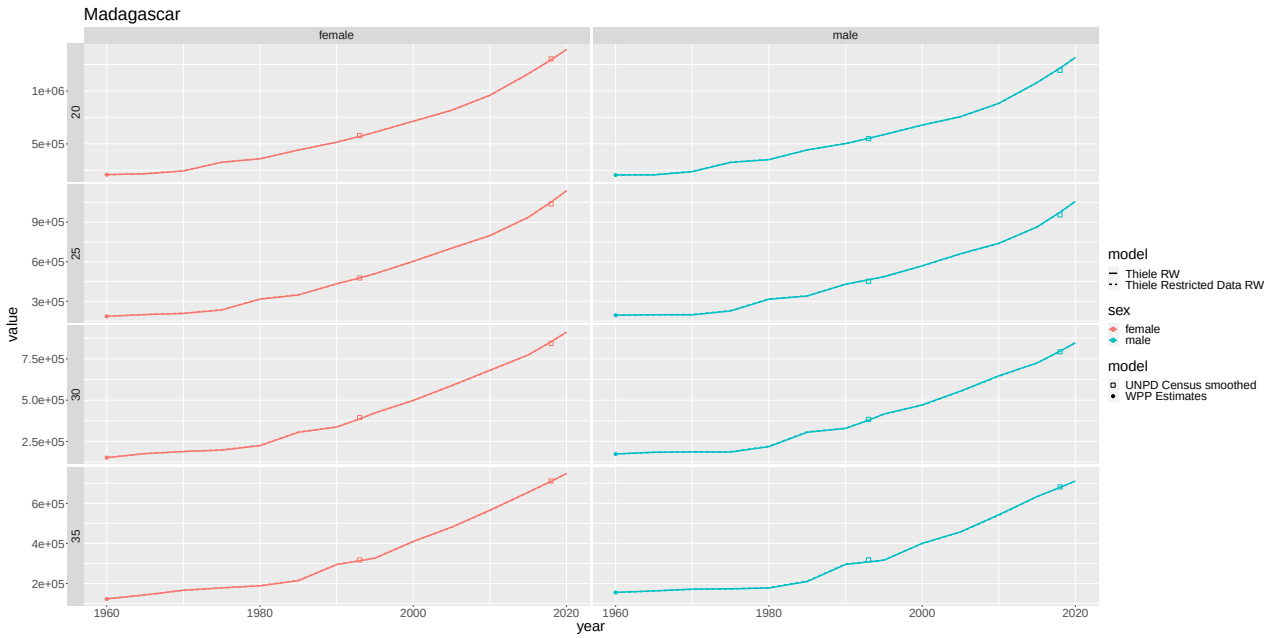

Figure 11: Population

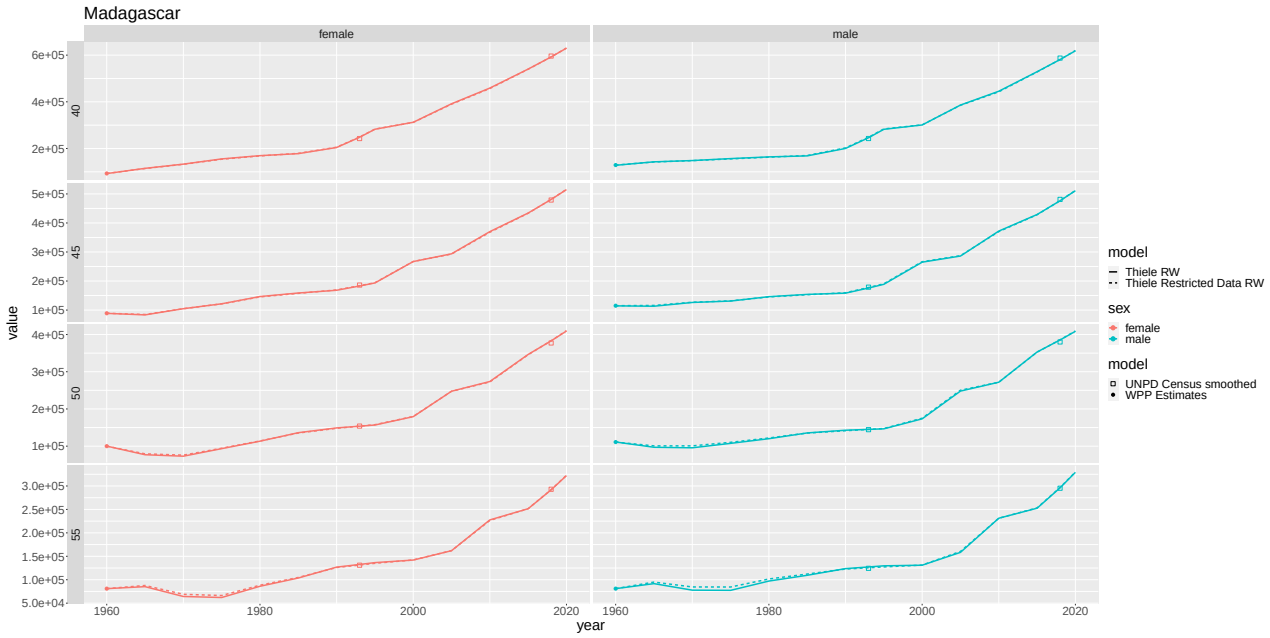

Figure 12: Population

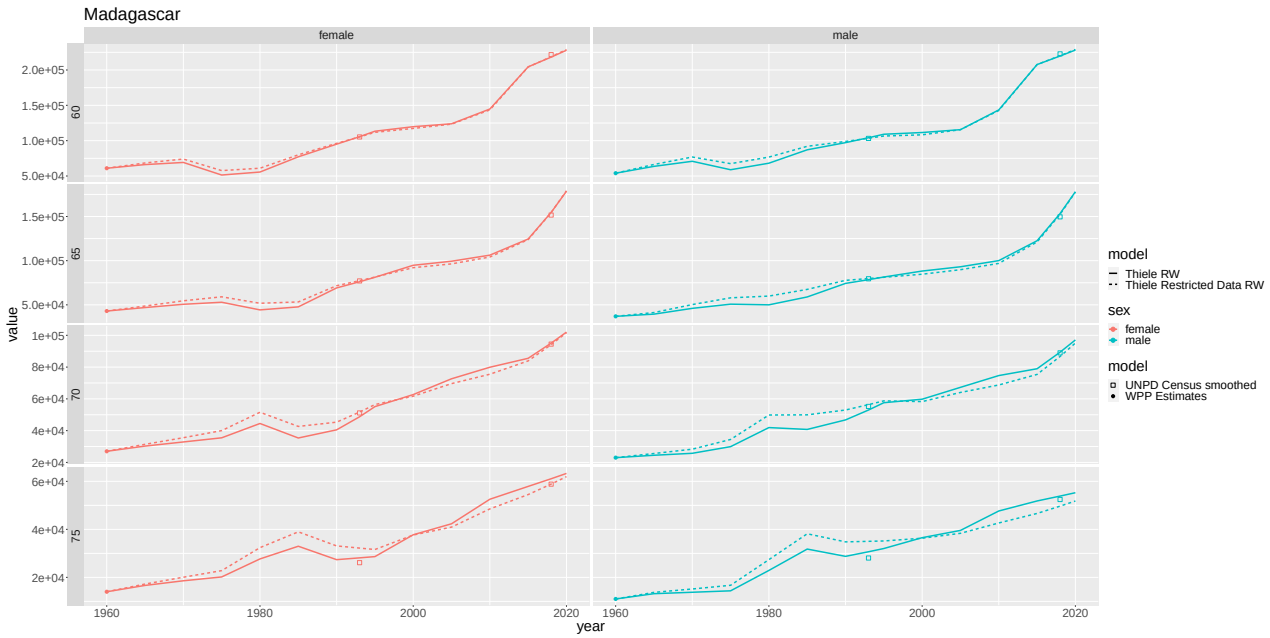

Figure 13: Population

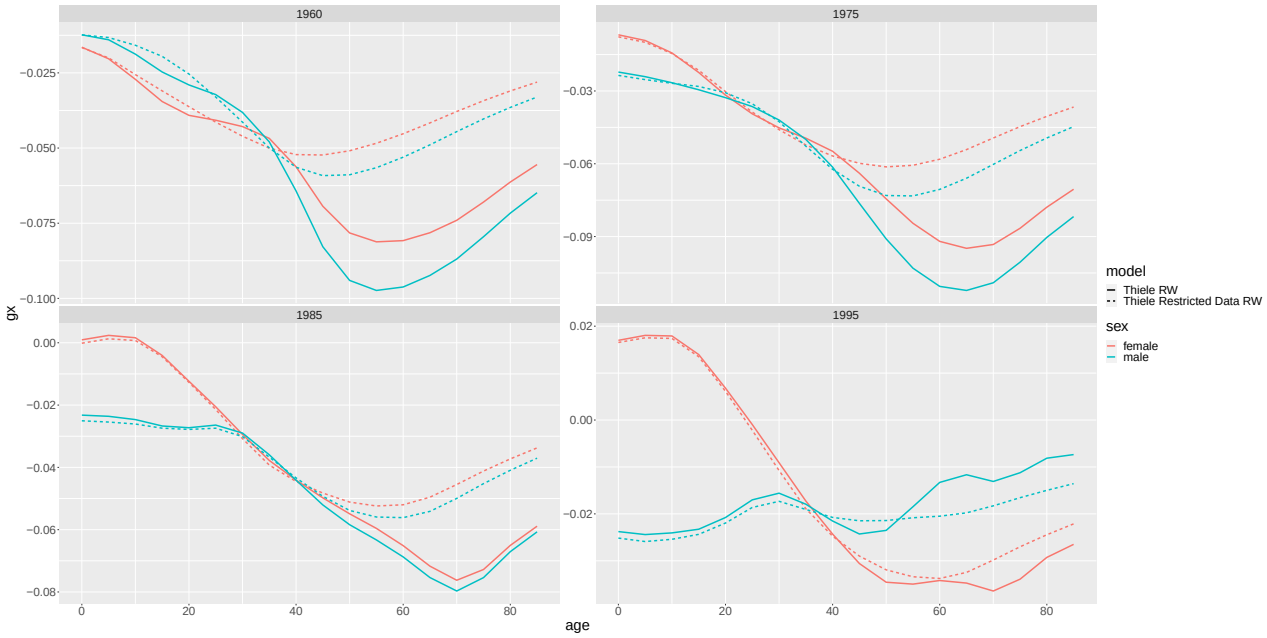

Figure 14: Migration

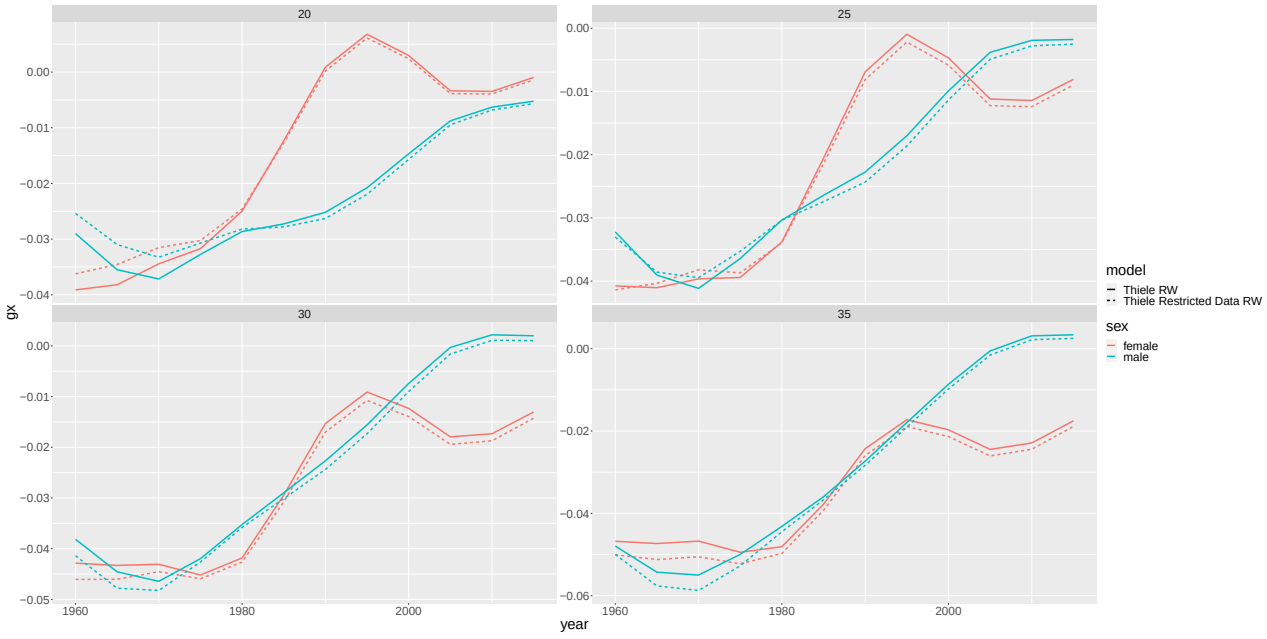

Figure 15: Migration

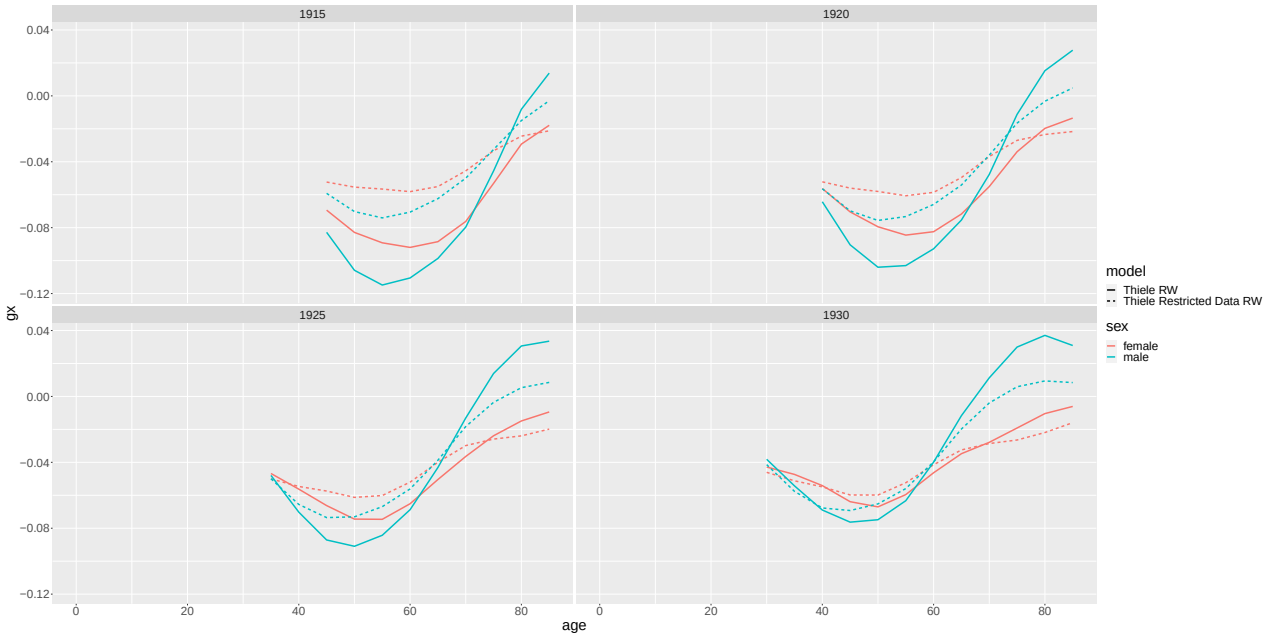

Figure 16: Migration

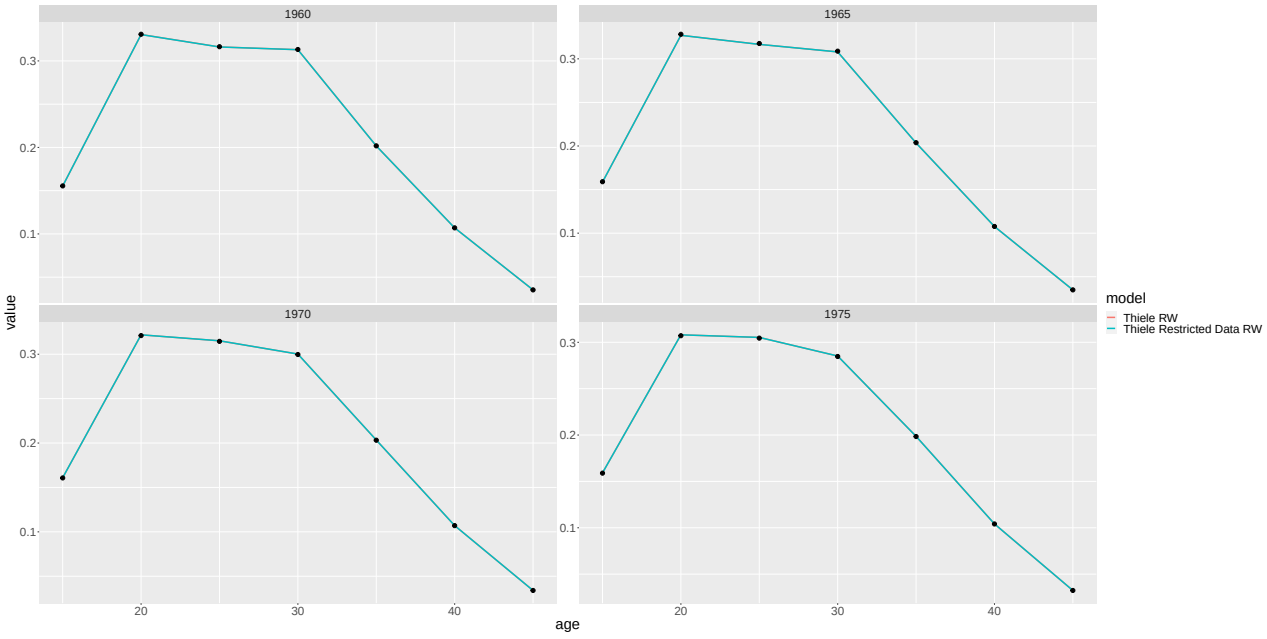

Figure 17: Fertility

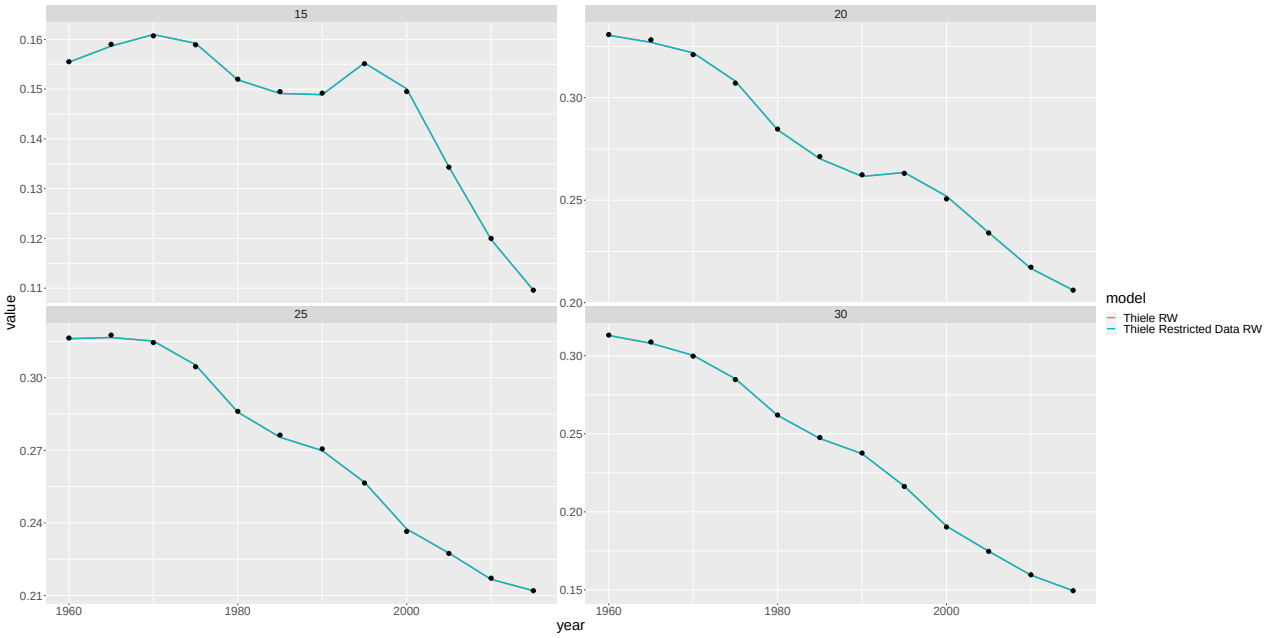

Figure 18: Fertility