

Tanzania

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

## # A tibble: 81 x 3
##   age `1988` `2012`
##   <dbl>   <dbl>   <dbl>
## 1     0 421414. 751563.
## 2     1 363583. 708100.
## 3     2 384979. 721738.
## 4     3 390569. 718712.
## 5     4 389974. 716843.
## 6     5 389580. 710960.
## 7     6 378466. 691003.
## 8     7 363961. 672103.
## 9     8 344911. 647733.
## 10    9 327565. 630221.
## # ... with 71 more rows

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

## # A tibble: 17 x 3
##   age `1978` `2002`
##   <dbl>   <dbl>   <dbl>
## 1     0 1620439. 2834362.
## 2     5 1369953. 2539282.
## 3    10 1089957. 2202643.
## 4    15  883300. 1906276.
## 5    20  766631. 1704896.
## 6    25  663604. 1468123.
## 7    30  539946. 1155183.
## 8    35  436695.  877869.
## 9    40  364001.  677439.
## 10   45  302415.  536720.
## 11   50  240309.  429372.
## 12   55  190693.  343468.
## 13   60  160488.  290374.
## 14   65  124638.  241783.
## 15   70   88231.  182349.
## 16   75   54700.  108149.
## 17   80   72469.  162567.

## [1] "Census Males"

## # A tibble: 81 x 3
##   age `1988` `2012`
##   <dbl>   <dbl>   <dbl>
## 1     0 416380. 747826.
## 2     1 360734. 710793.
## 3     2 379475. 722953.
## 4     3 385481. 722477.
## 5     4 384911. 721532.
## 6     5 384699. 714653.
## 7     6 374894. 692676.
```

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## 8      7 363557. 673655.
## 9      8 346283. 647036.
## 10     9 329693. 628063.
## # ... with 71 more rows

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

## # A tibble: 17 x 3
##   age   `1978`   `2002`
##   <dbl>   <dbl>   <dbl>
## 1     0 1557979. 2830545
## 2     5 1351767. 2552983
## 3    10 1091463. 2200531
## 4    15  833976. 1789534
## 5    20  656206. 1468786
## 6    25  566192. 1277250.
## 7    30  491229. 1077299.
## 8    35  414514.  851456
## 9    40  350720.  660490.
## 10   45  298970.  513774.
## 11   50  248216.  406410.
## 12   55  204132.  324059.
## 13   60  168723.  269689
## 14   65  131270.  223754.
## 15   70   99263.  171833
## 16   75   66150.  113205
## 17   80   88783.  145641
```

Thiele log-Normal Hump Spline

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

##   log_tau2_logpop   log_tau2_logpop   log_tau2_logpop   log_tau2_logpop   log_lambda_fx   log_
##   3.151330e+00      2.078915e+00      3.151330e+00      2.078915e+00      4.484066e+00      8.
##   log_lambda_tp      tp_slope      tp_params_5      tp_params_10   log_lambda_phi   log_
##   5.000000e+00      -1.860814e-12      3.000000e-01      3.000000e-01      8.356928e+00      8.
## log_lambda_lambda   log_lambda_delta log_lambda_epsilon
##   4.764865e+00      5.685987e+00      4.764865e+00
```

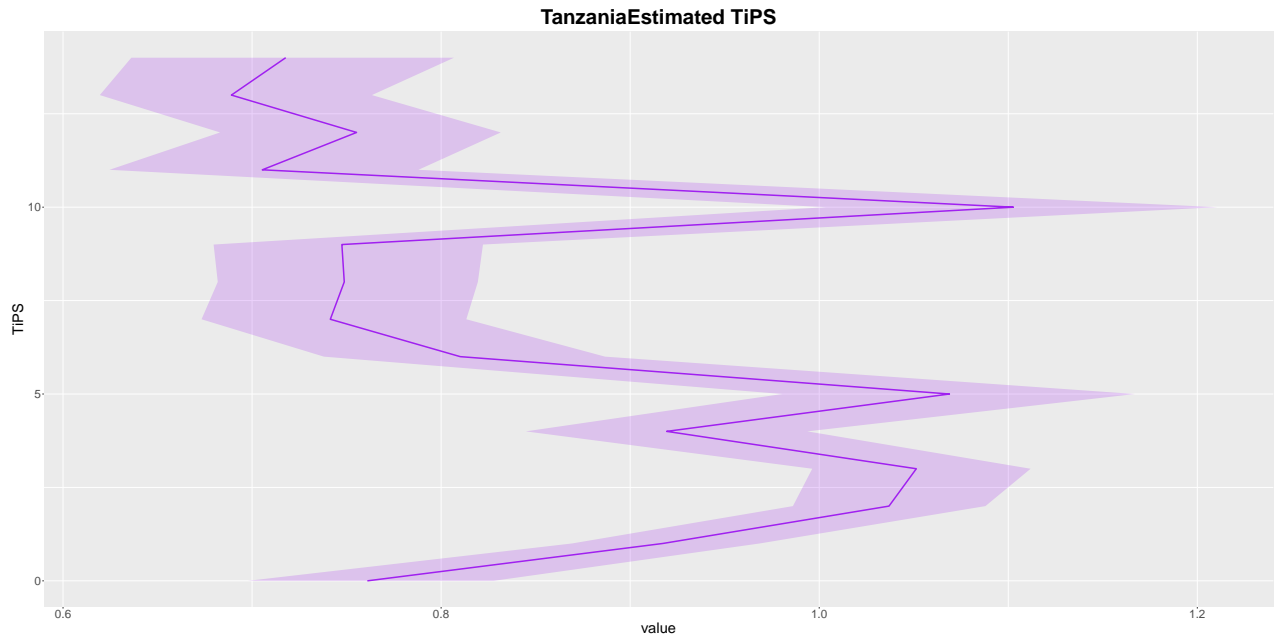


Figure 1: Estimated TiPS

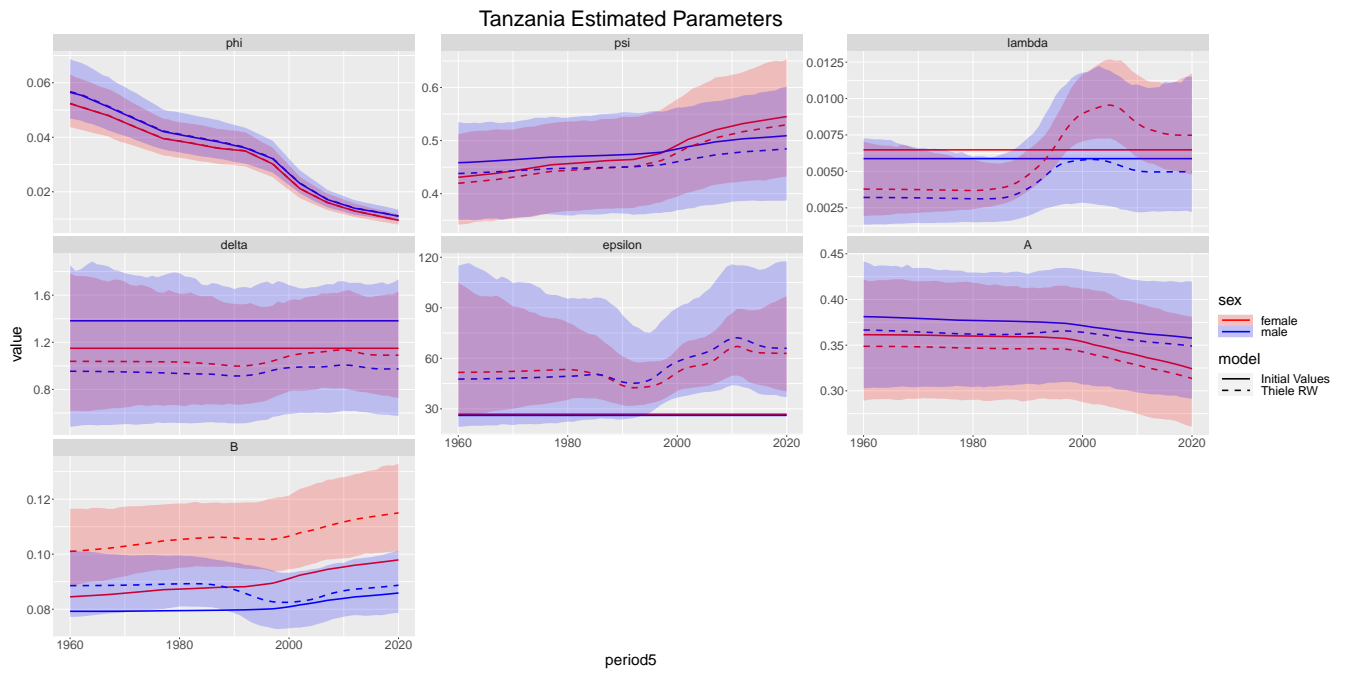


Figure 2: Estimated parameters

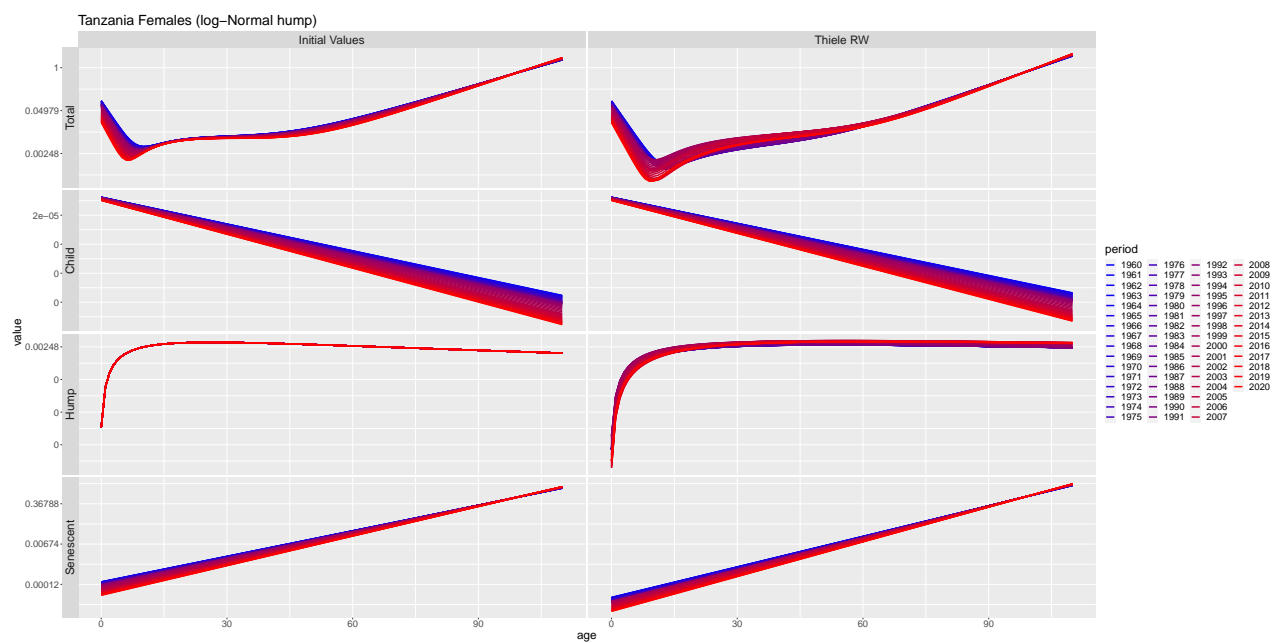


Figure 3: Thiele Decomposed

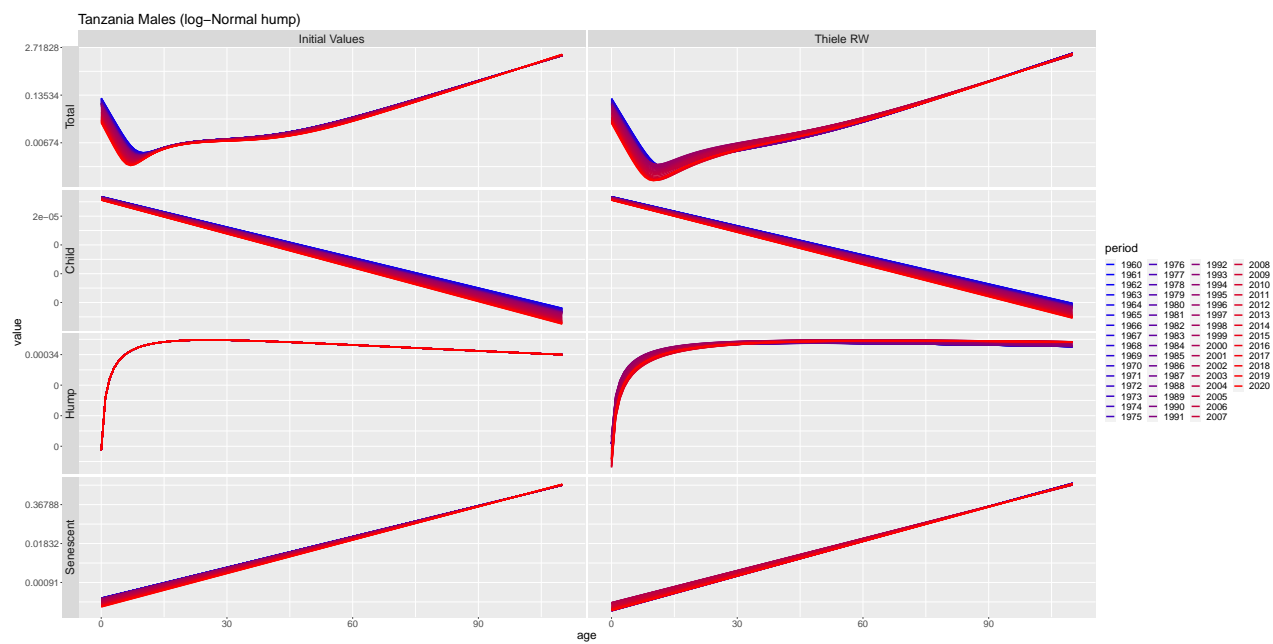


Figure 4: Thiele Decomposed

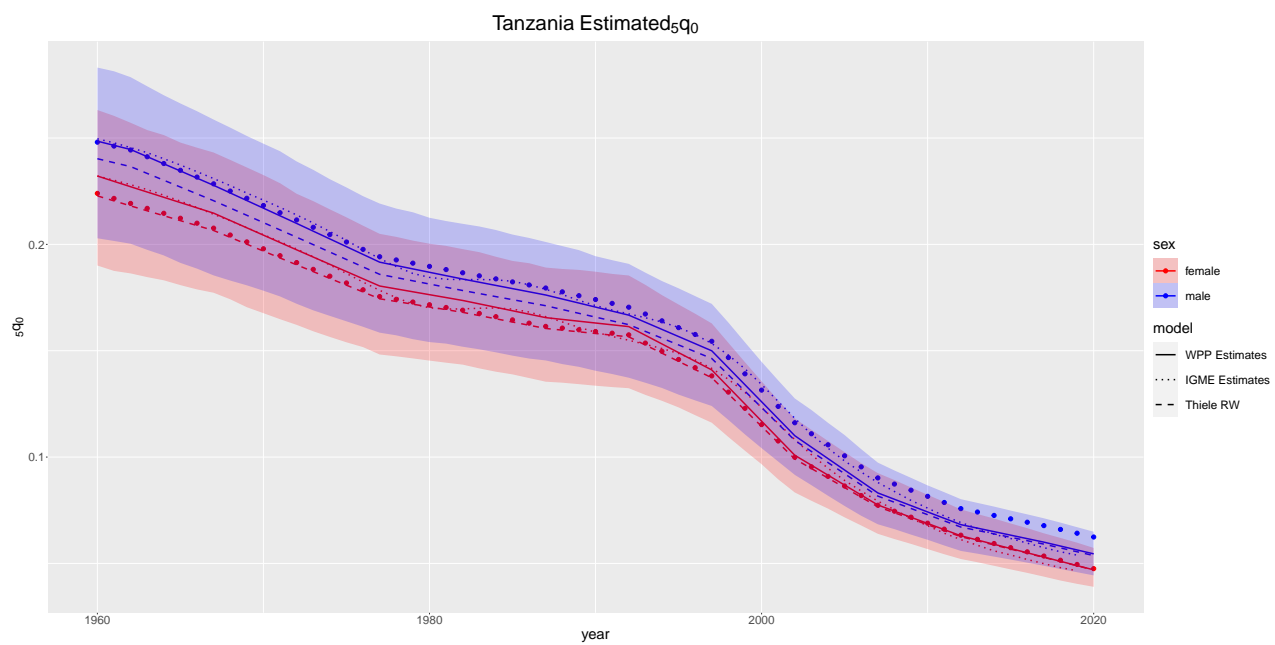


Figure 5: Estimated ${}_5q_0$

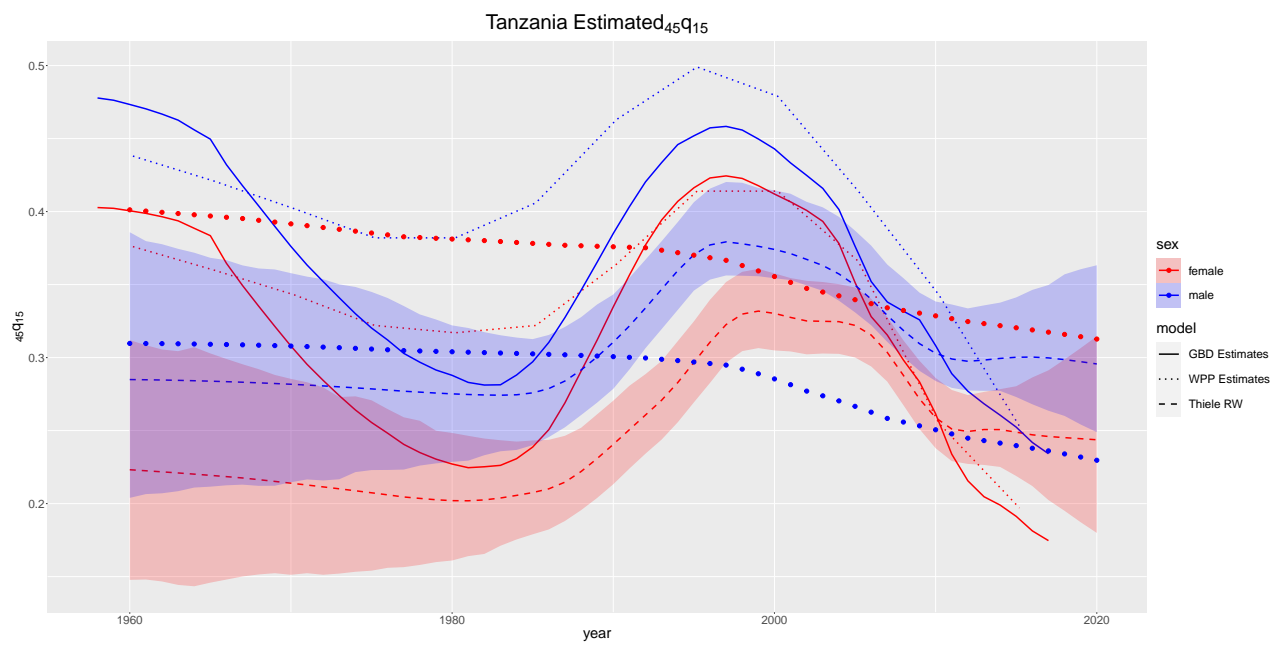


Figure 6: Estimated ${}_{45}q_{15}$

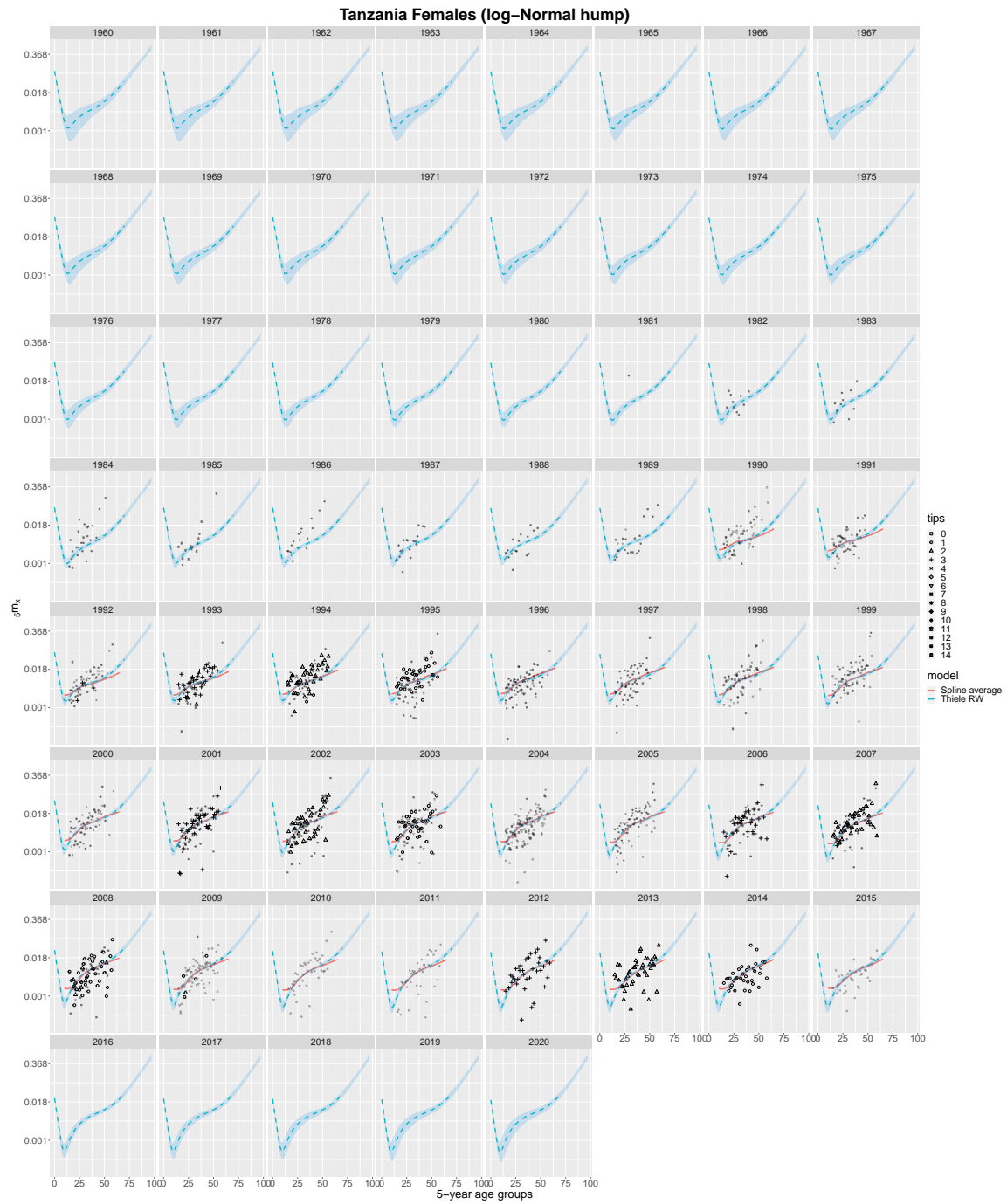


Figure 7: Mortality Schedules

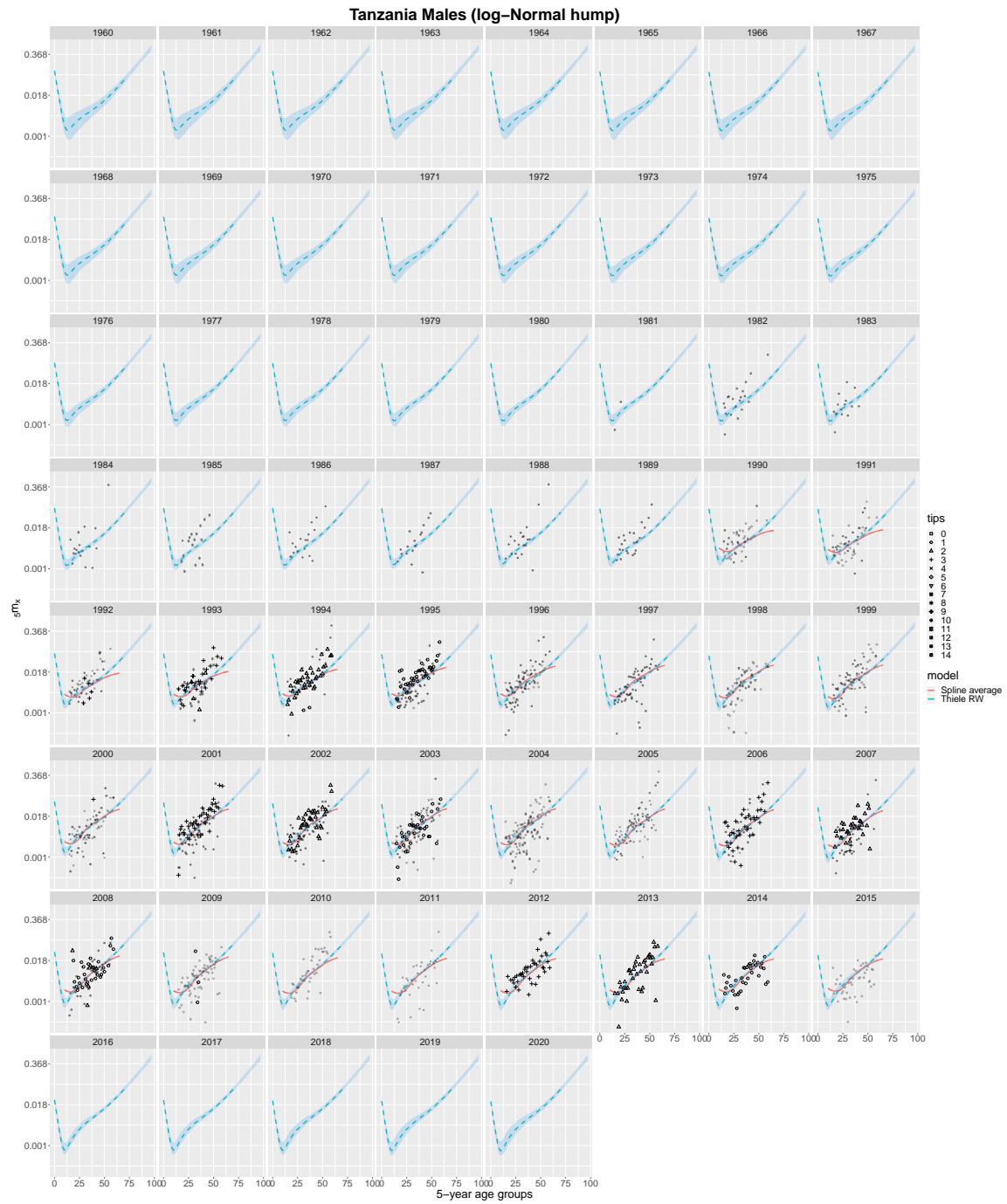


Figure 8: Mortality Schedules

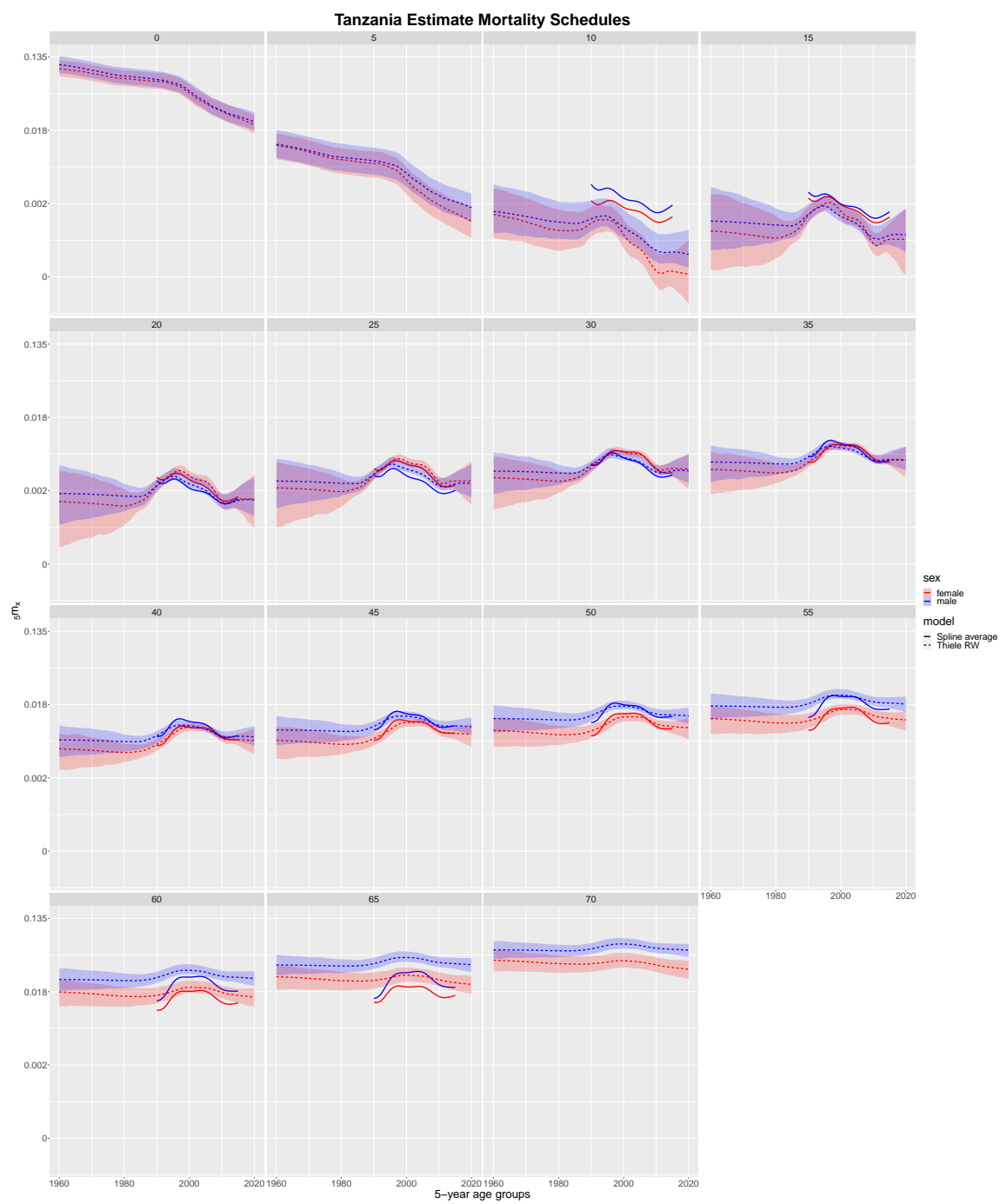


Figure 9: Mortality Schedules

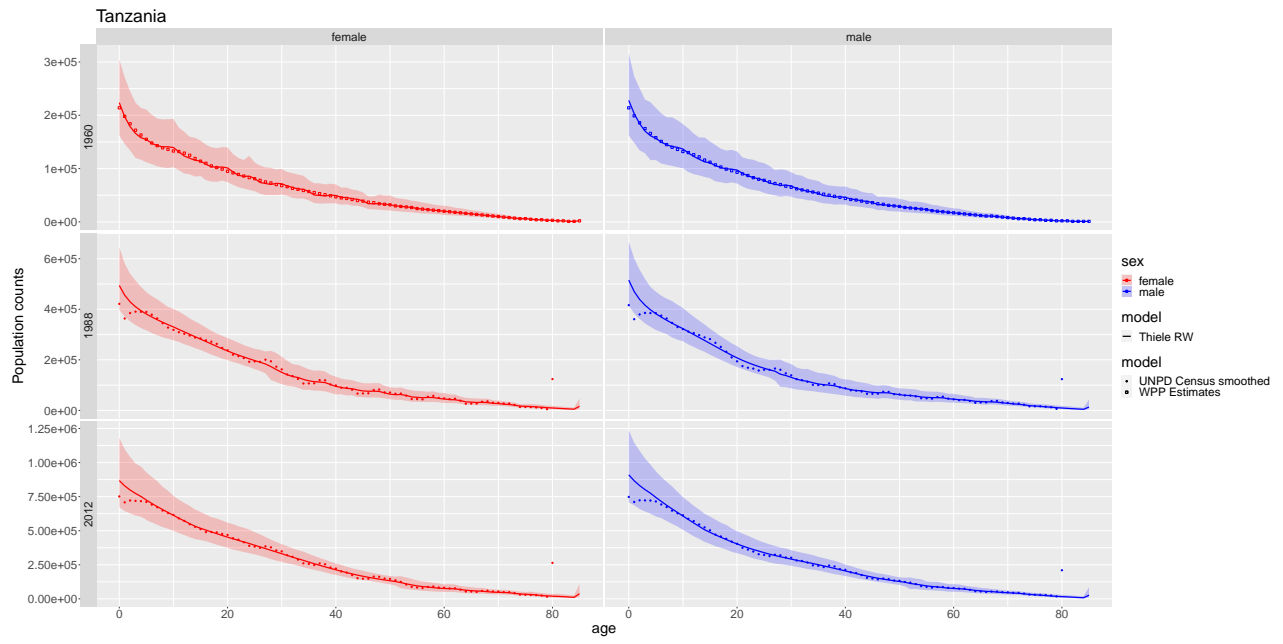


Figure 10: Population

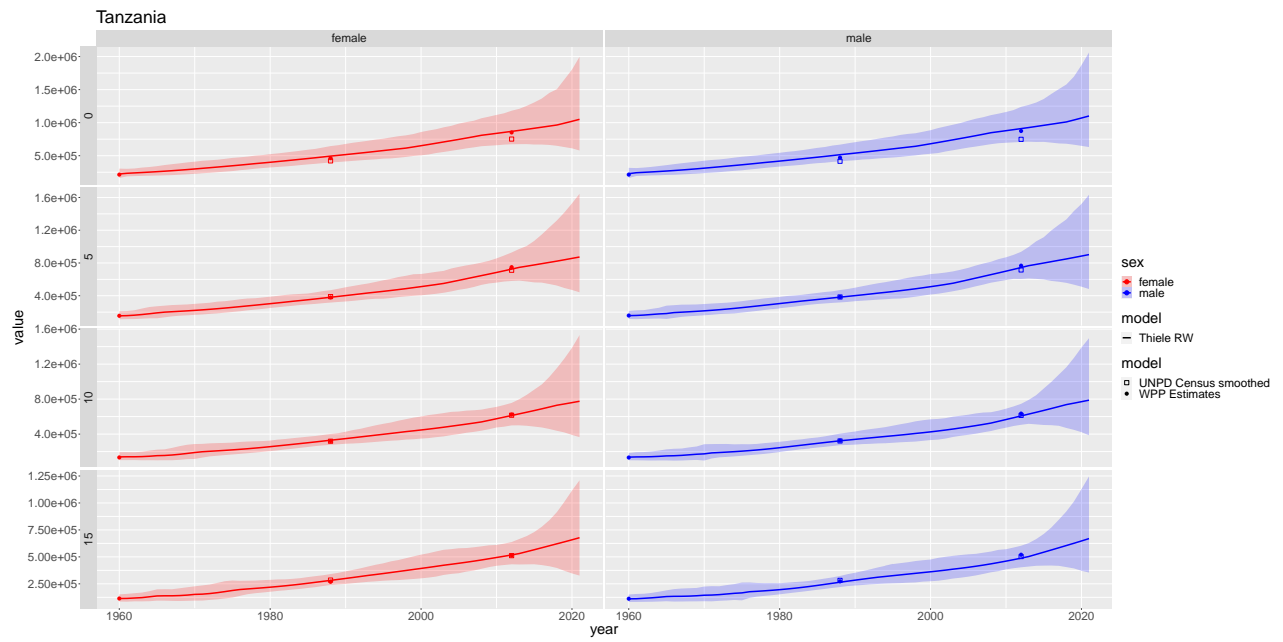


Figure 11: Population

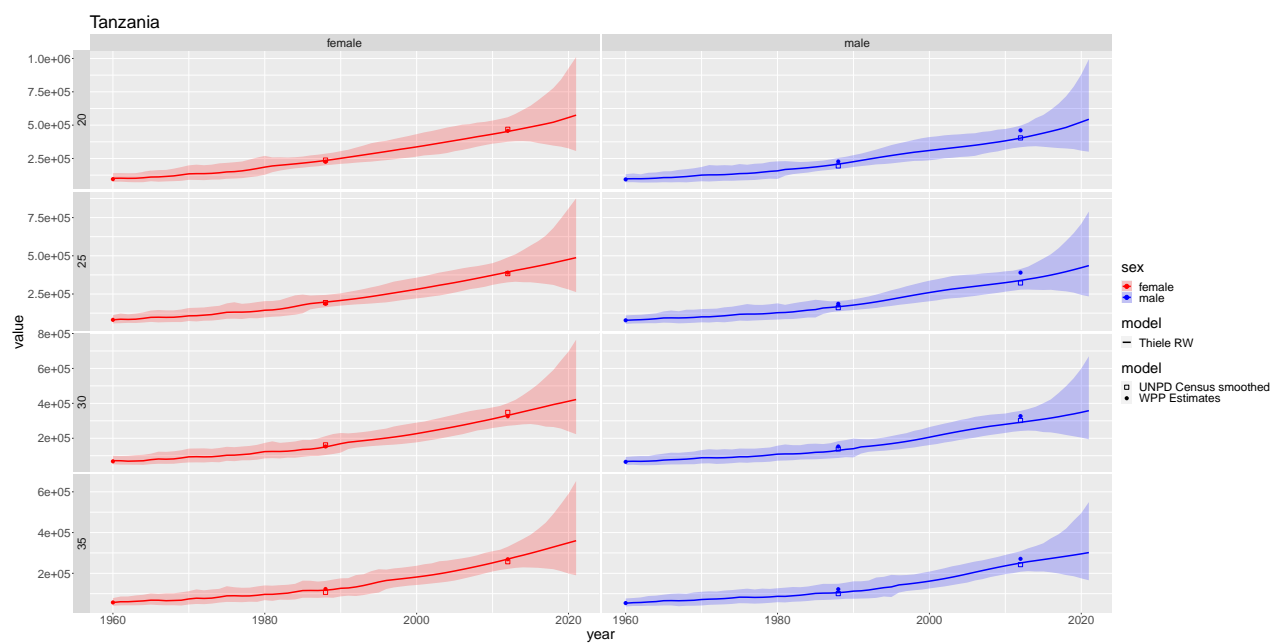


Figure 12: Population

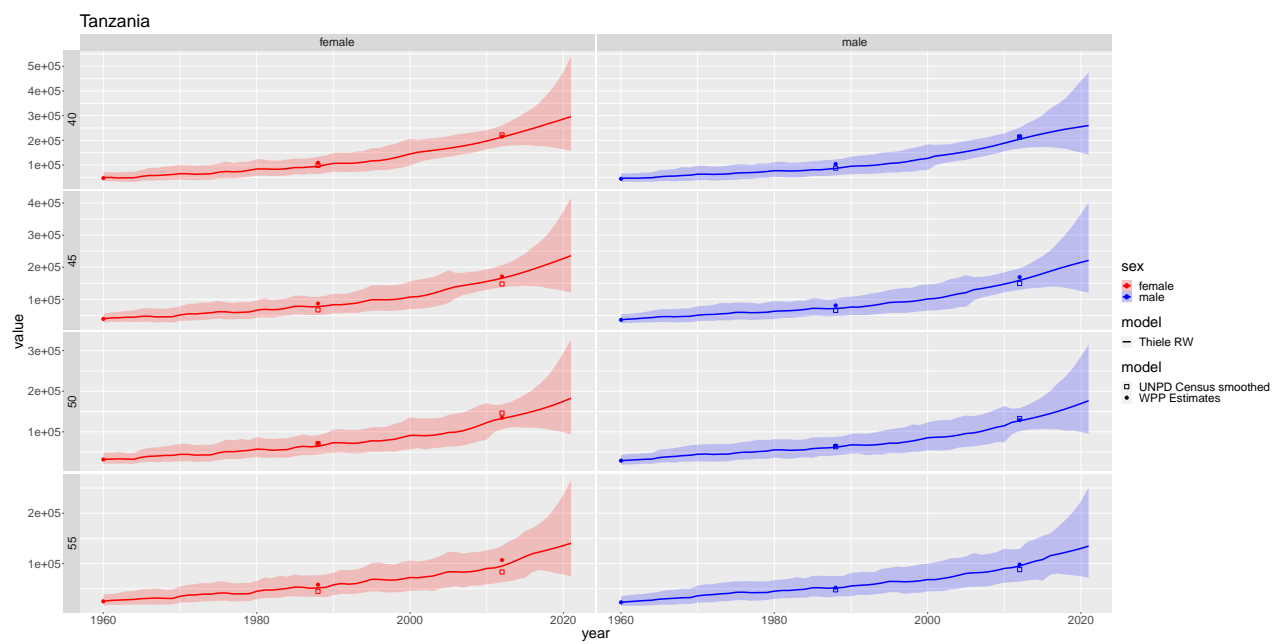


Figure 13: Population

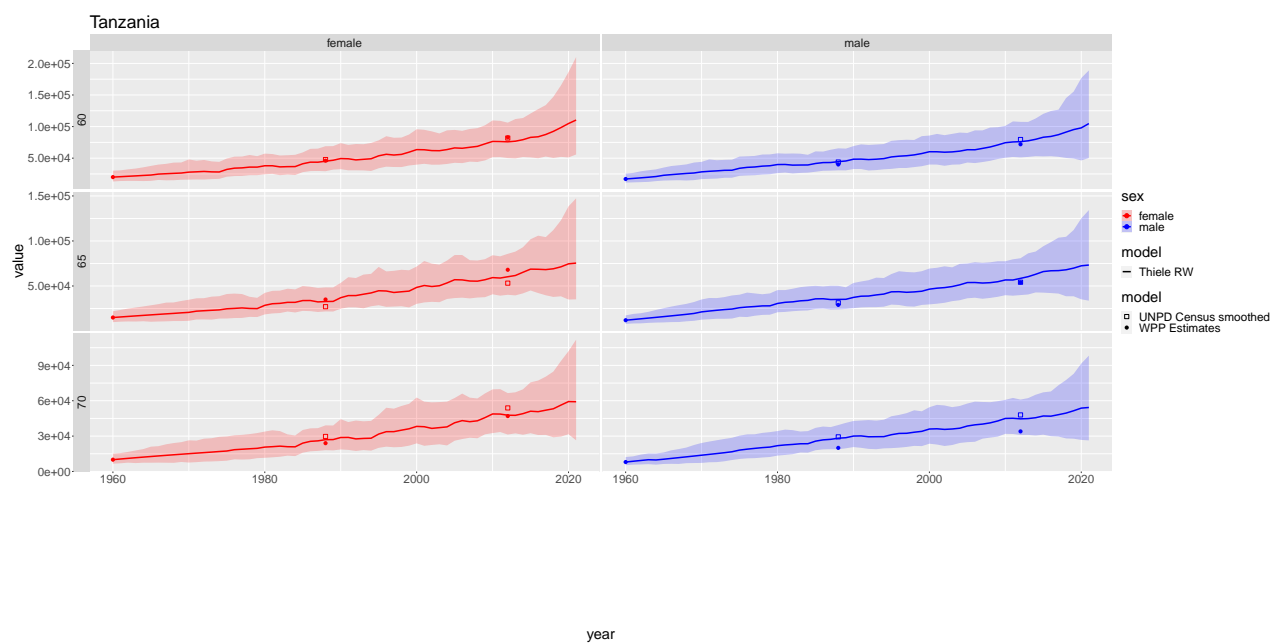


Figure 14: Population

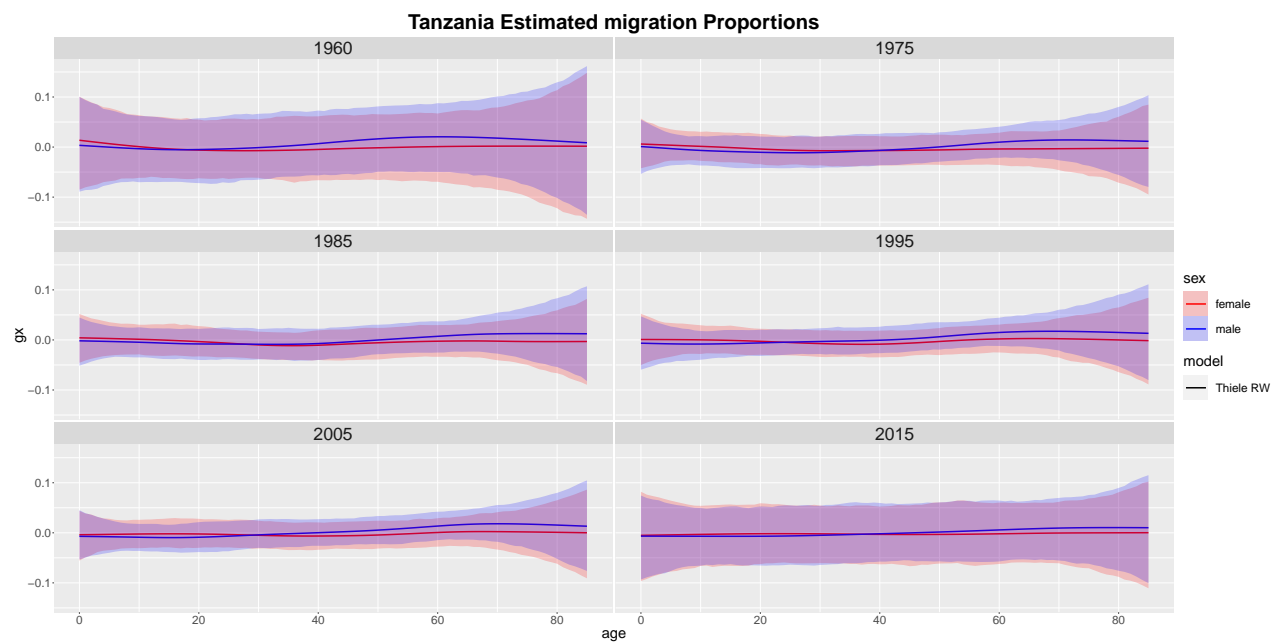


Figure 15: Migration

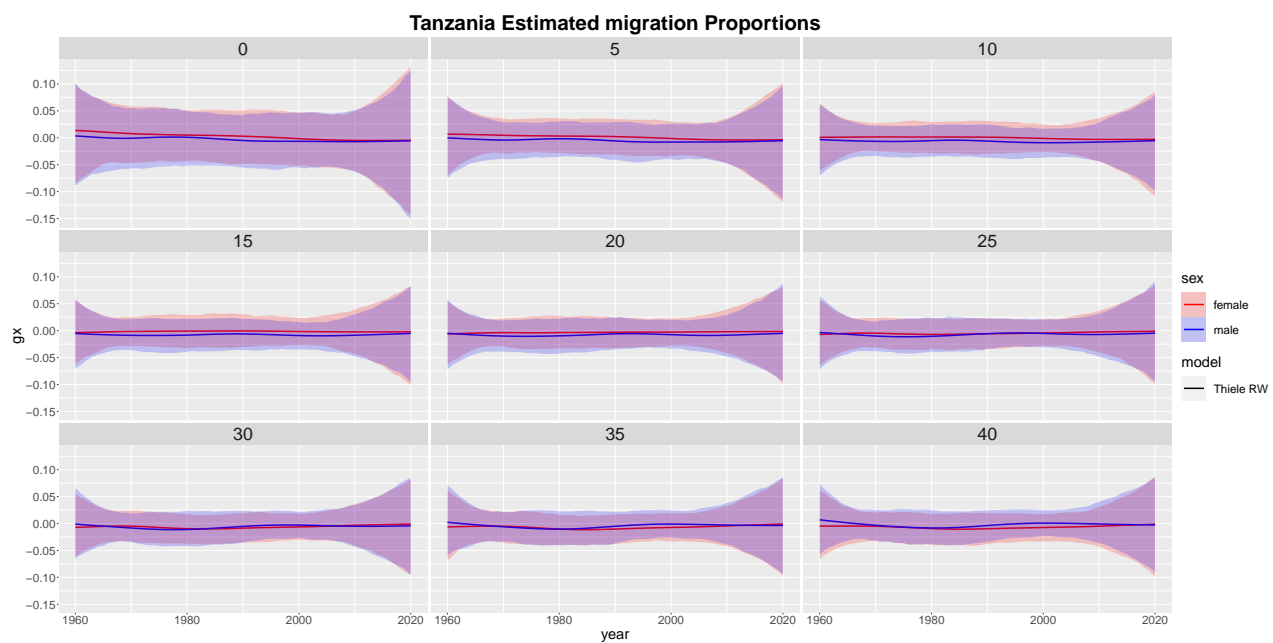


Figure 16: Migration

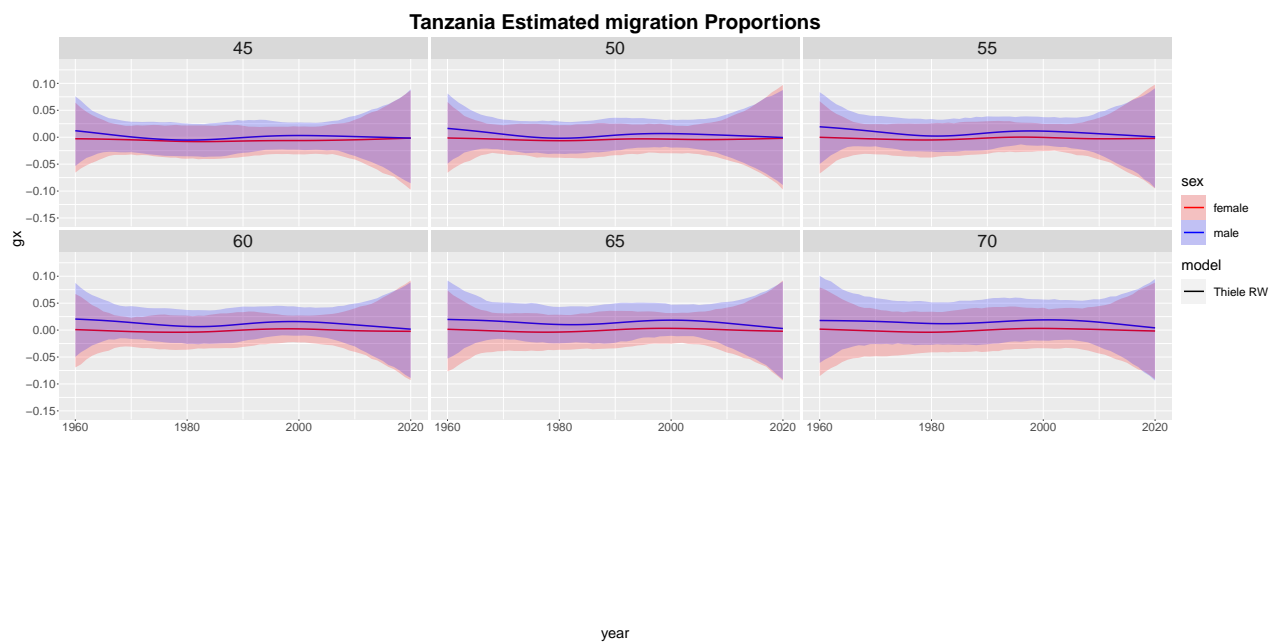


Figure 17: Migration

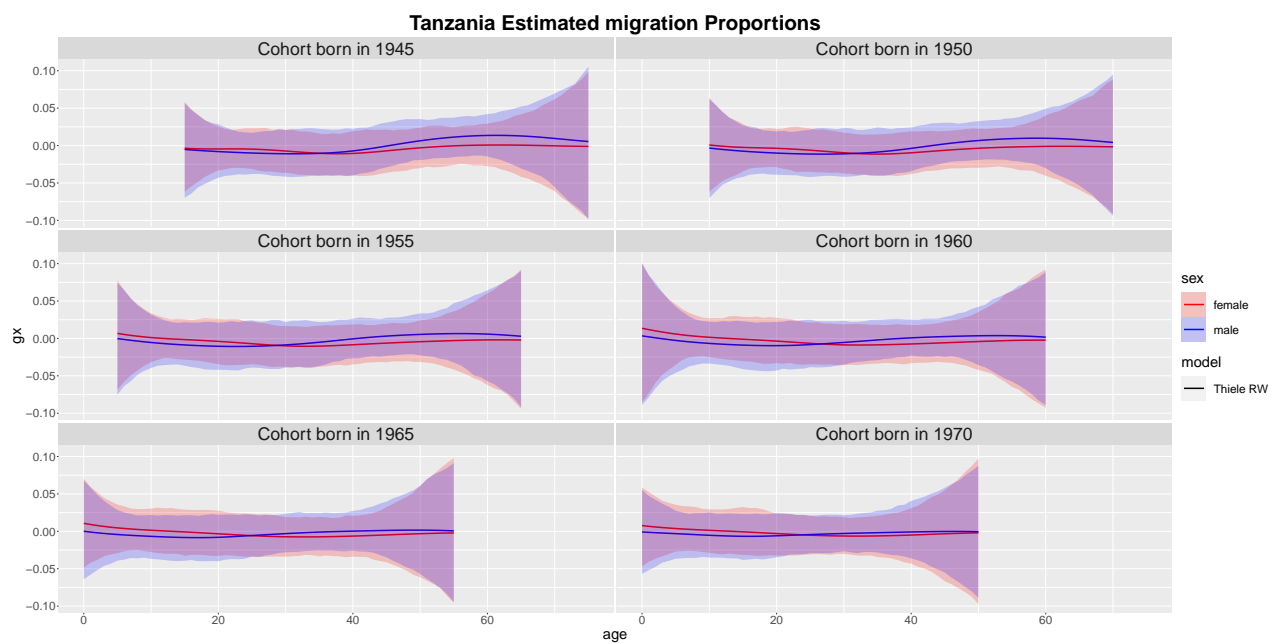


Figure 18: Migration

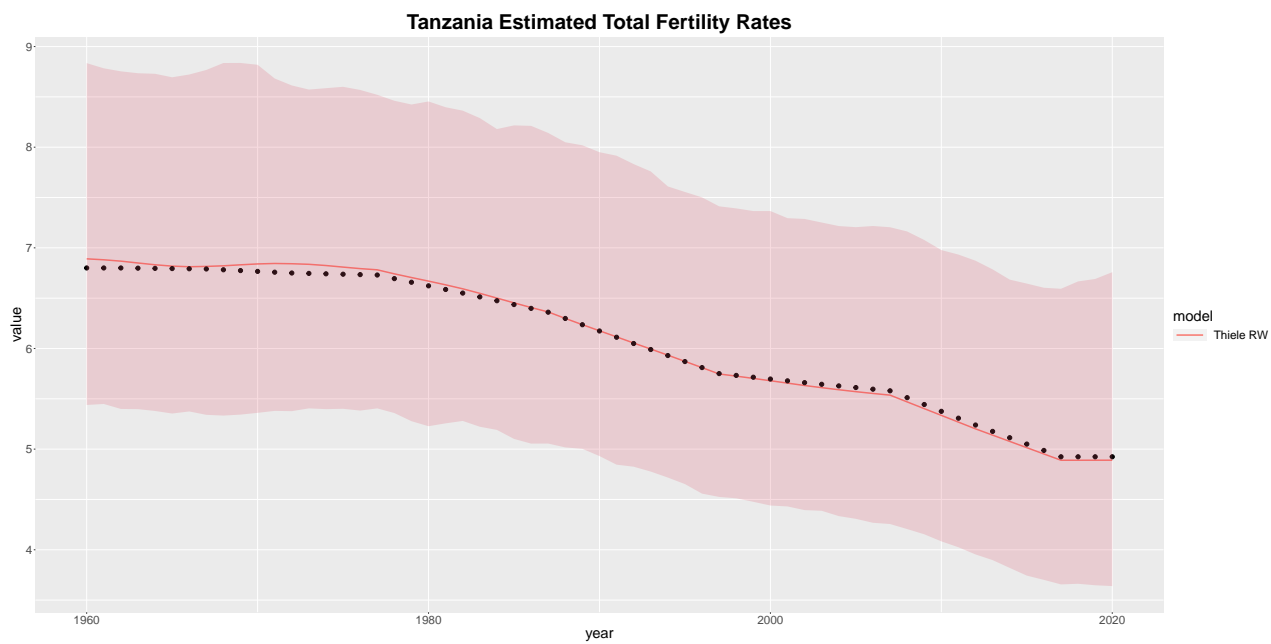


Figure 19: Total Fertility

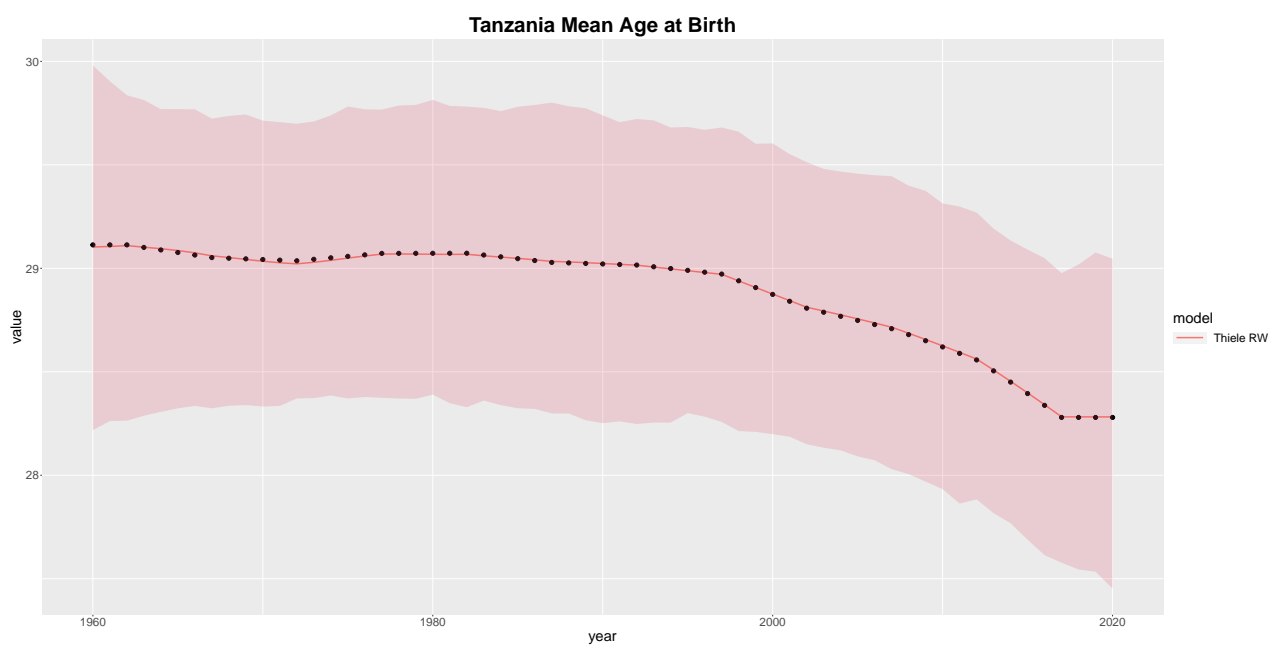


Figure 20: Mean age at births

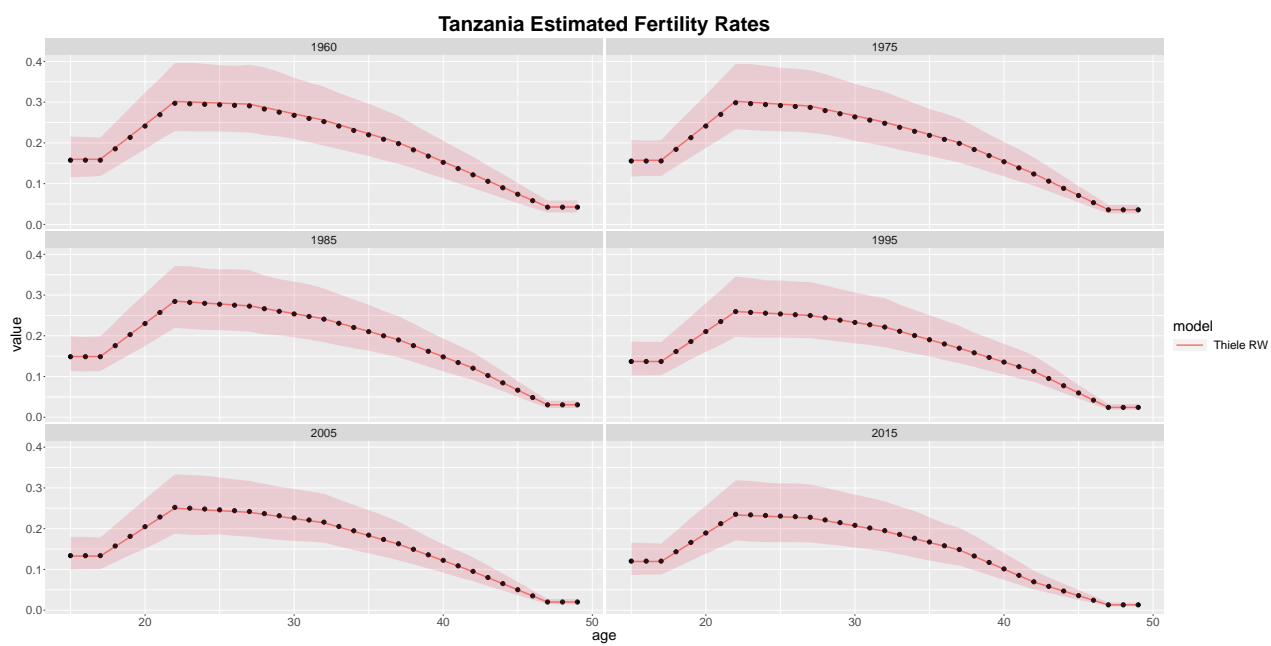


Figure 21: Fertility

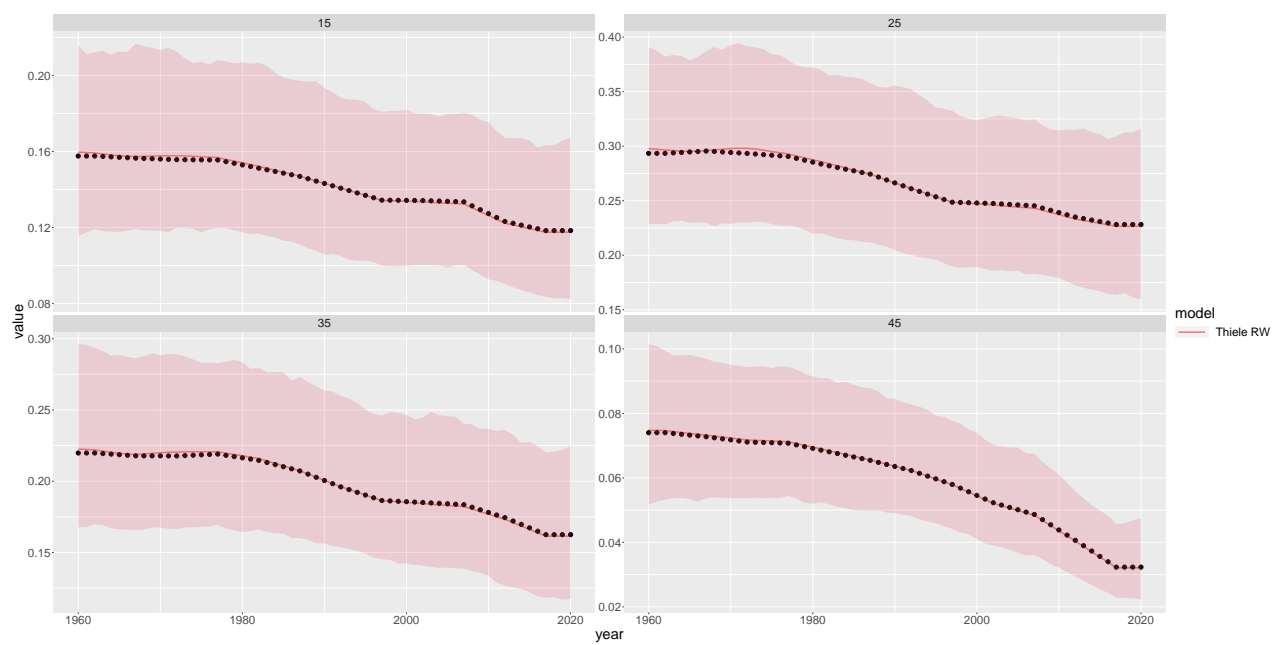


Figure 22: Fertility