Togo

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

## # A tibble: 86 x 2
##      age `1970`
##    <dbl>  <dbl>
## 1      0 40430.
## 2      1 37238.
## 3      2 41304.
## 4      3 41179.
## 5      4 41431.
## 6      5 40995.
## 7      6 38433.
## 8      7 35076.
## 9      8 31456.
## 10     9 27541.
## # ... with 76 more rows

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

## # A tibble: 18 x 3
##      age  `1981`  `2010`
##    <dbl>   <dbl>   <dbl>
## 1      0 270991. 445753.
## 2      5 223881. 436083.
## 3     10 164223. 370046.
## 4     15 130977. 309693.
## 5     20 122493. 290666.
## 6     25 111348. 270917.
## 7     30  90044. 229765.
## 8     35  68593. 187312.
## 9     40  53165. 151703.
## 10    45  41694. 120178.
## 11    50  30908.  92157.
## 12    55  22256.  69045.
## 13    60  18221.  54414.
## 14    65  14719.  43884.
## 15    70  10947.  33878.
## 16    75   6866.  20370.
## 17    80  18818.  45734.
## 18    85     NA      NA

## [1] "Census Males"

## # A tibble: 86 x 2
##      age `1970`
##    <dbl>  <dbl>
## 1      0 39209.
## 2      1 36913.
## 3      2 41089.
## 4      3 41287.
## 5      4 42040.
## 6      5 42119.
```

```
##  7      6 40150.
##  8      7 37523.
##  9      8 34499.
## 10      9 31051.
## # ... with 76 more rows

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

## # A tibble: 18 x 3
##      age `1981` `2010`
##    <dbl>  <dbl>  <dbl>
##  1     0 273552. 457477.
##  2     5 240827. 453946.
##  3    10 184640. 395001.
##  4    15 132551. 318112.
##  5    20  96868. 258958.
##  6    25  76324. 220972.
##  7    30  62959. 195558.
##  8    35  51668. 168457.
##  9    40  44478. 139836.
## 10    45  38728. 112004.
## 11    50  30174.  83440.
## 12    55  22170.  59442.
## 13    60  18389.  42713.
## 14    65  15110.  30553.
## 15    70  11486.  22097.
## 16    75   7179.  13278.
## 17    80  20772.  28018.
## 18    85     NA      NA
```

Thiele log-Normal Hump Spline

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

```
##      log_tau2_logpop       log_tau2_logpop       log_tau2_logpop       log_tau2_logpop           log
##           4.58703092            4.77790526            4.33530091            4.26877754
##      log_dispersion        log_dispersion        log_lambda_tp            tp_slope
##           0.74737251            0.61678355            2.94807505           -0.07413152
##      log_lambda_phi        log_lambda_psi         log_lambda_A          log_lambda_B       log_lar
##          11.29113917           11.30989147           11.19203745            7.31001090
##   log_lambda_epsilon
##           4.19069002
```
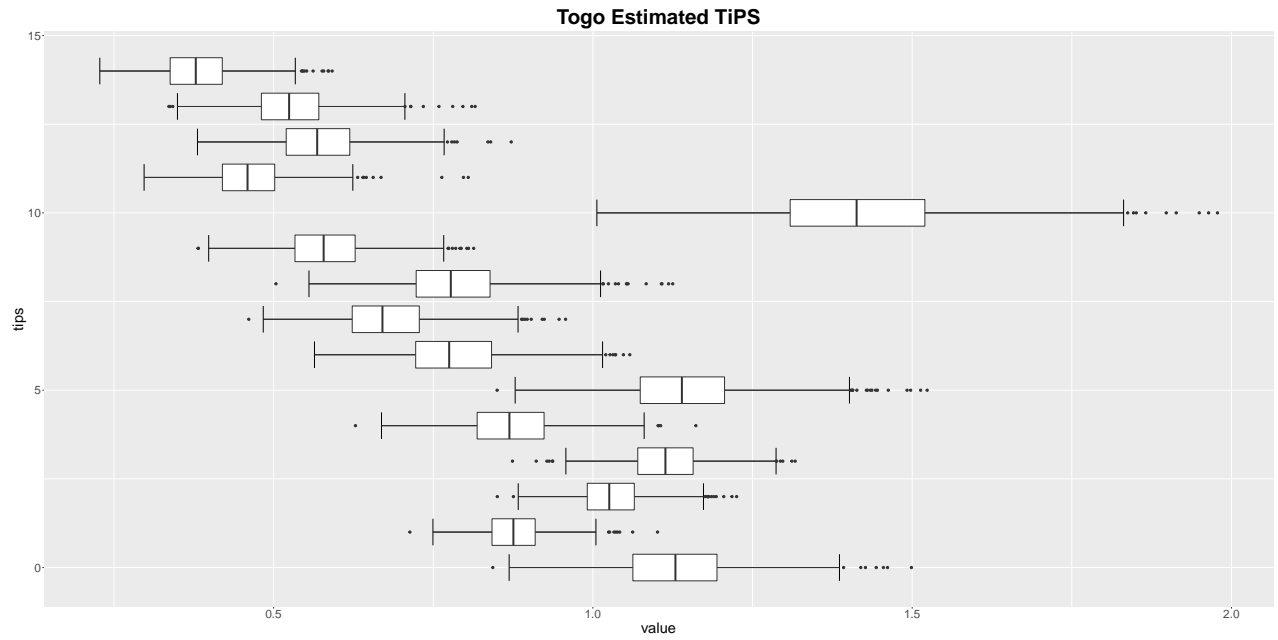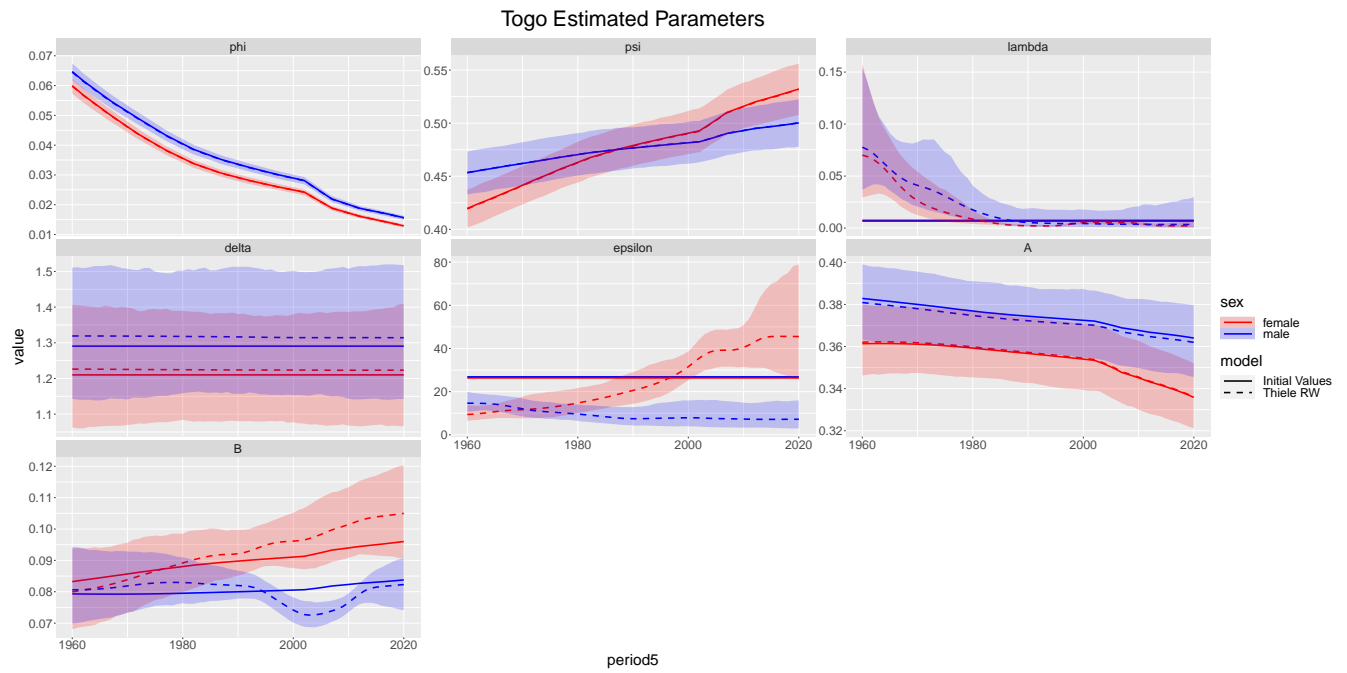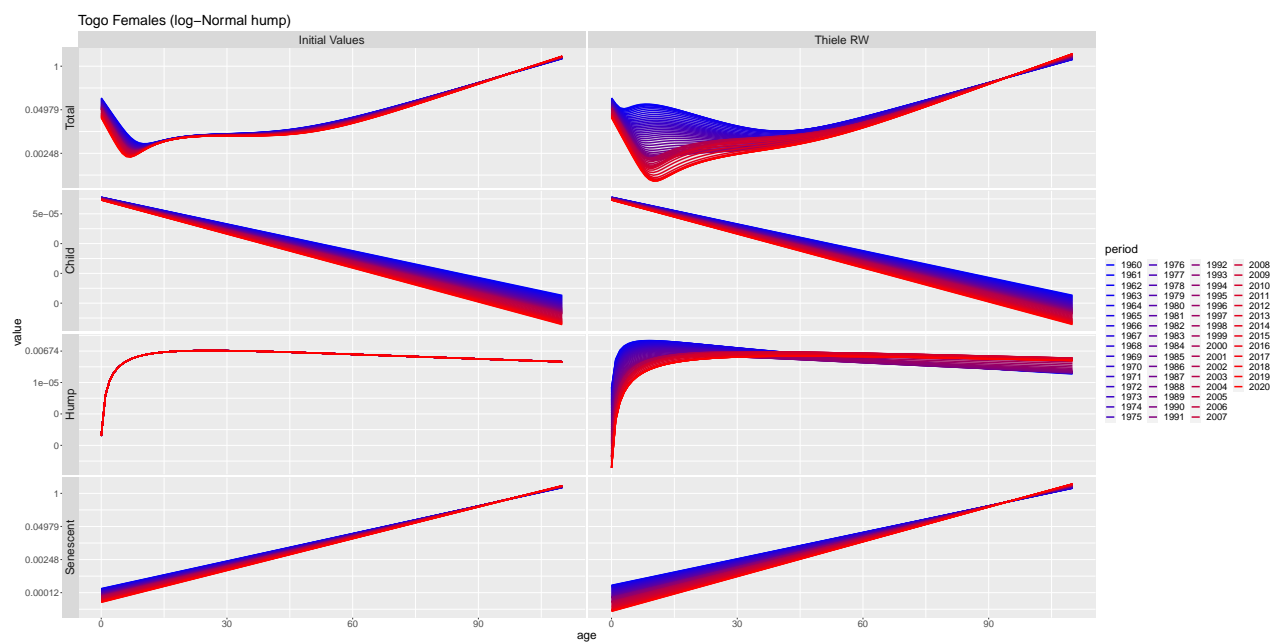
Figure 1: Estimated TiPS

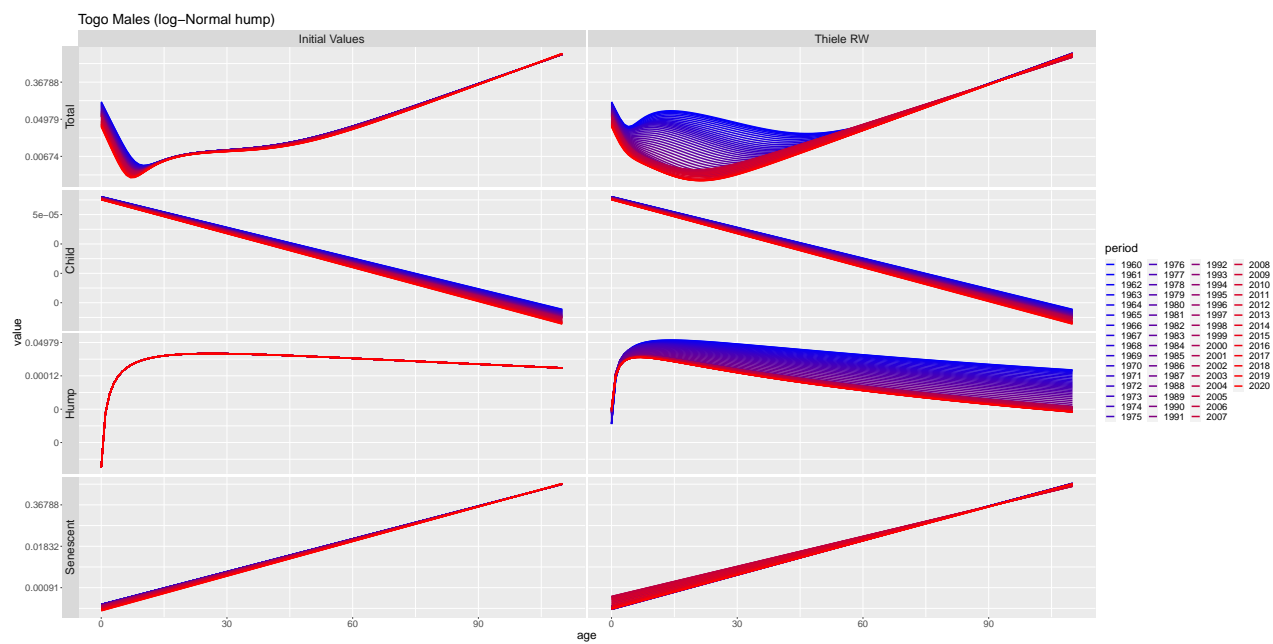Figure 2: Estimated parameters

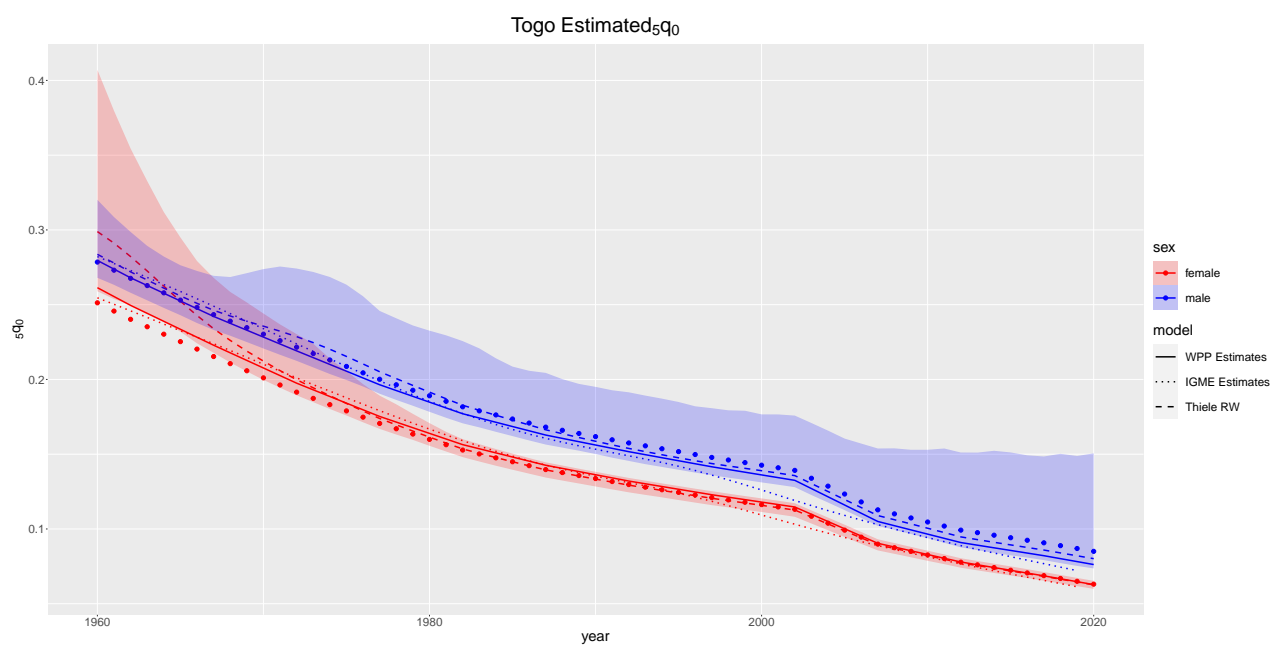Figure 3: Thiele Decomposed

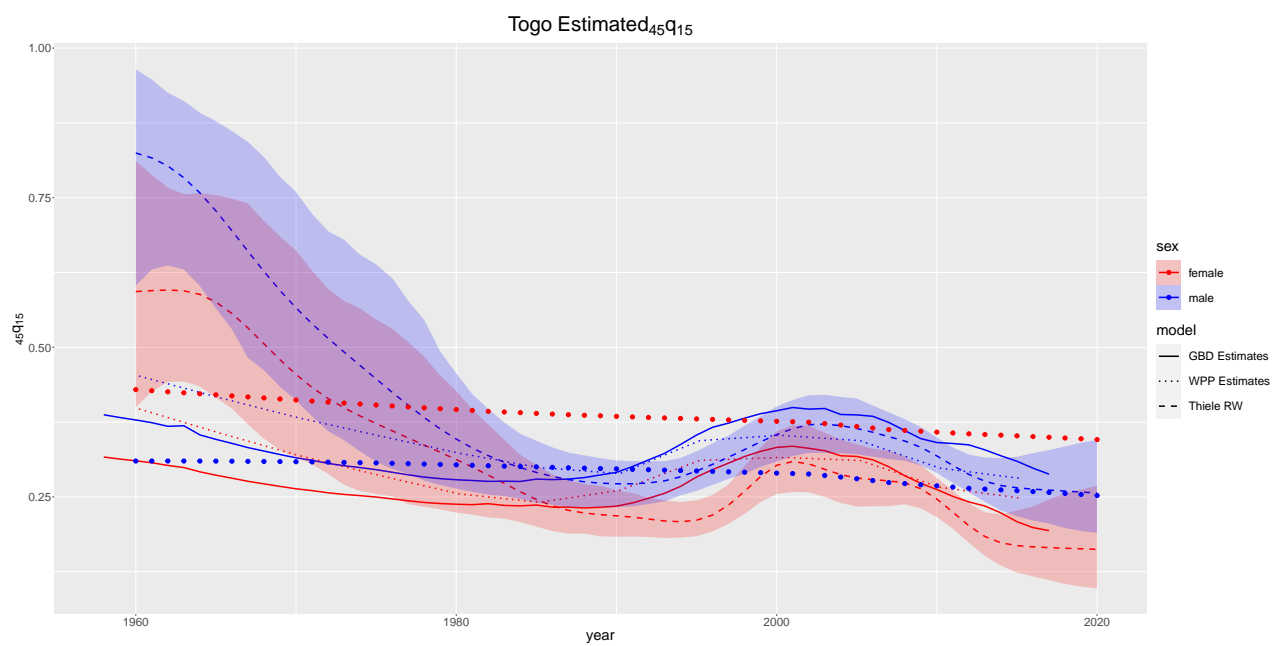Figure 4: Thiele Decomposed

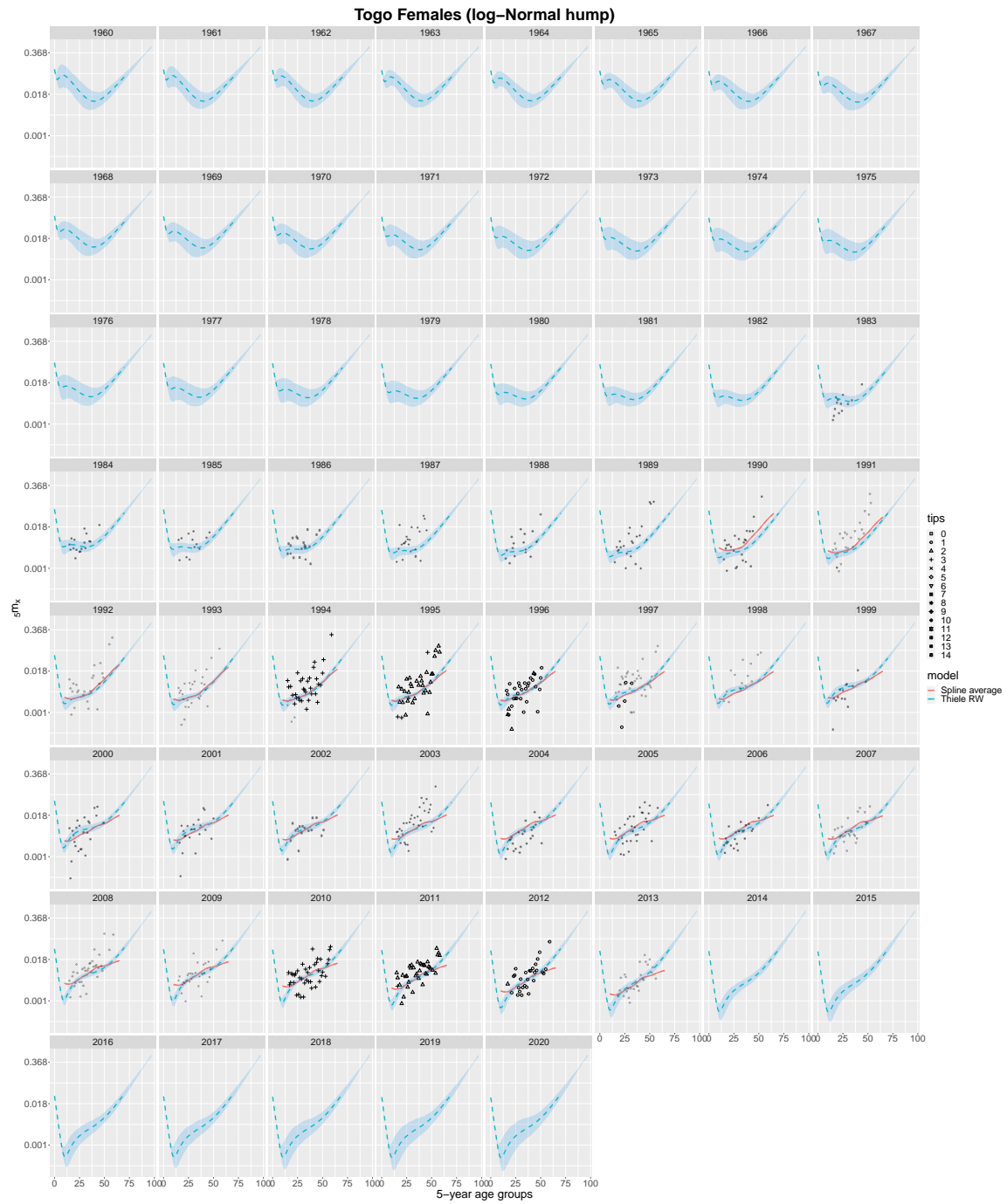Figure 5: Estimated $_5q_0$

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

Figure 7: Mortality Schedules

6
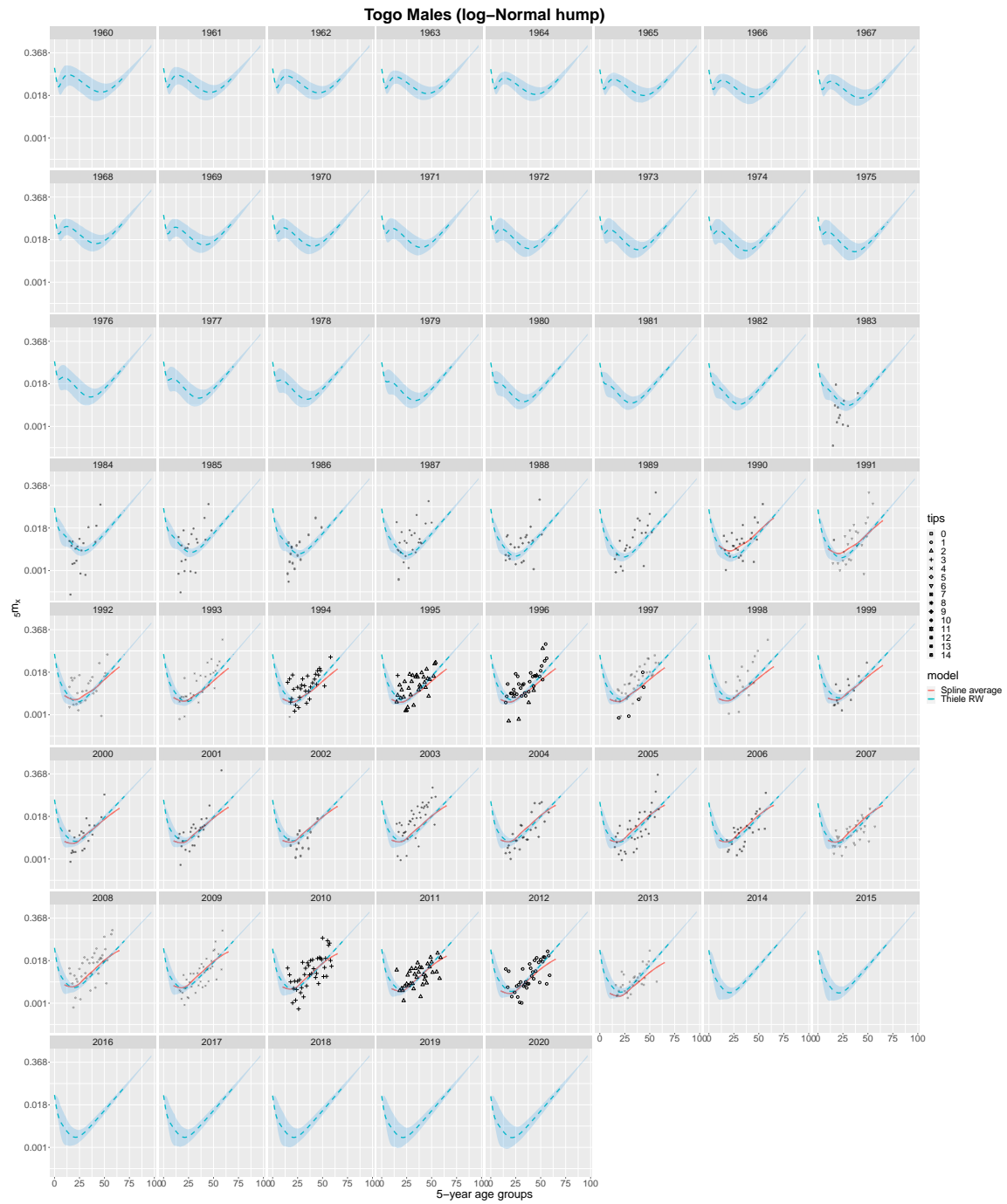
Figure 8: Mortality Schedules

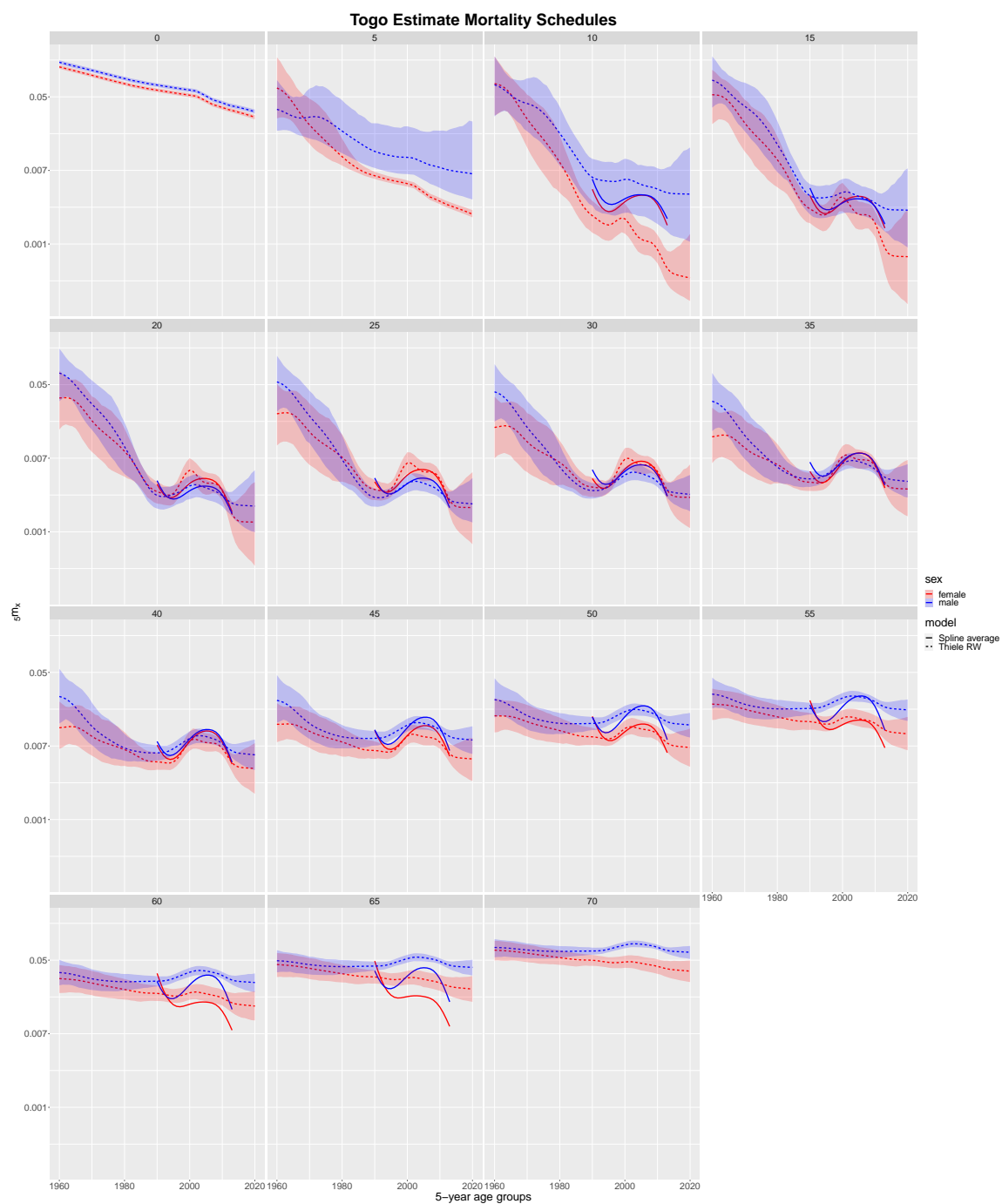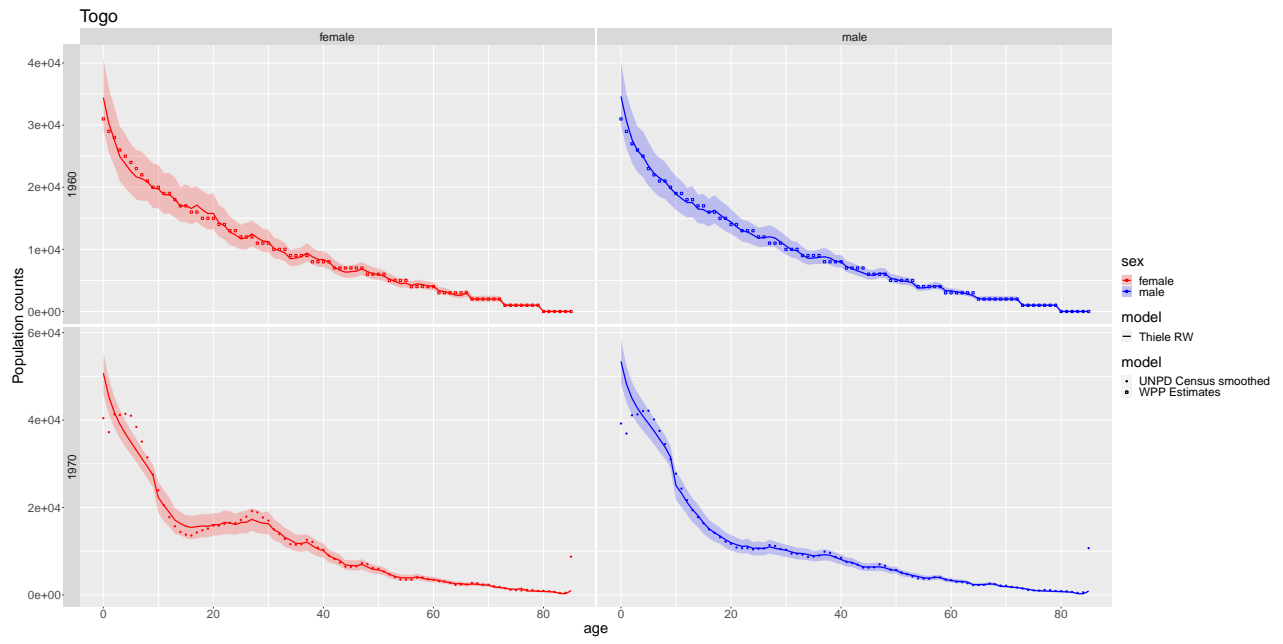Figure 9: Mortality Schedules

Figure 10: Population
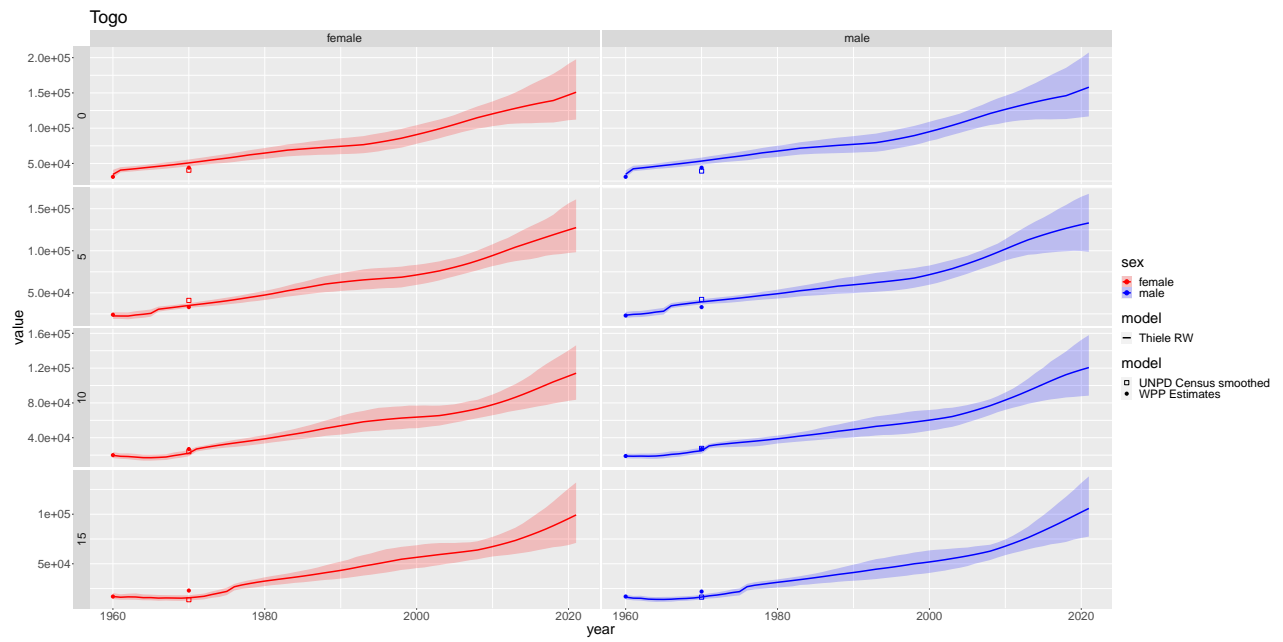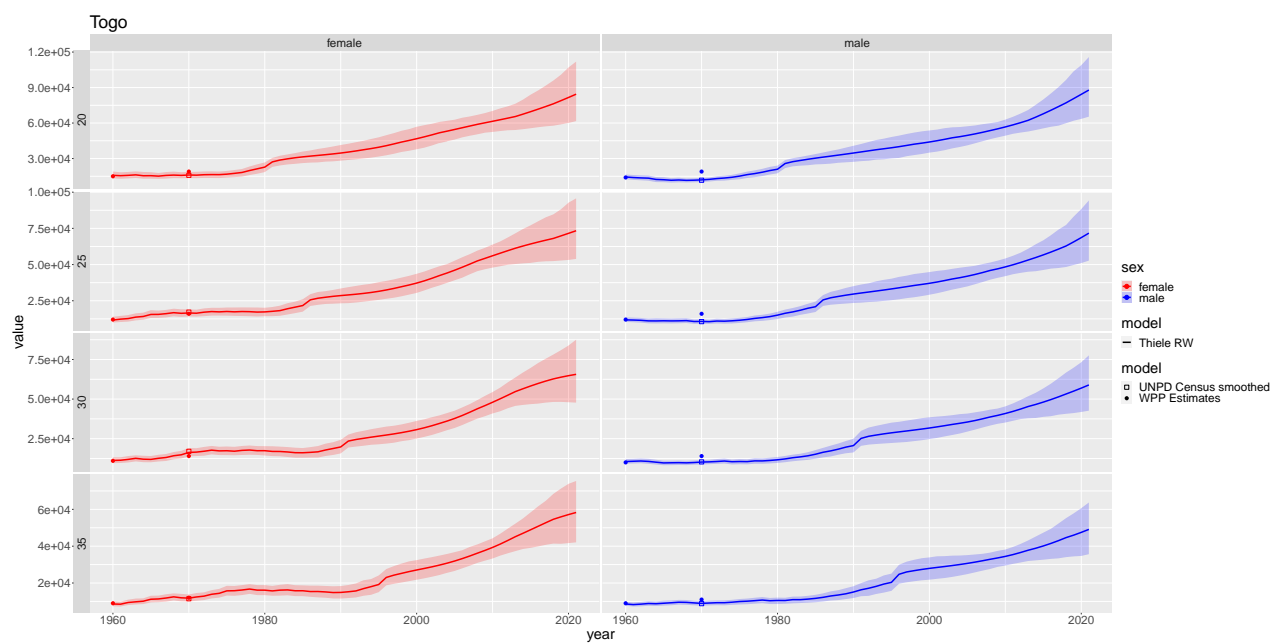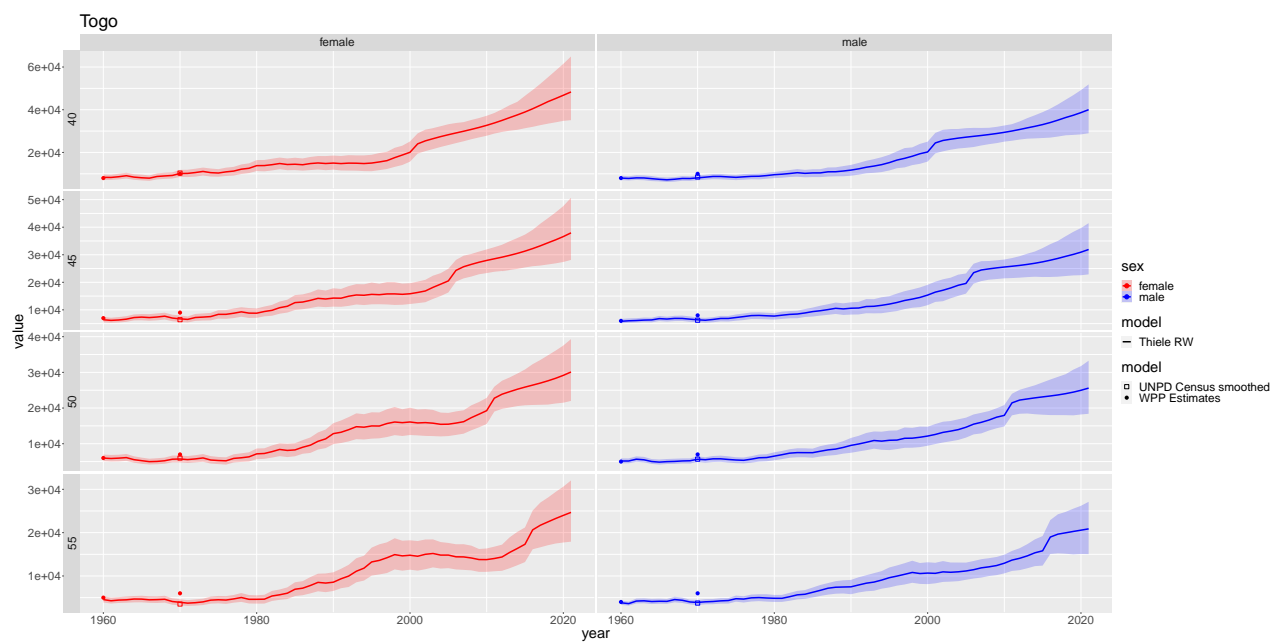

Figure 11: Population
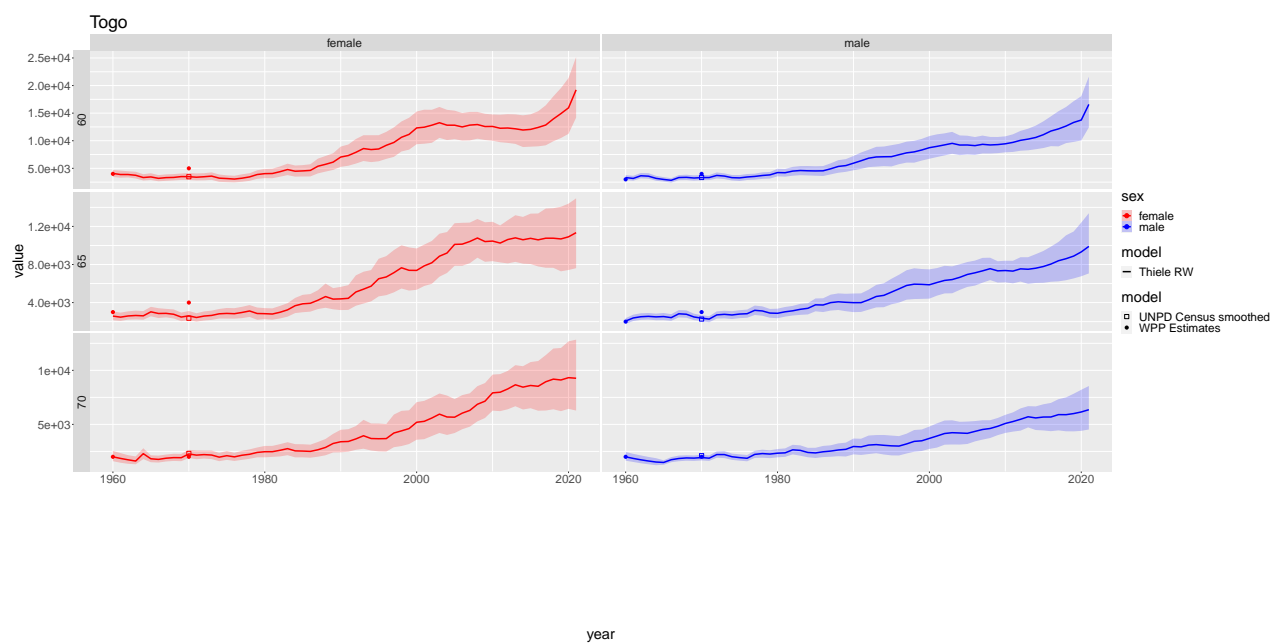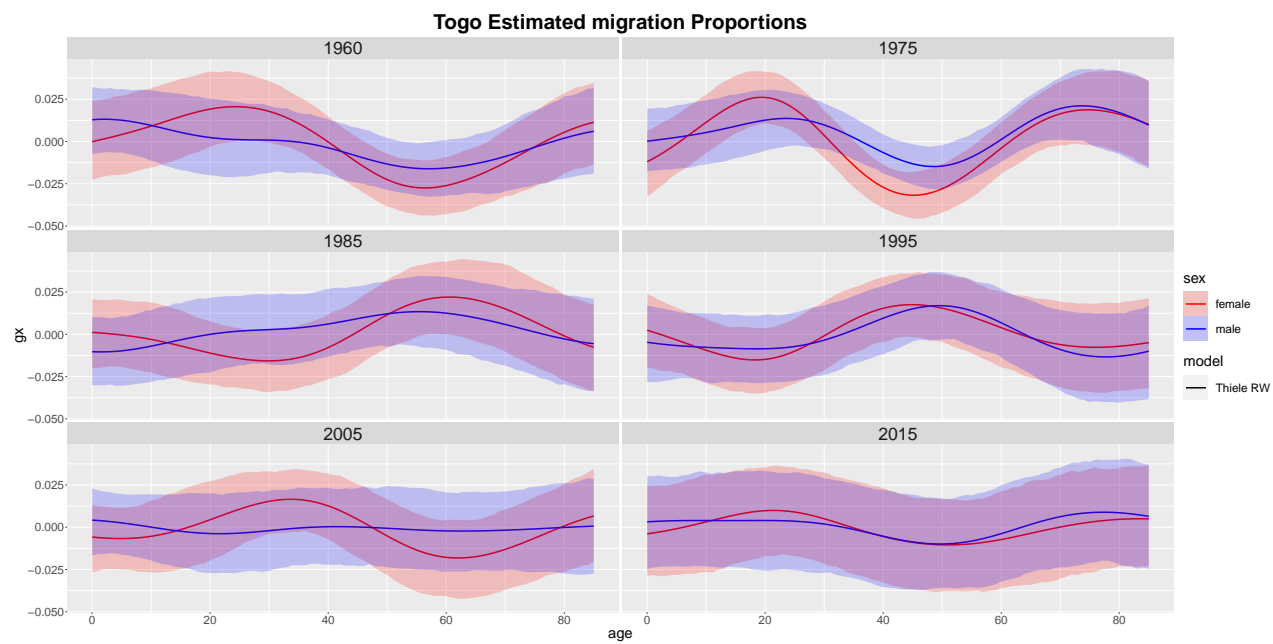
9

Figure 12: Population

Figure 13: Population

10

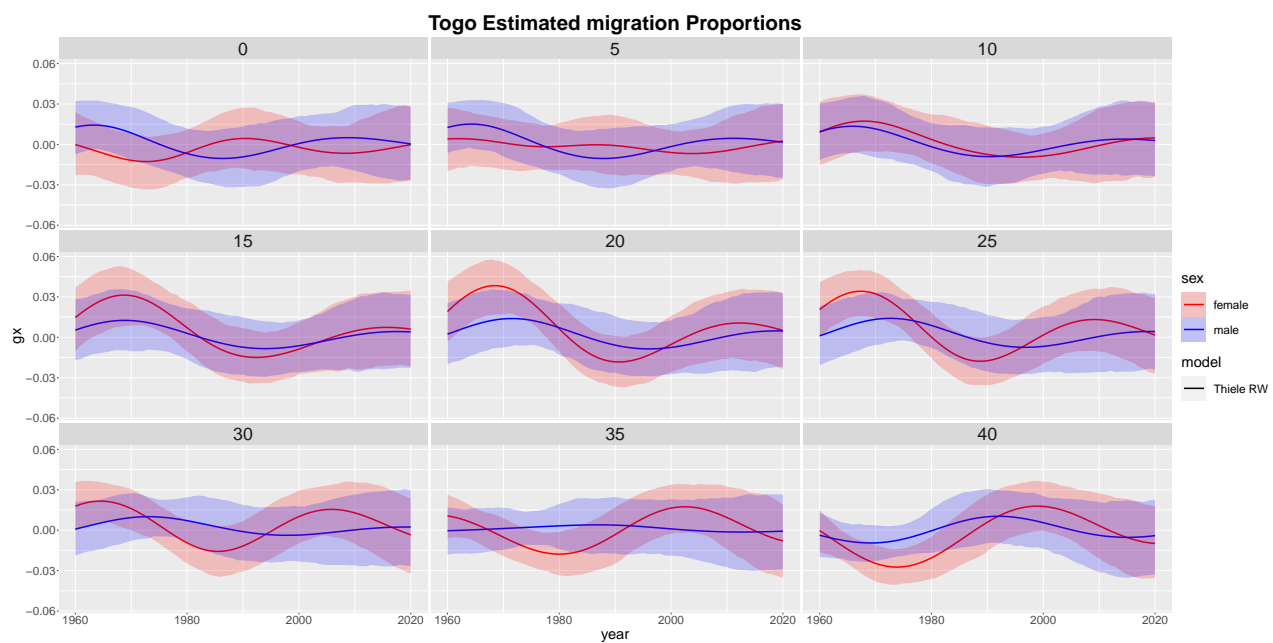Figure 14: Population
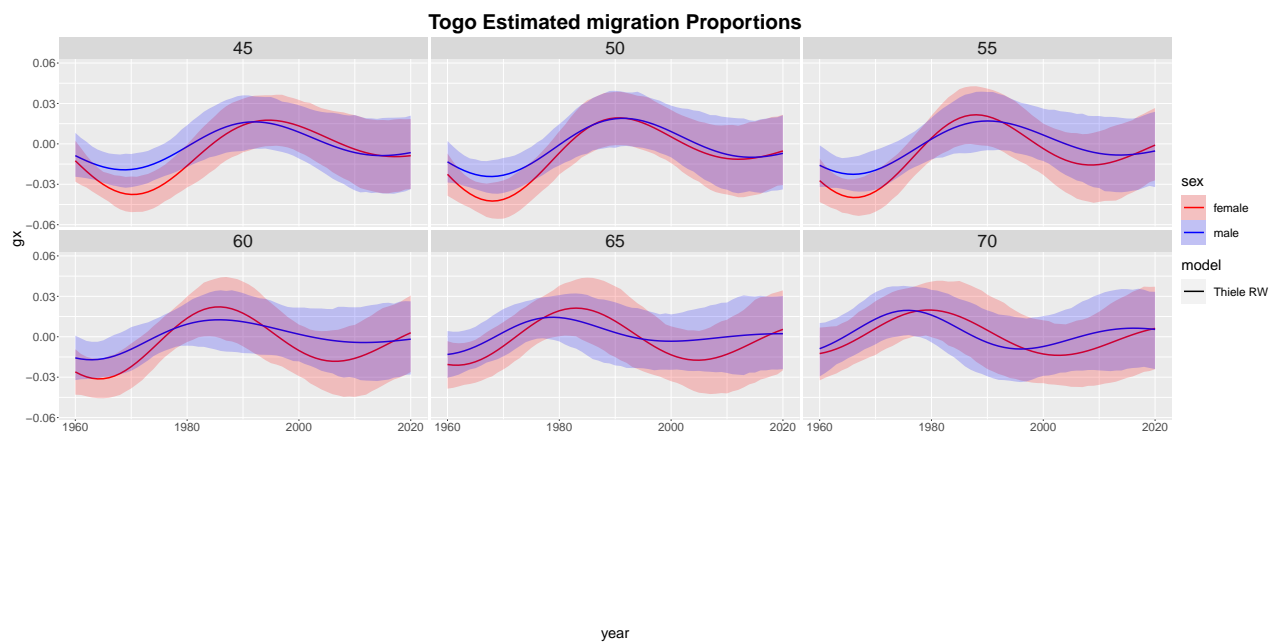

Figure 15: Migration

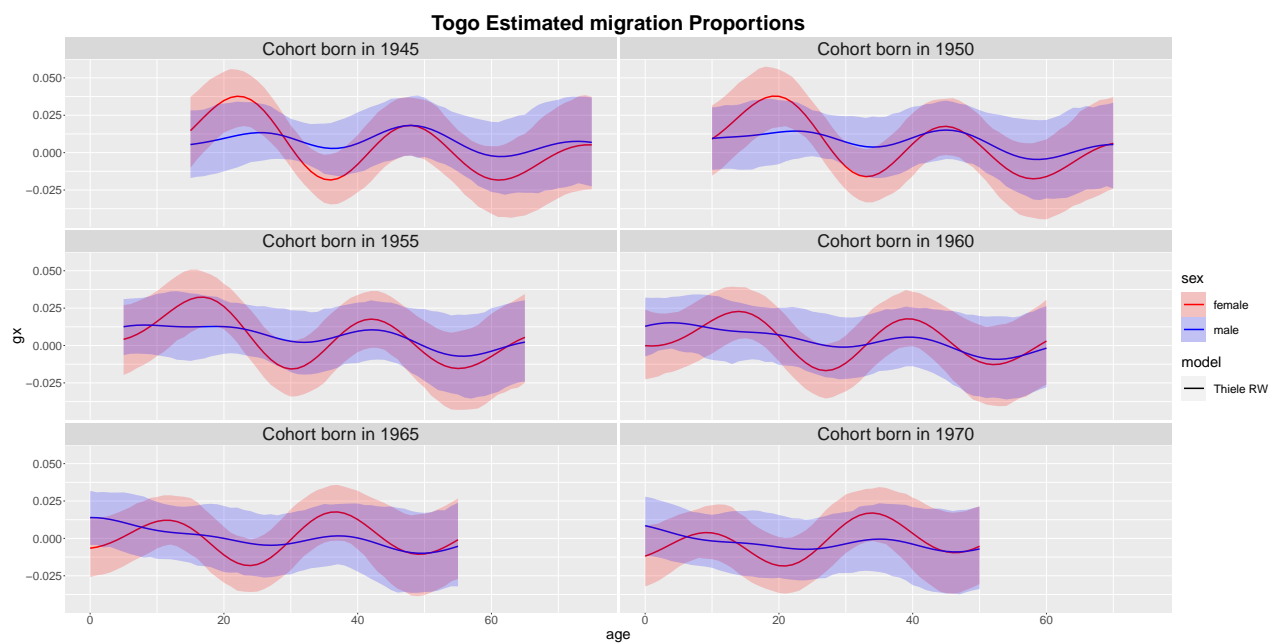Figure 16: Migration
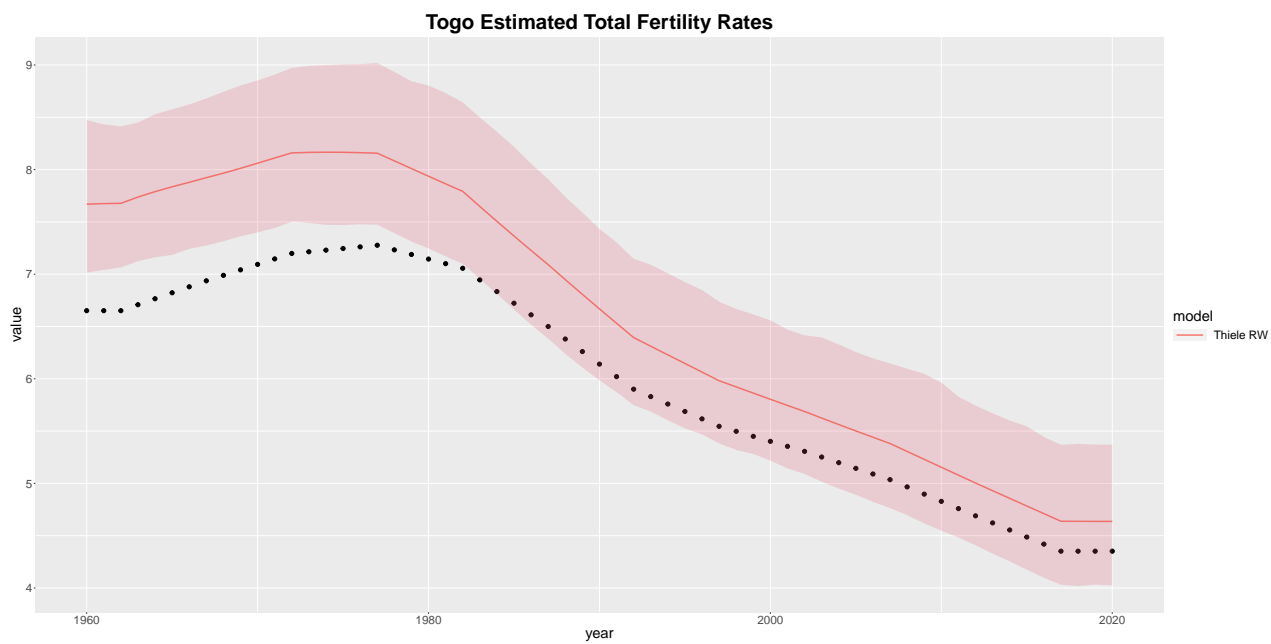

Figure 17: Migration

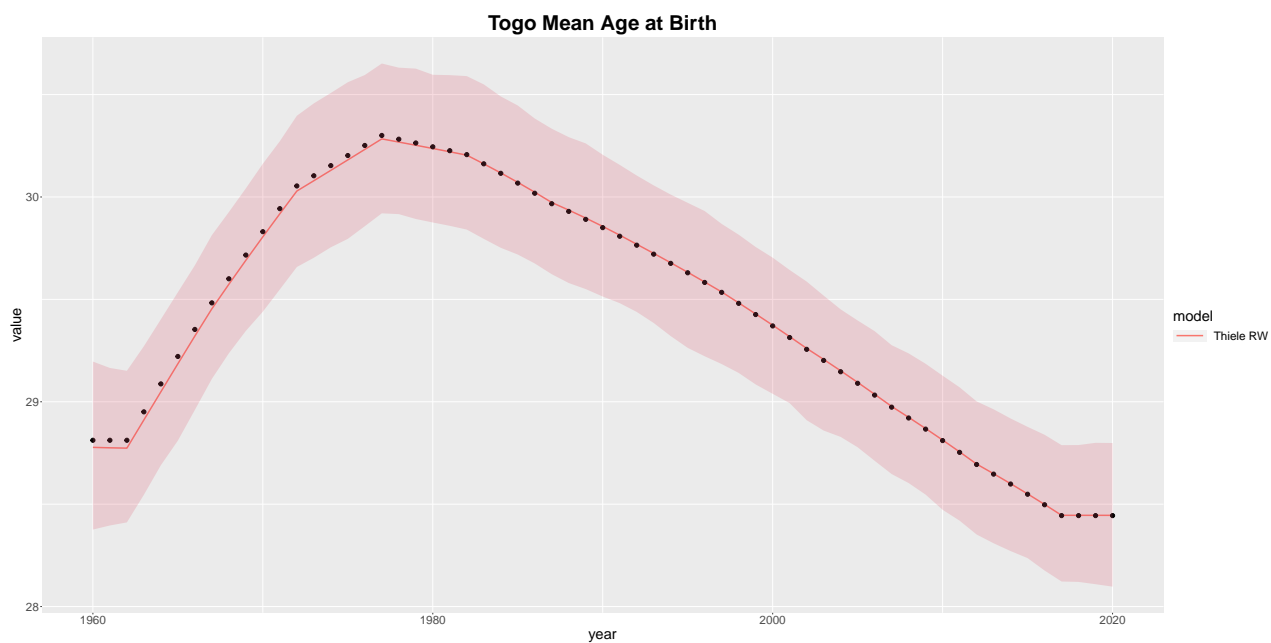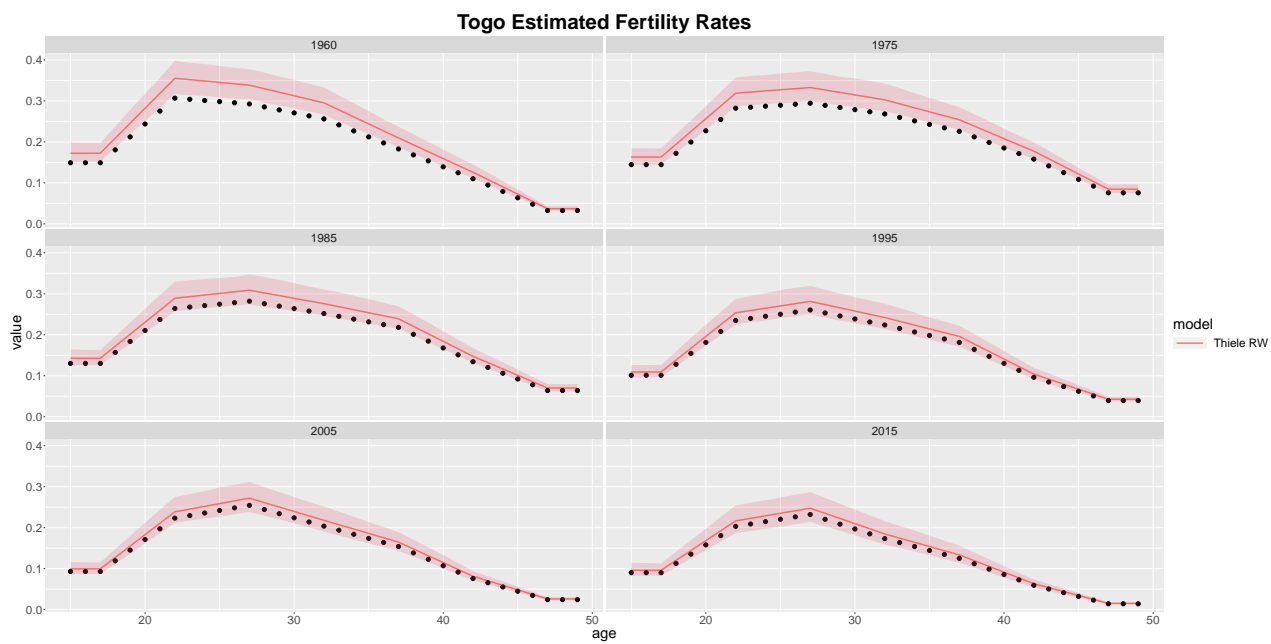Figure 18: Migration

Figure 19: Total Fertility

Figure 20: Mean age at births
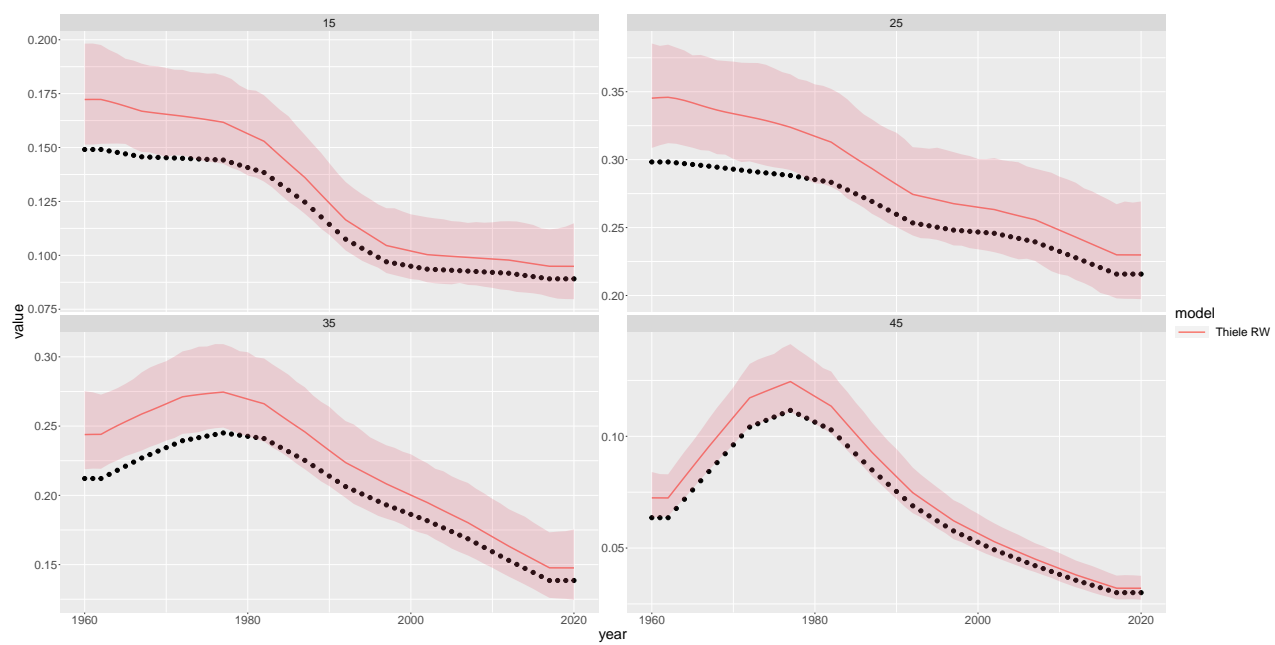

Figure 21: Fertility

Figure 22: Fertility