Uganda

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

## # A tibble: 86 x 5
##       age  `1969`  `1991`  `2002`  `2014`
##     <dbl>   <dbl>   <dbl>   <dbl>   <dbl>
## 1       0 139428. 340153. 502401  586516
## 2       1 186993. 308159. 447336. 574071.
## 3       2 191510. 314681. 450246. 591449
## 4       3 184954. 306938. 443253. 592649.
## 5       4 181866. 298637. 441935. 590639.
## 6       5 171741. 289064. 430734. 578980.
## 7       6 160554. 273462. 417834. 563422.
## 8       7 149220. 258883. 404547. 548996.
## 9       8 137717. 245903. 389734. 534496.
## 10      9 127022. 233325. 375940. 513891.
## # ... with 76 more rows

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

## # A tibble: 18 x 1
##       age
##     <dbl>
## 1       0
## 2       5
## 3      10
## 4      15
## 5      20
## 6      25
## 7      30
## 8      35
## 9      40
## 10     45
## 11     50
## 12     55
## 13     60
## 14     65
## 15     70
## 16     75
## 17     80
## 18     85

## [1] "Census Males"

## # A tibble: 86 x 5
##       age  `1969`  `1991`  `2002`  `2014`
##     <dbl>   <dbl>   <dbl>   <dbl>   <dbl>
## 1       0 135287. 334426. 505006  636238
## 2       1 183048. 306161. 449339. 621512.
## 3       2 187557. 310898. 450300. 634773.
## 4       3 182062. 303750. 442612. 633398.
## 5       4 179610. 295341. 441206. 627695.
## 6       5 169936. 285010. 430266. 612267.
```

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##  7      6 159365. 269372. 417144. 591845.
##  8      7 149658. 256683. 402868. 571051.
##  9      8 139504. 245108. 388078. 553863.
## 10      9 130558. 233840. 374840. 530259.
## # ... with 76 more rows

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

## # A tibble: 18 x 1
##       age
##     <dbl>
##  1      0
##  2      5
##  3     10
##  4     15
##  5     20
##  6     25
##  7     30
##  8     35
##  9     40
## 10     45
## 11     50
## 12     55
## 13     60
## 14     65
## 15     70
## 16     75
## 17     80
## 18     85
```

Thiele log-Normal Hump Spline

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

##       log_tau2_logpop       log_tau2_logpop       log_tau2_logpop       log_tau2_logpop            lo
##            5.18776837            6.65650938            5.15420333            6.59781732
##       log_dispersion        log_dispersion        log_lambda_tp               tp_slope
##            0.82006327            0.82088781            4.21924127           -0.02401523
##       log_lambda_phi        log_lambda_psi          log_lambda_A          log_lambda_B      log_la
##           12.67229088           12.69848172           12.59287628            9.10125897
##    log_lambda_epsilon
##            4.60876290
```
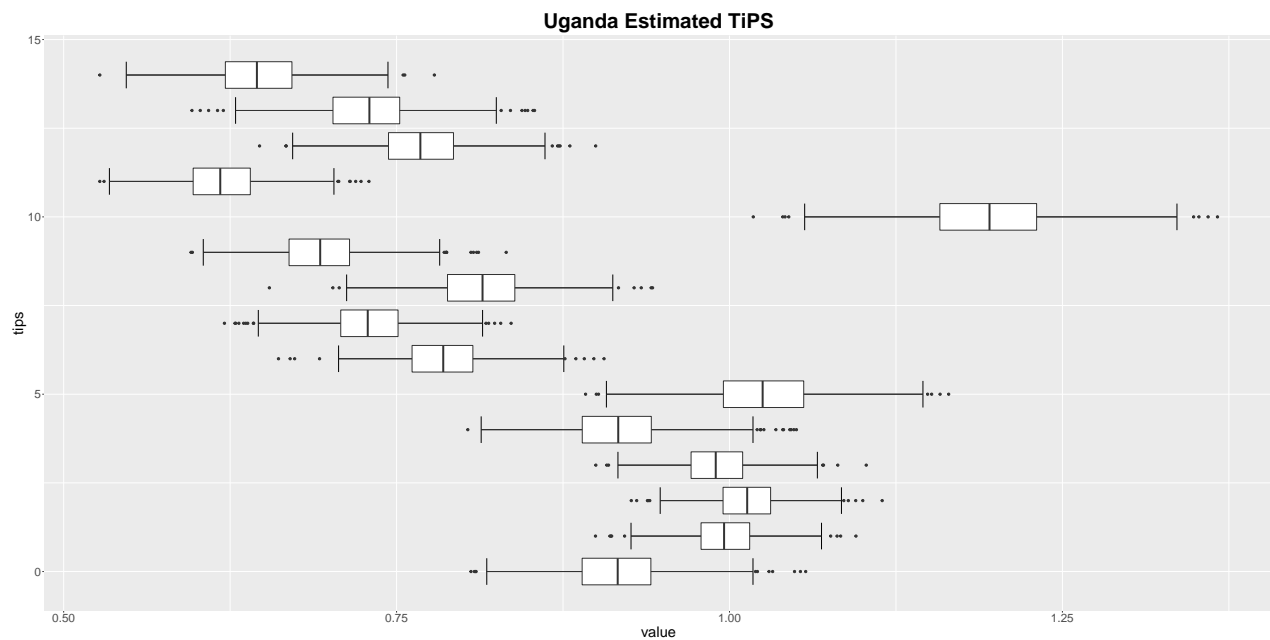
Figure 1: Estimated TiPS
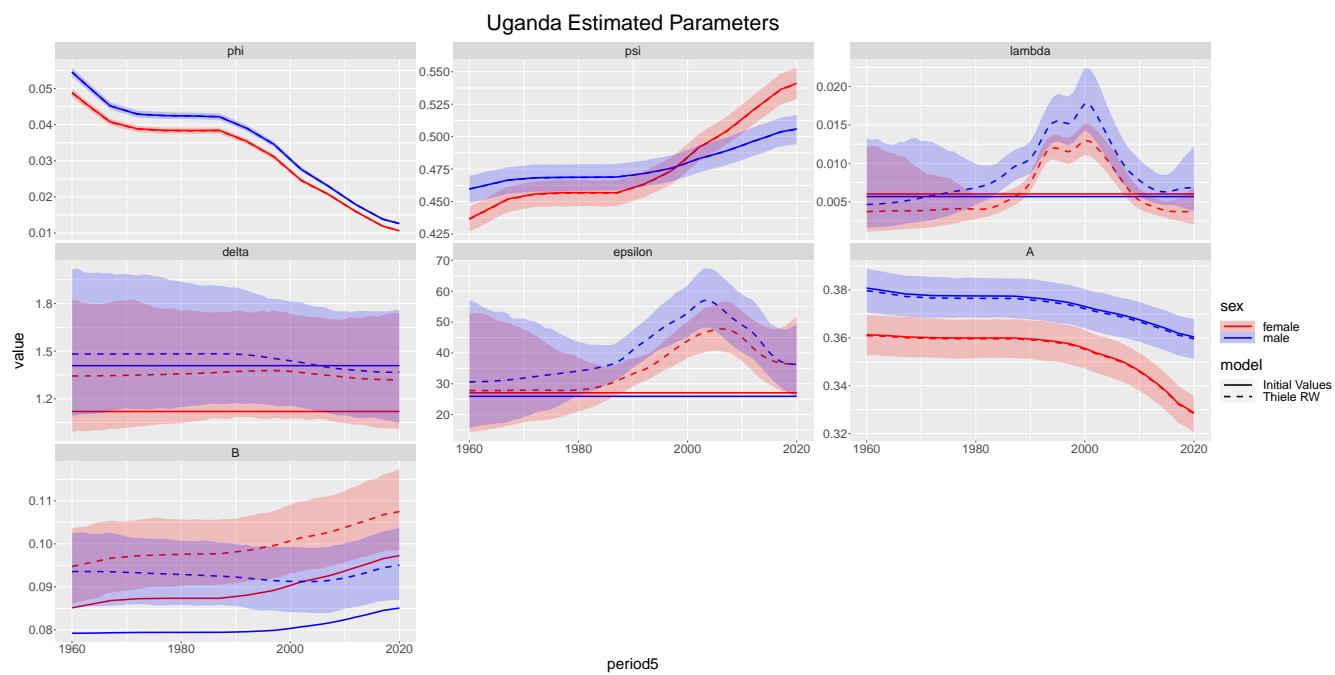
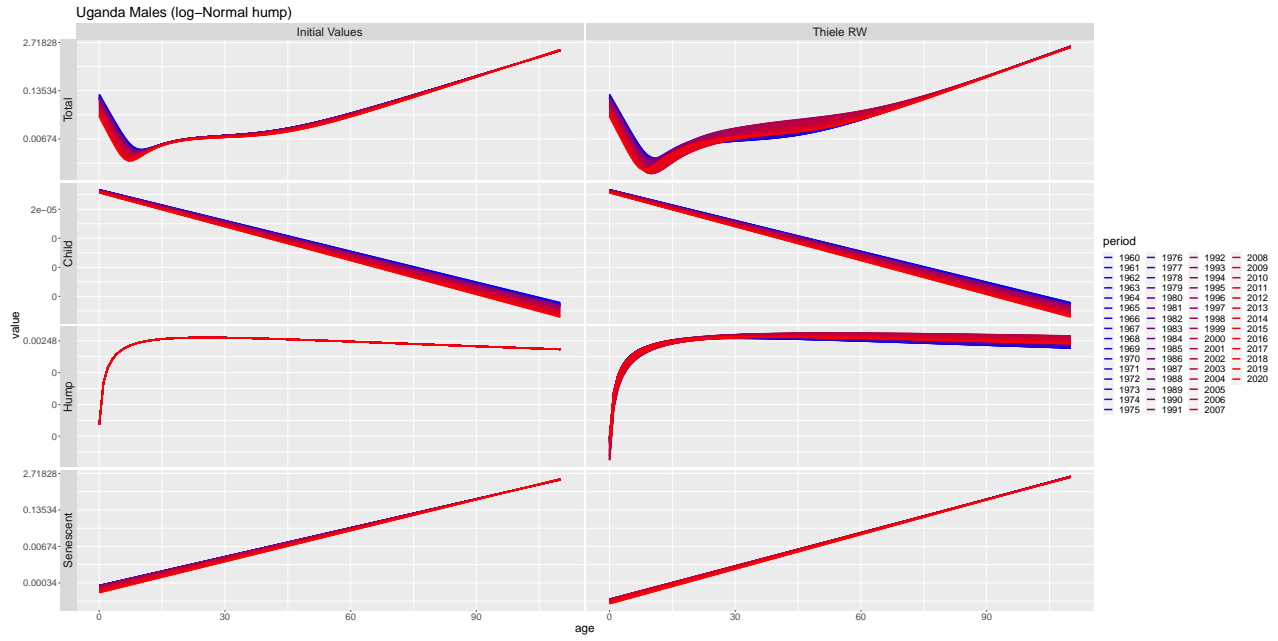Figure 2: Estimated parameters
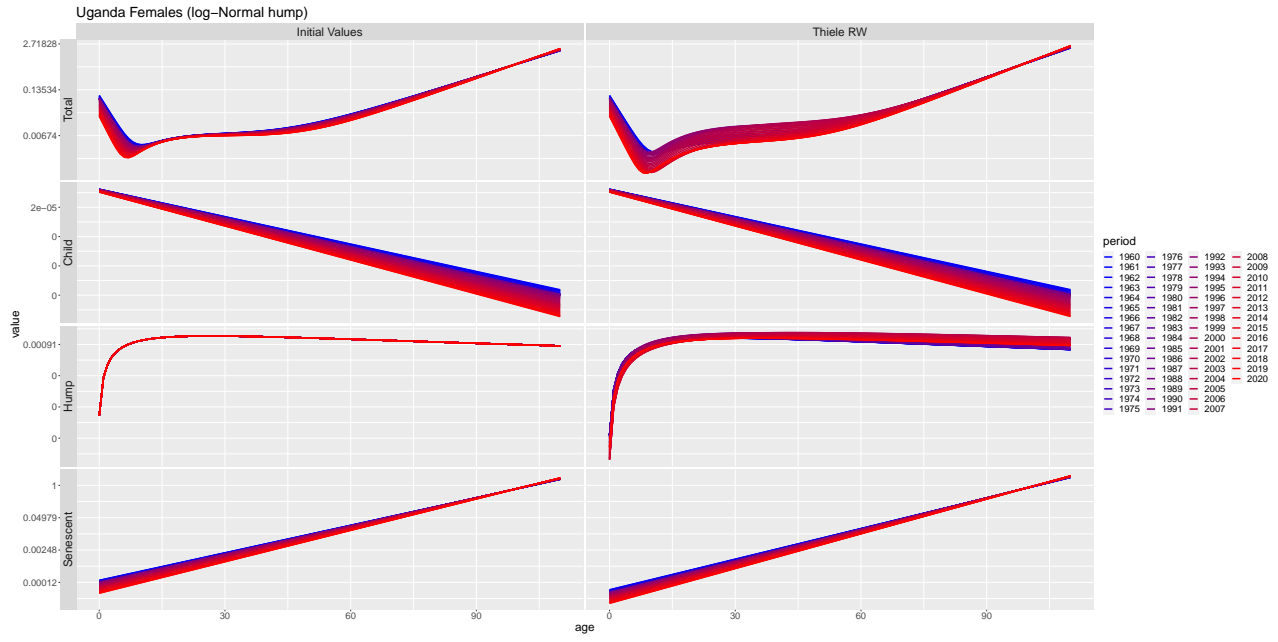
Figure 3: Thiele Decomposed

Figure 4: Thiele Decomposed
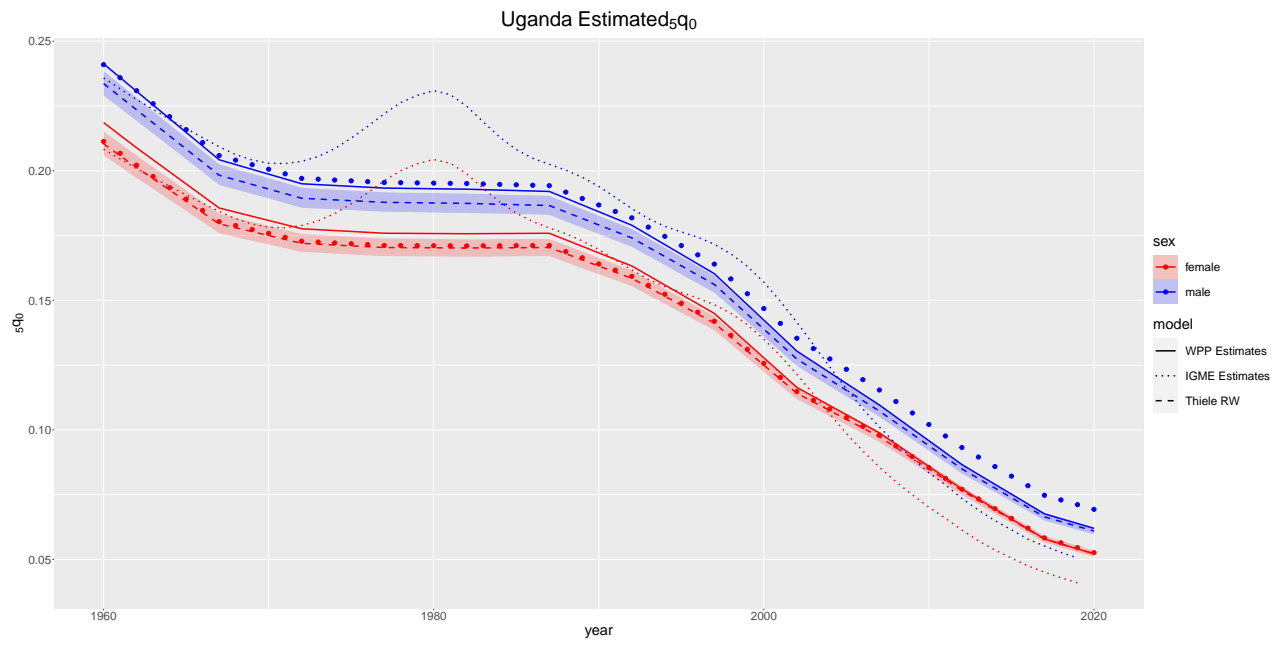
Figure 5: Estimated $_5q_0$
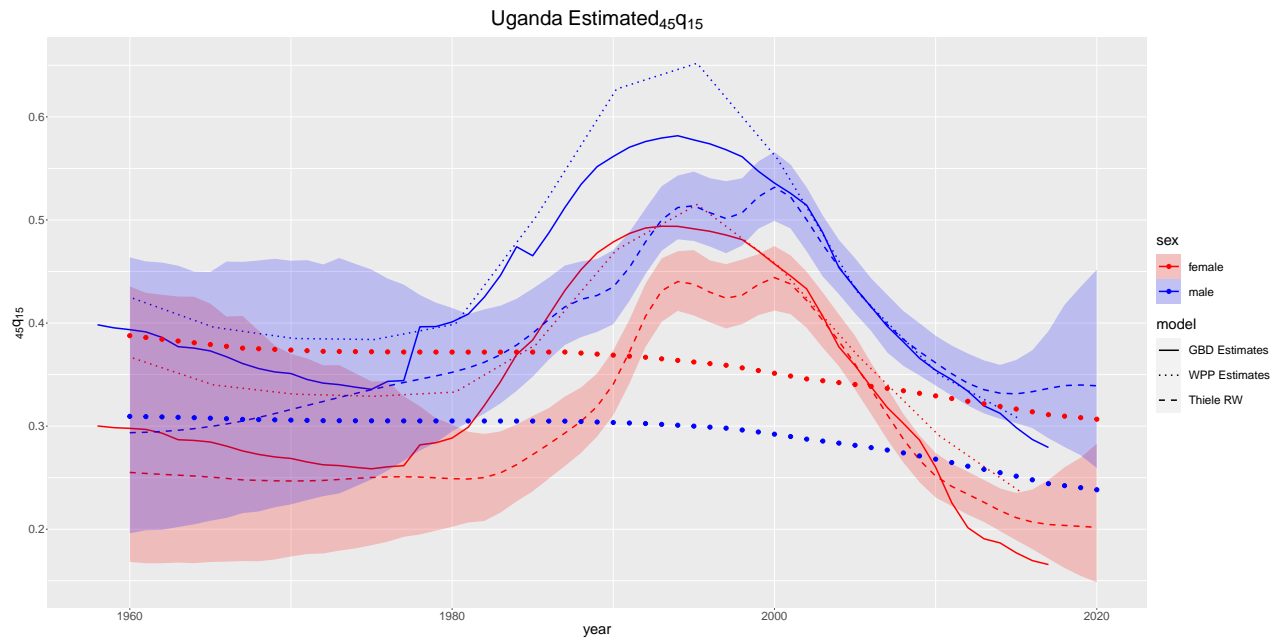

Figure 6: Estimated $_{45}q_{15}$
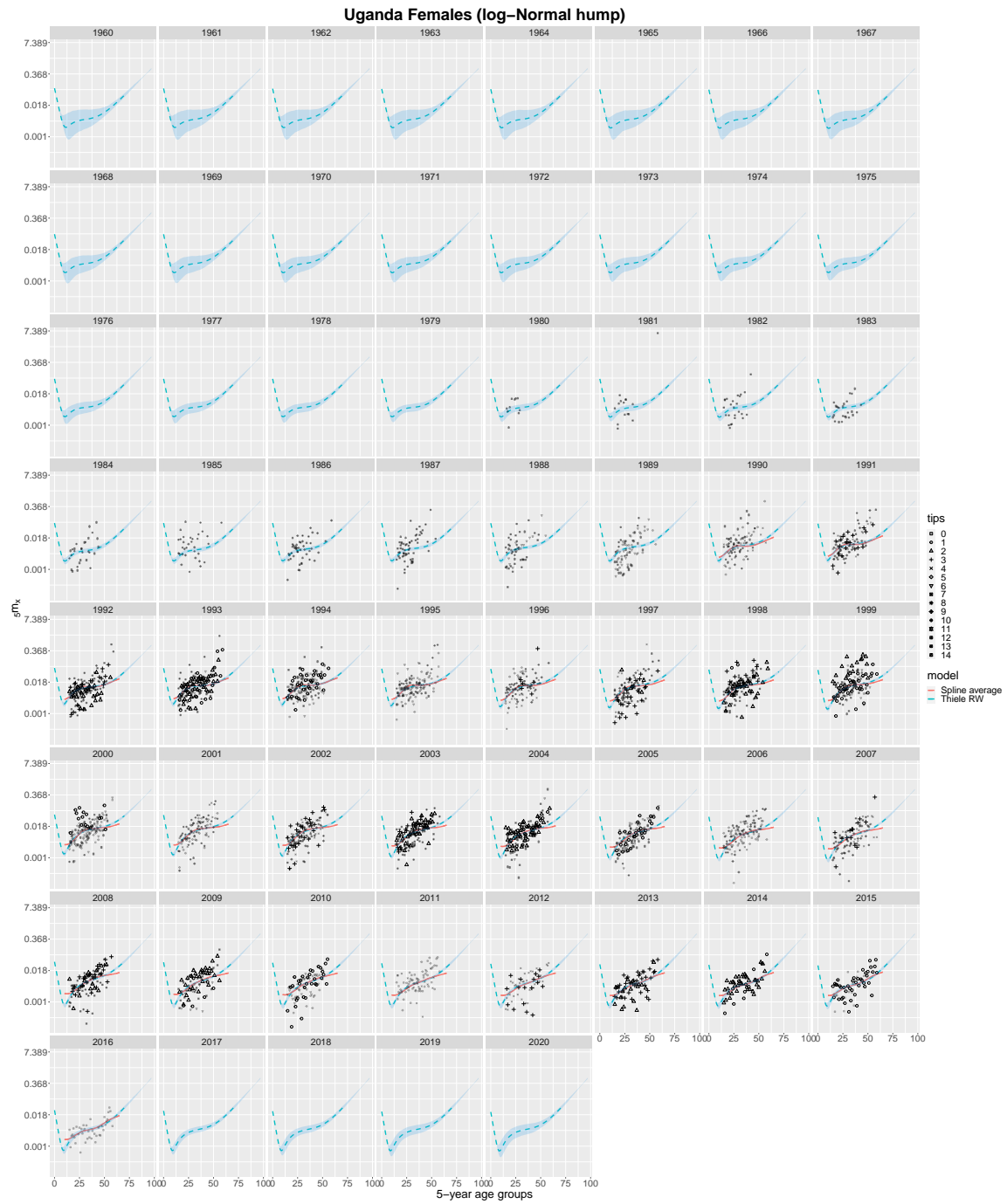
5

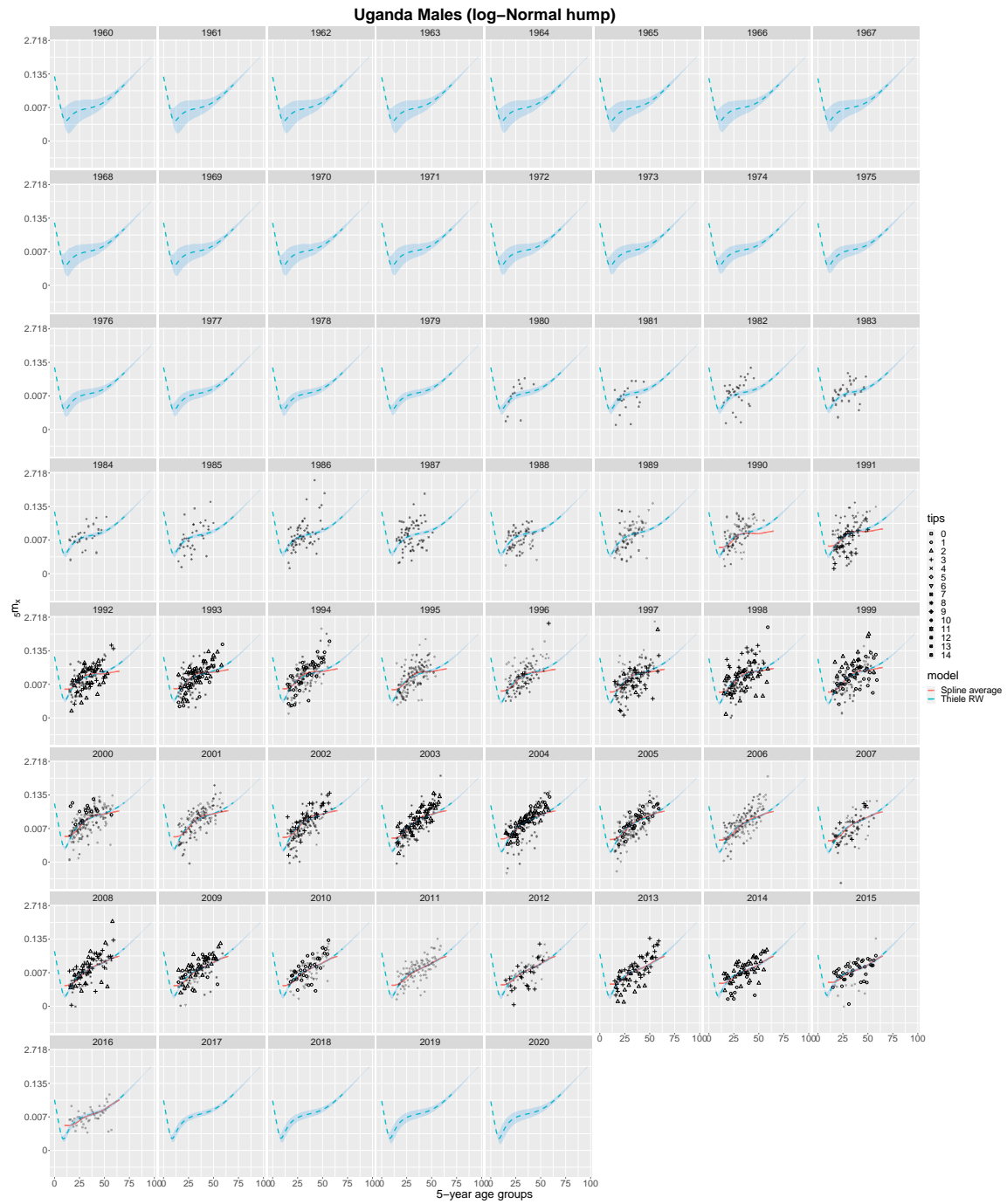**Uganda Females (log–Normal hump)**

Figure 7: Mortality Schedules

Figure 8: Mortality Schedules

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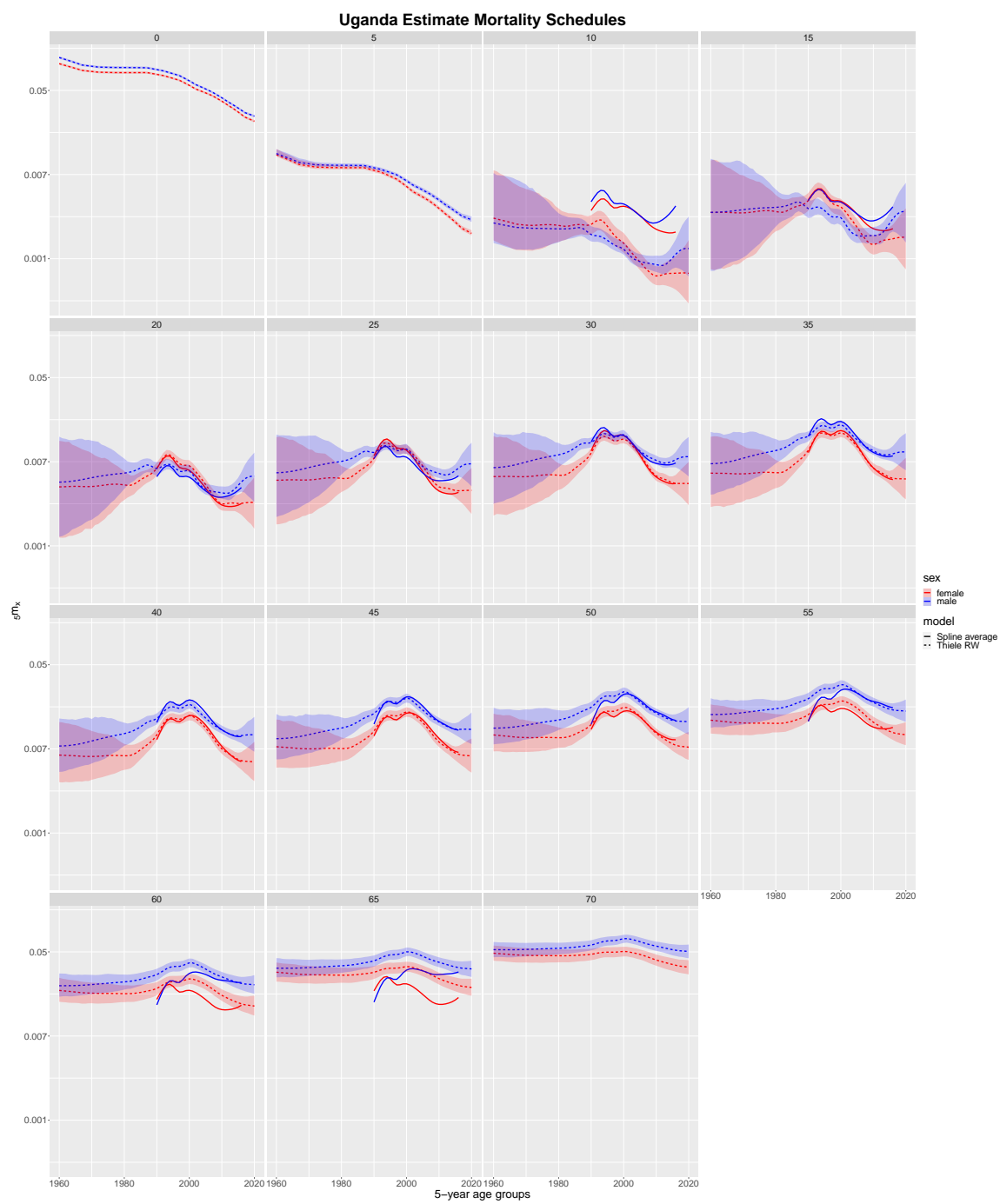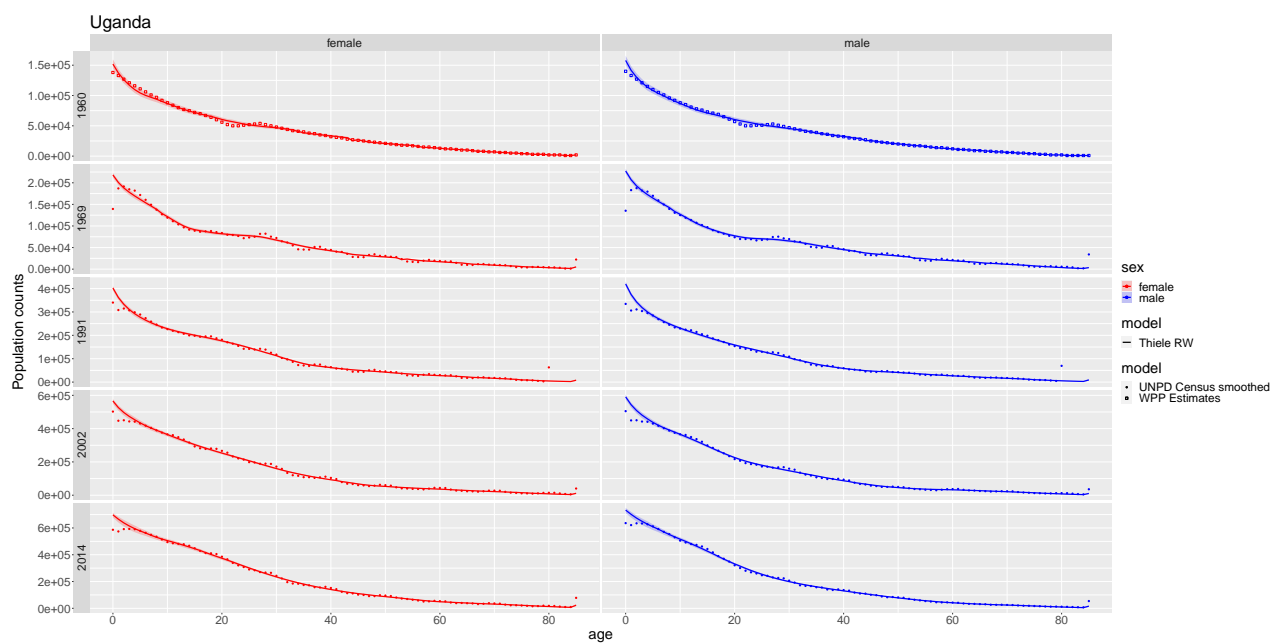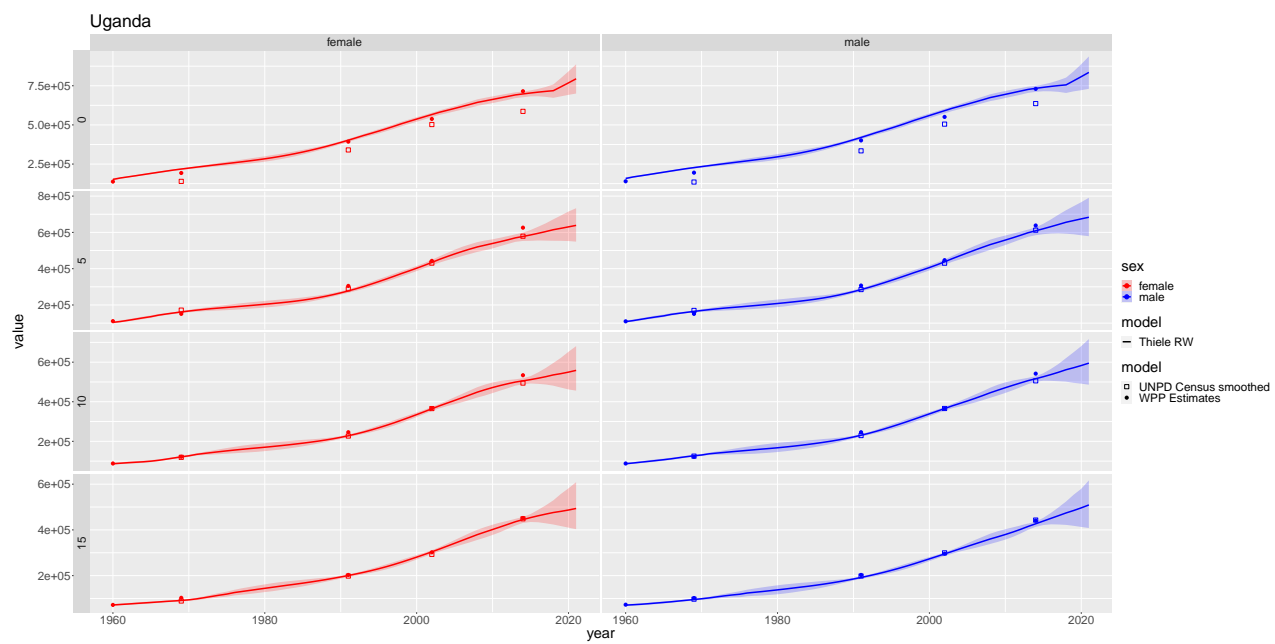Figure 9: Mortality Schedules
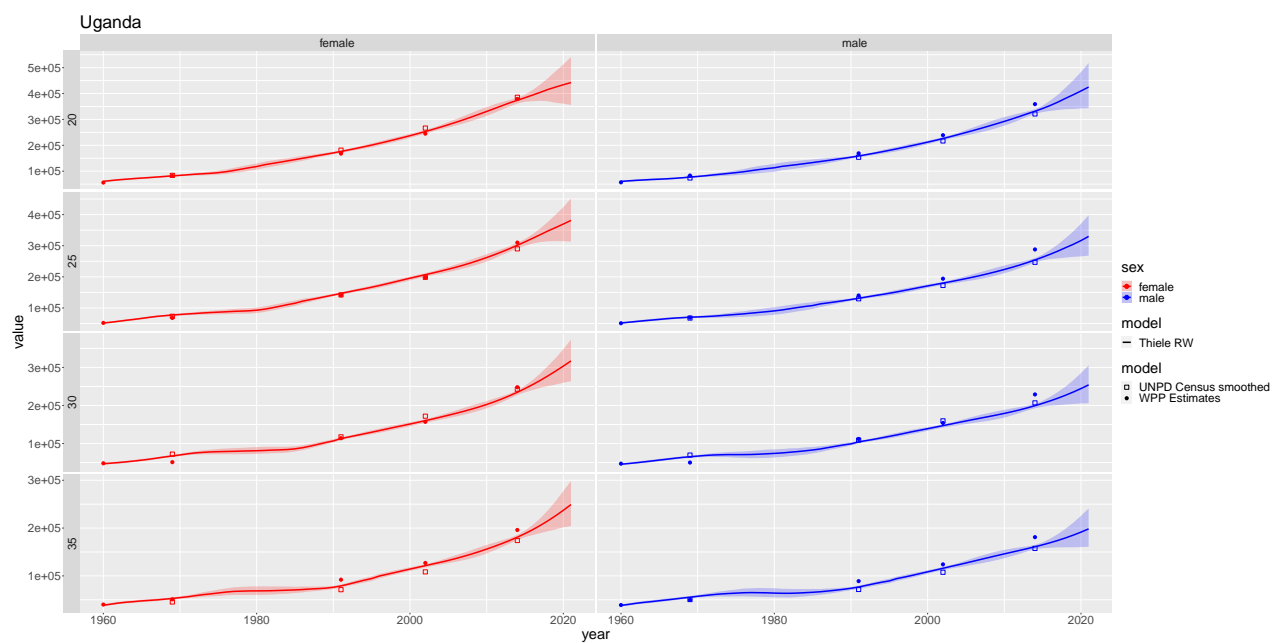
Figure 10: Population
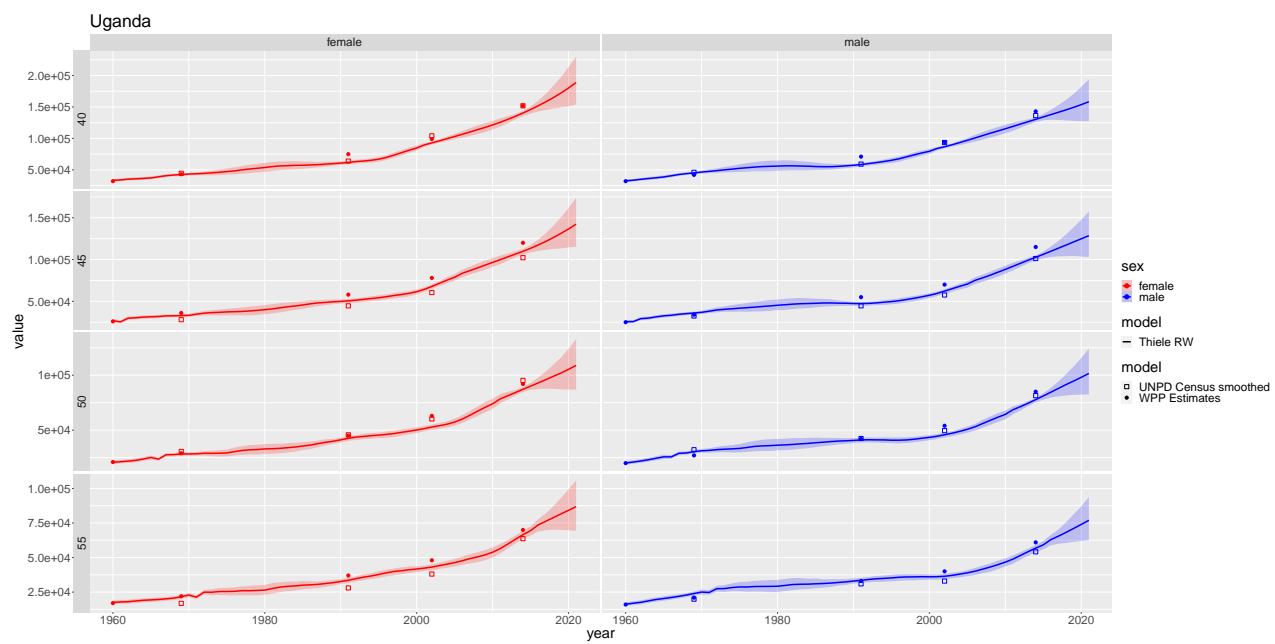

Figure 11: Population
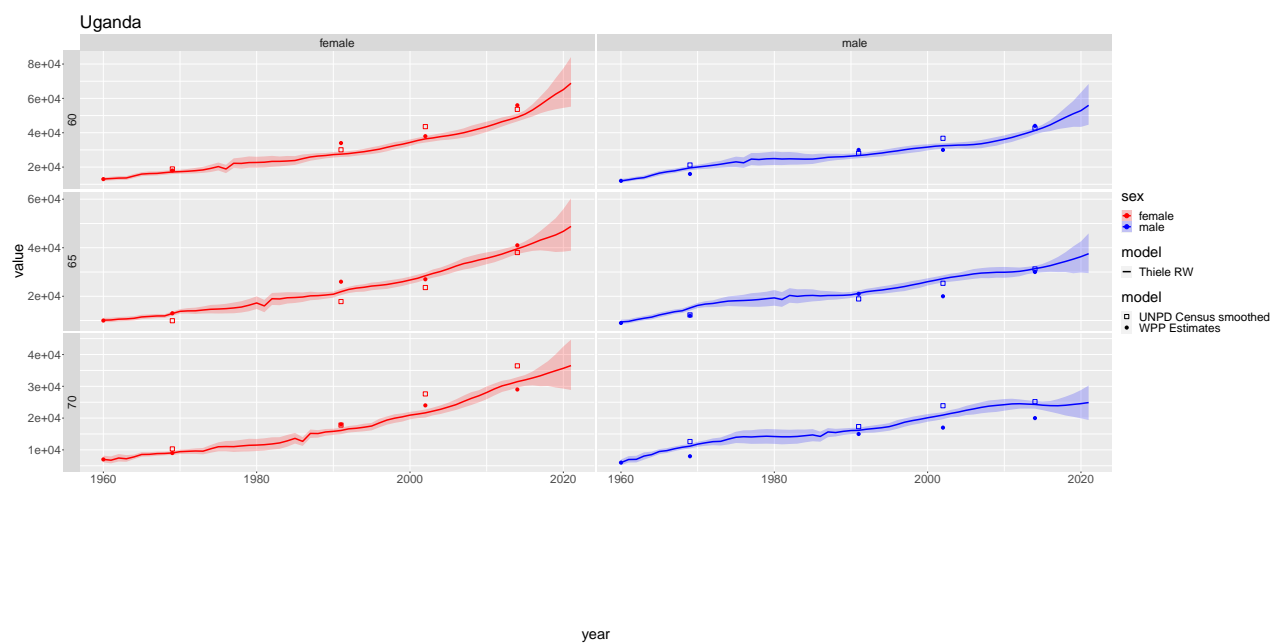
9

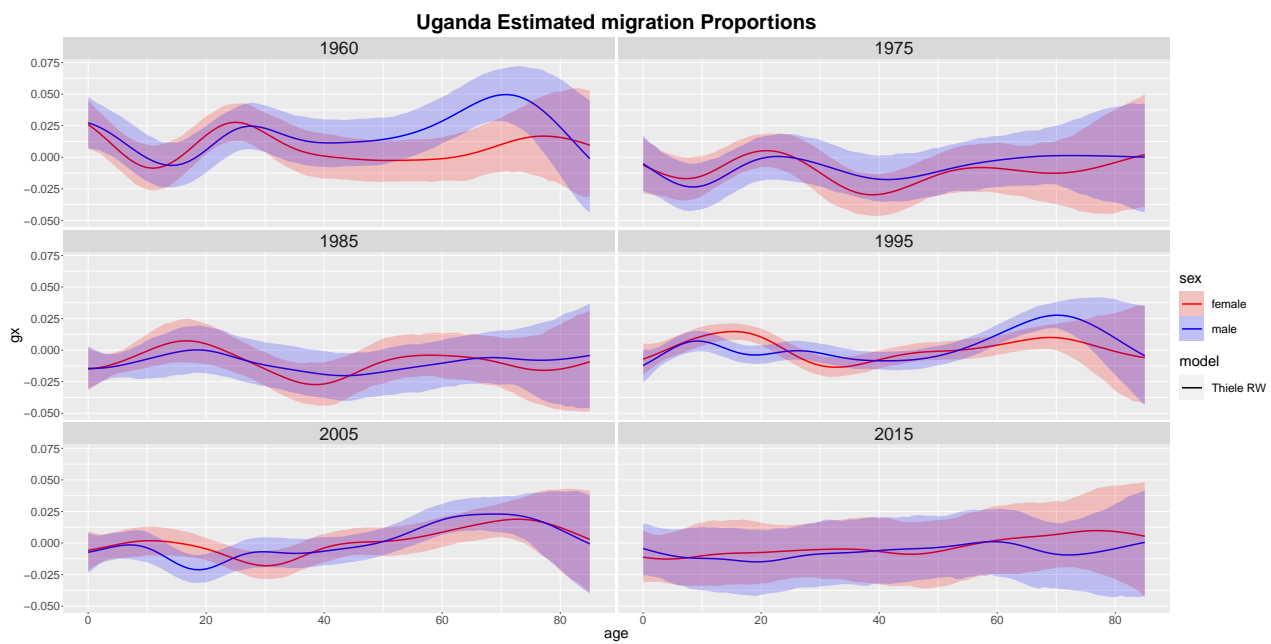Figure 12: Population

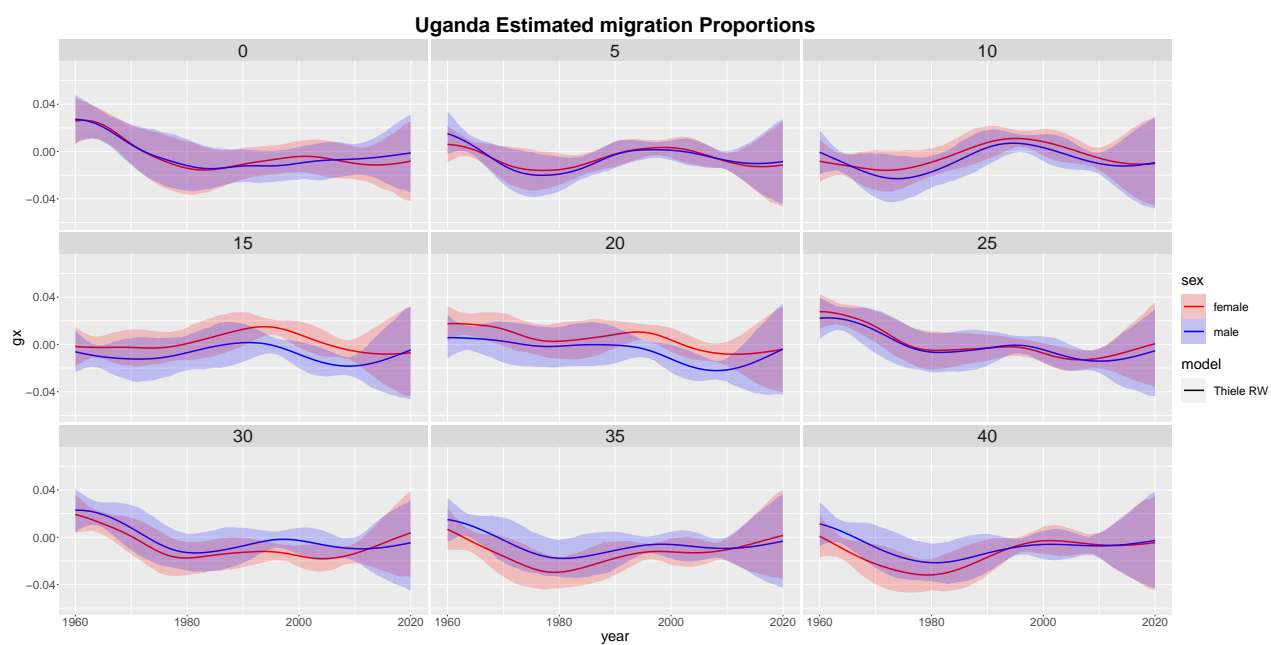

Figure 13: Population

Figure 14: Population

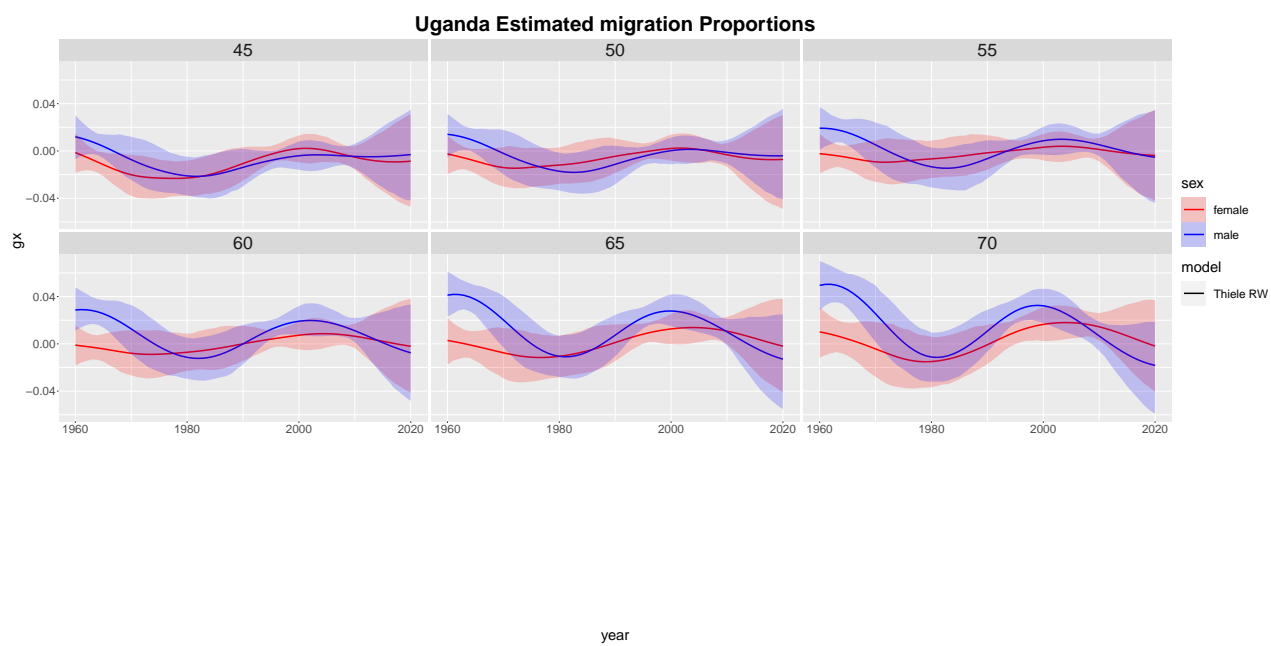Figure 15: Migration

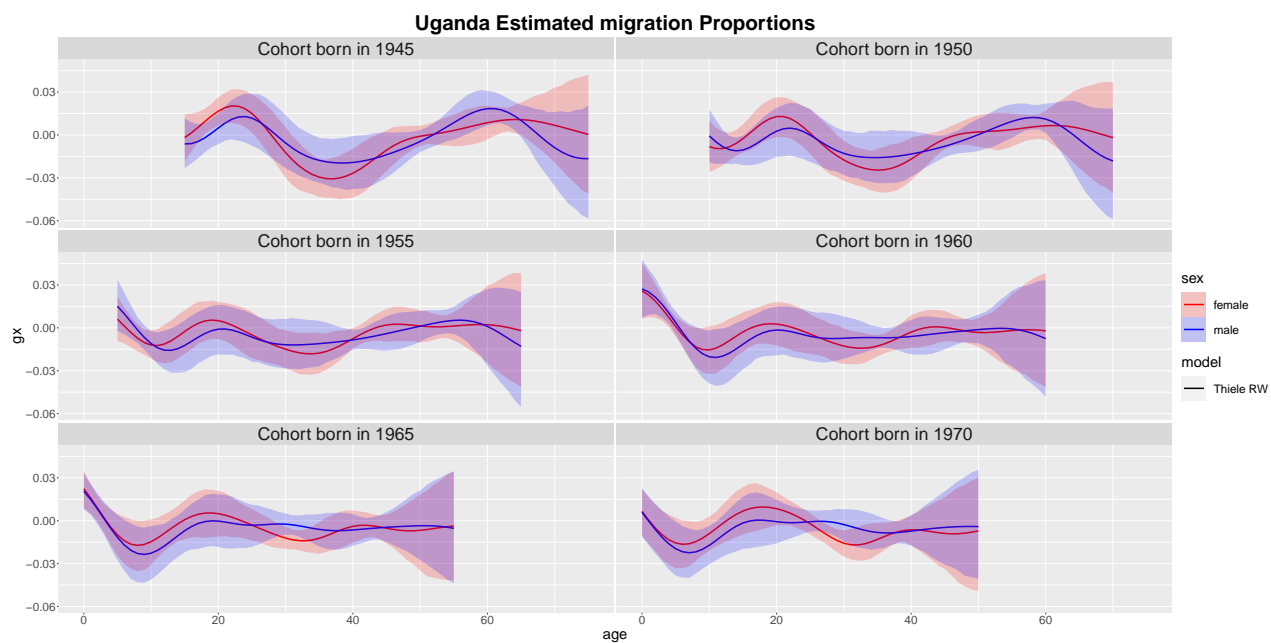Figure 16: Migration
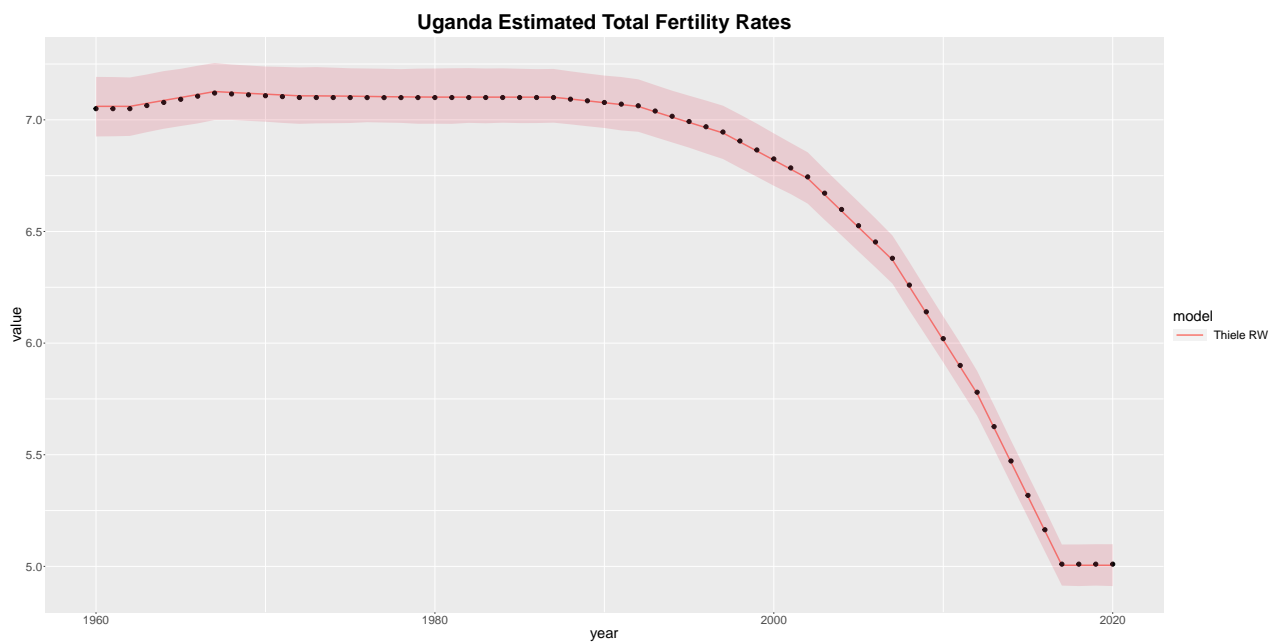

Figure 17: Migration
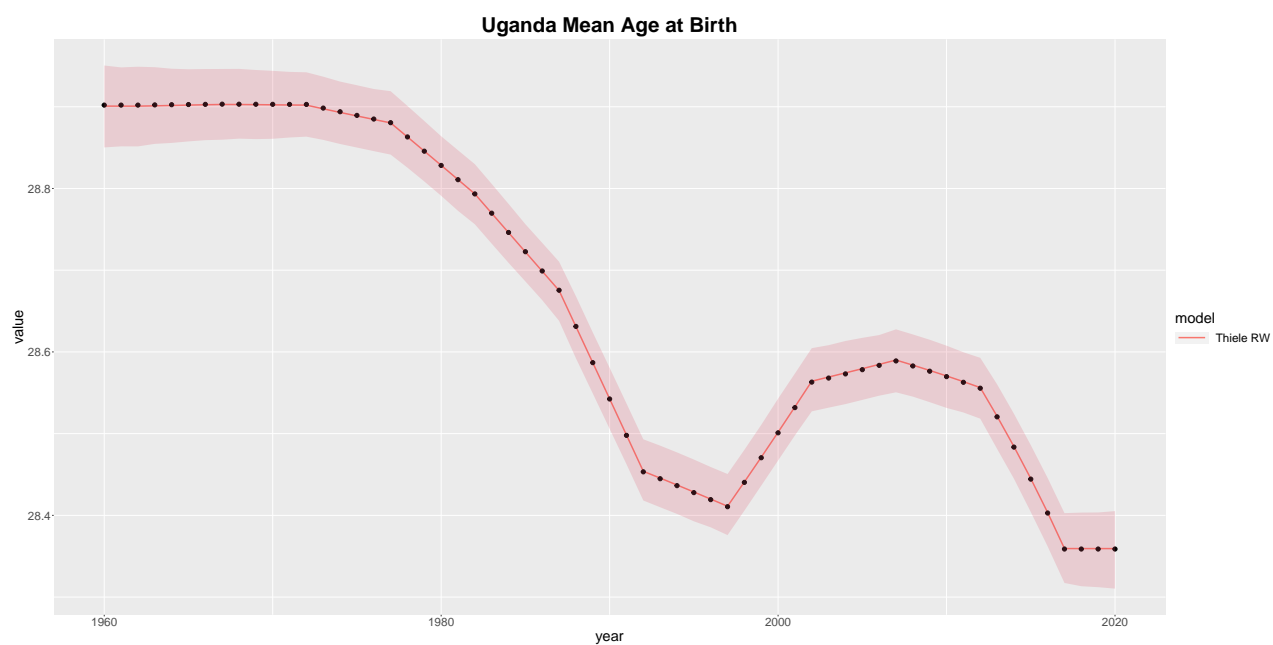
12

Figure 18: Migration

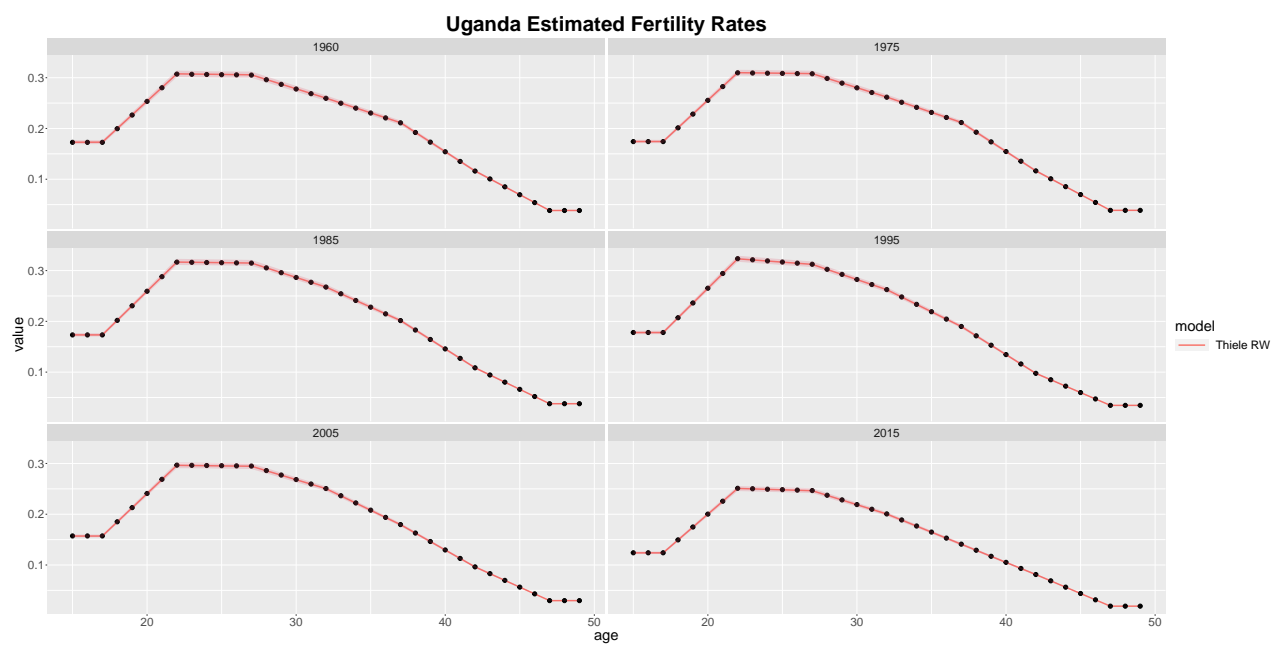Figure 19: Total Fertility

Figure 20: Mean age at births
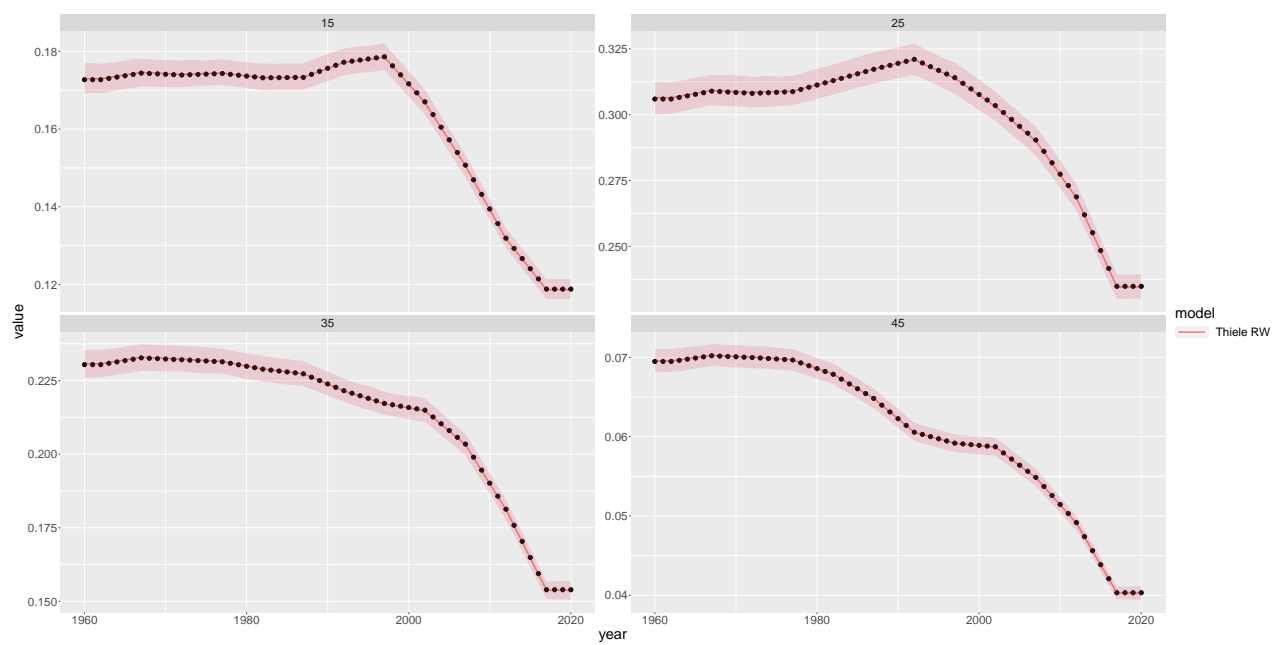

Figure 21: Fertility

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Figure 22: Fertility