Kenya

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

## # A tibble: 86 x 7
##      age  `1962`  `1969`  `1989`  `1999`  `2009`  `2019`
##    <dbl>  <dbl>   <dbl>   <dbl>   <dbl>   <dbl>   <dbl>
## 1      0 114962. 180506  401598. 543989. 605394. 549078.
## 2      1 124197. 208046. 365428. 433581. 566581. 575921.
## 3      2 141646. 212504. 376228. 440024. 584414. 597634.
## 4      3 141163. 208169. 374954. 428539. 590820. 611884.
## 5      4 137277. 206301. 369718. 422904. 593132. 619616.
## 6      5 132355. 198945. 364496. 409859. 579842. 620166.
## 7      6 130667. 189674. 354931. 397985. 565593. 616144.
## 8      7 125741. 180390. 348116. 395986. 553310. 615971.
## 9      8 118982. 169485. 337418. 406667. 547863. 622445.
## 10     9 110984. 158670. 325087. 410989. 535936. 626357.
## # ... with 76 more rows

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

## # A tibble: 18 x 2
##      age   `1979`
##    <dbl>    <dbl>
## 1      0 1423936.
## 2      5 1235895.
## 3     10 1046913.
## 4     15  872886.
## 5     20  701504.
## 6     25  546283.
## 7     30  423762.
## 8     35  334882.
## 9     40  274175.
## 10    45  227571.
## 11    50  184967.
## 12    55  142658.
## 13    60  109394.
## 14    65   84777.
## 15    70   62651.
## 16    75   86752.
## 17    80      NA
## 18    85      NA

## [1] "Census Males"

## # A tibble: 86 x 7
##      age  `1962`  `1969`  `1989`  `1999`  `2009`  `2019`
##    <dbl>  <dbl>   <dbl>   <dbl>   <dbl>   <dbl>   <dbl>
## 1      0 110490. 181280  407366. 559955. 617213. 548946.
## 2      1 119896. 209856. 370701. 444554. 579266. 580058.
## 3      2 137308. 214870. 380545. 449449. 596090. 601059.
## 4      3 136838. 211596. 380154. 438004. 604392. 617870.
## 5      4 134196. 210258. 374474. 432305. 607876. 626295.
## 6      5 130987. 203113. 368800. 419618. 595609. 627665.
```

```
## 7      6 130752. 194028. 358900. 407236. 580858. 623689.
## 8      7 127766. 185536. 352312. 403393. 566023. 621037.
## 9      8 123091. 175184. 340718. 414324. 561125. 628883.
## 10     9 117015. 165066. 327739. 416104. 548548. 632145.
## # ... with 76 more rows

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

## # A tibble: 18 x 2
##      age   `1979`
##    <dbl>    <dbl>
## 1      0 1424953.
## 2      5 1244344.
## 3     10 1052936.
## 4     15  851898.
## 5     20  664211.
## 6     25  519992.
## 7     30  404695.
## 8     35  312473.
## 9     40  258557.
## 10    45  221009.
## 11    50  181751.
## 12    55  143338.
## 13    60  114261.
## 14    65   93665.
## 15    70   66506.
## 16    75   87947.
## 17    80       NA
## 18    85       NA
```

Thiele log-Normal Hump Spline

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

```
##       log_tau2_logpop      log_tau2_logpop      log_tau2_logpop      log_tau2_logpop          lo
##            5.3426946777         7.2102249320         5.4670290104         7.1315954731          9
##         log_dispersion       log_dispersion          log_lambda_tp             tp_slope
##            0.7378842177         0.6253281941         3.0880685446        -0.0009686567          0
##          log_lambda_phi       log_lambda_psi           log_lambda_A         log_lambda_B     log_la
##           12.7136106183        12.7086616620        12.6412194076        11.3102004749          3
##      log_lambda_epsilon
##            5.2886324971
```
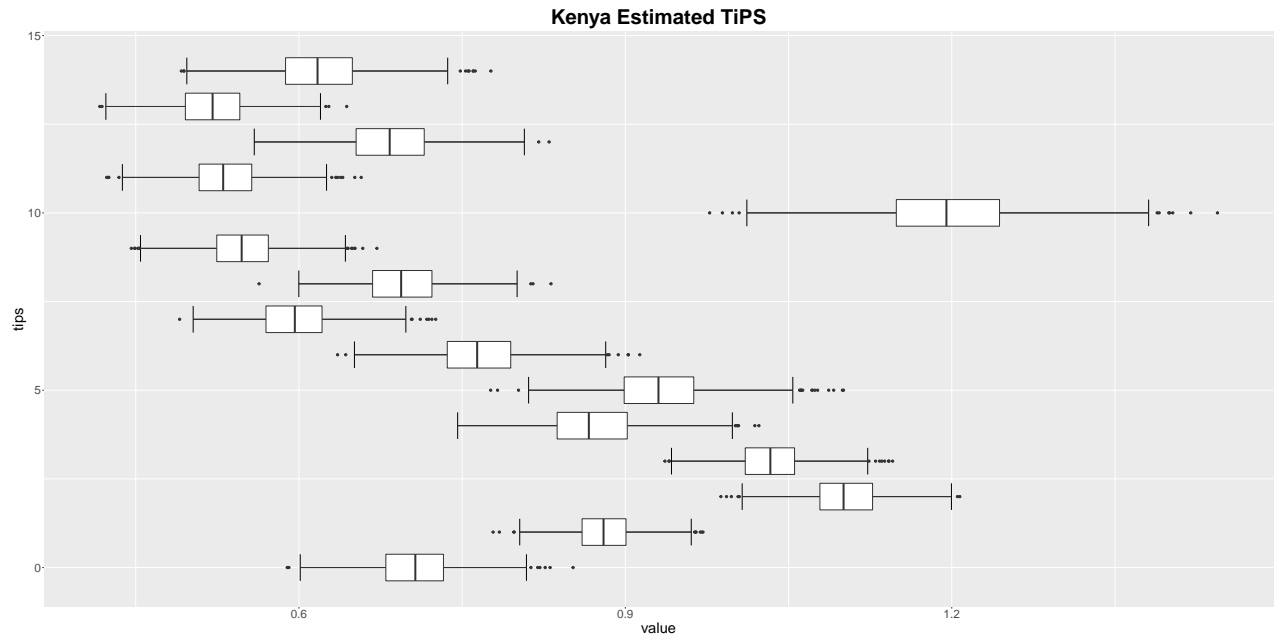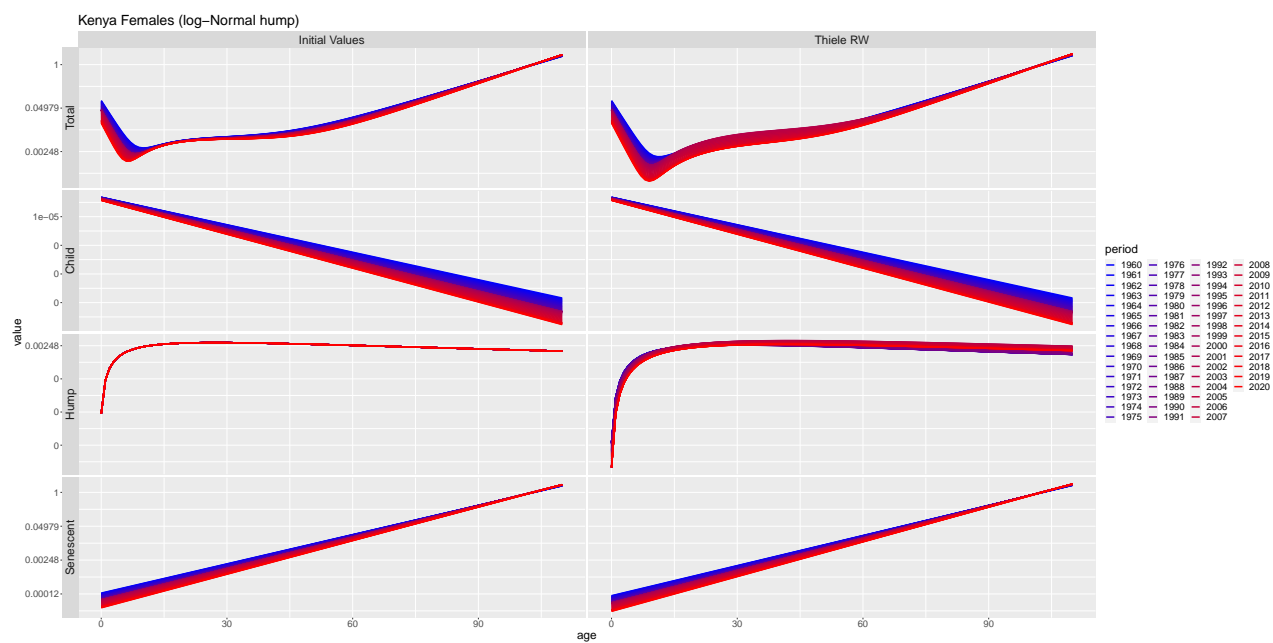
Figure 1: Estimated TiPS
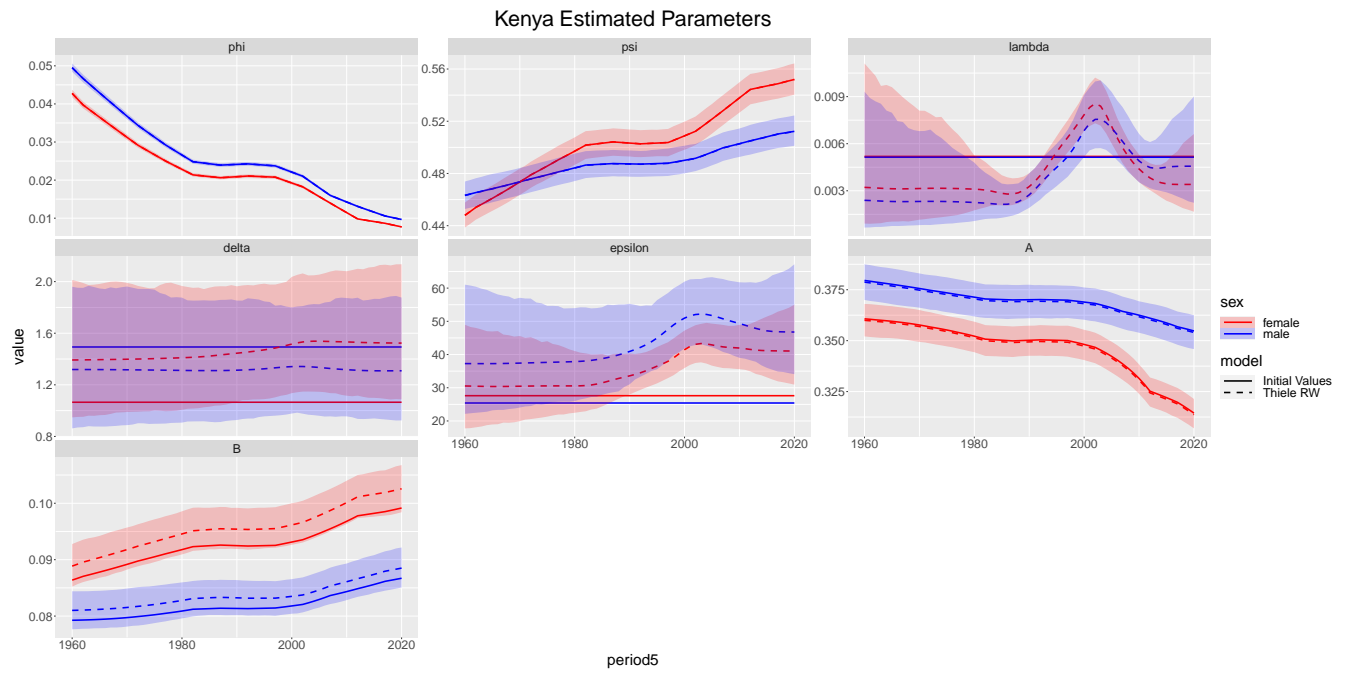
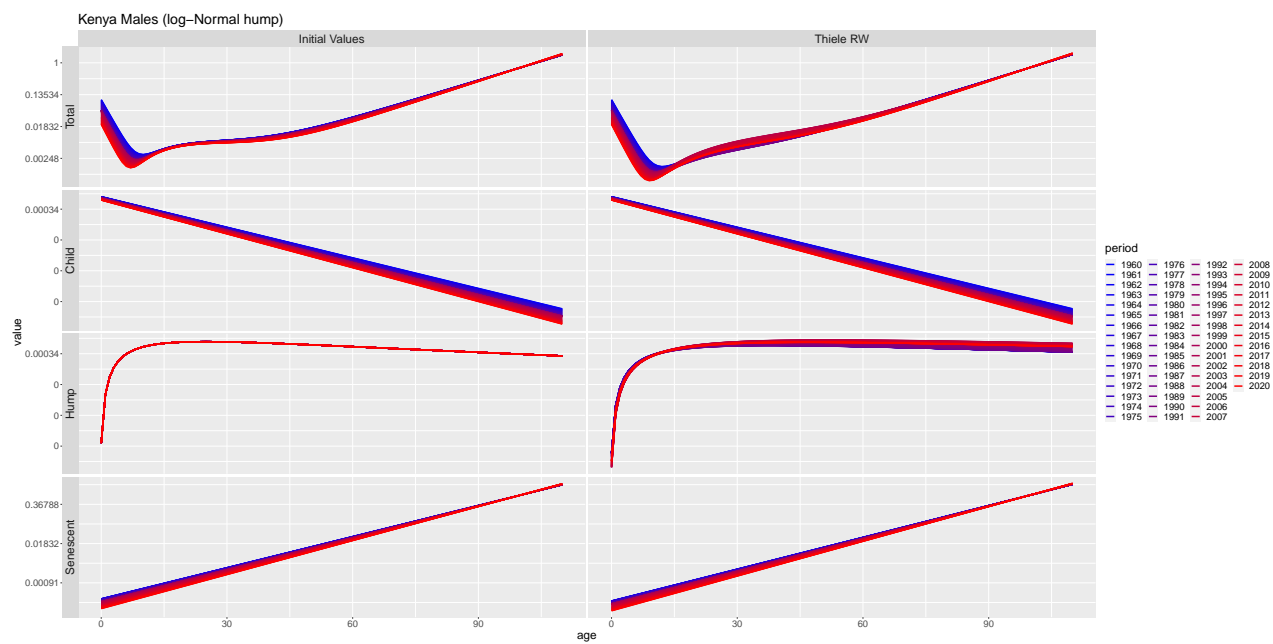Figure 2: Estimated parameters

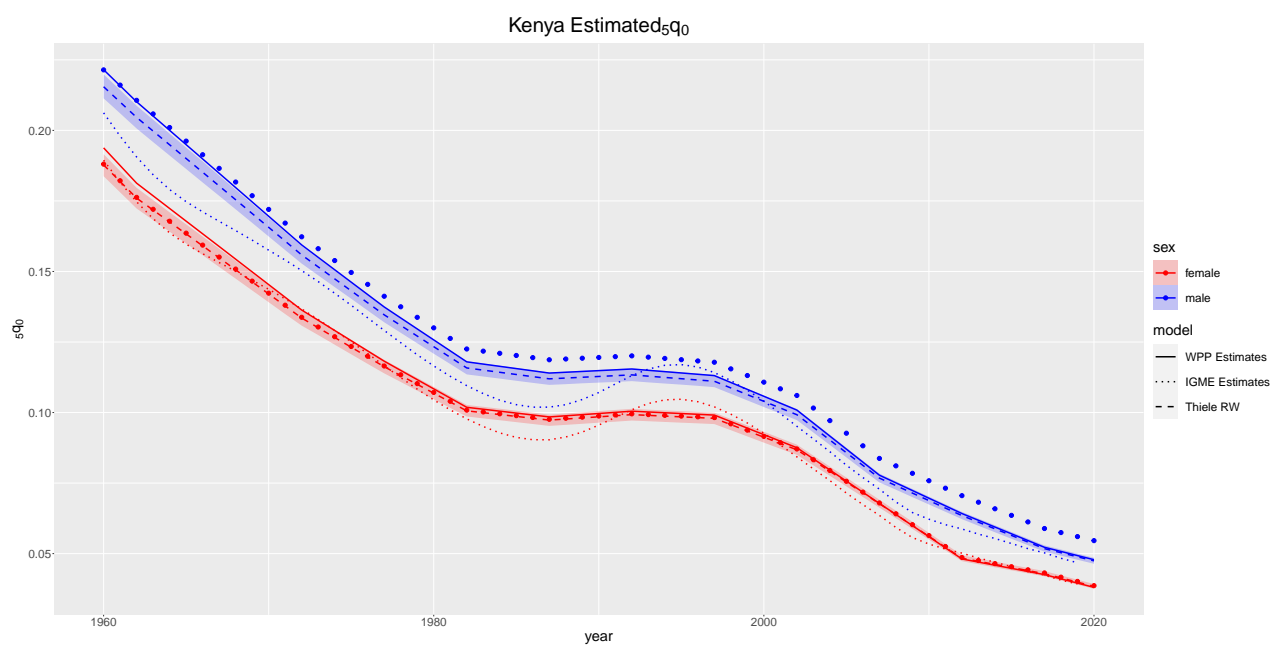Figure 3: Thiele Decomposed

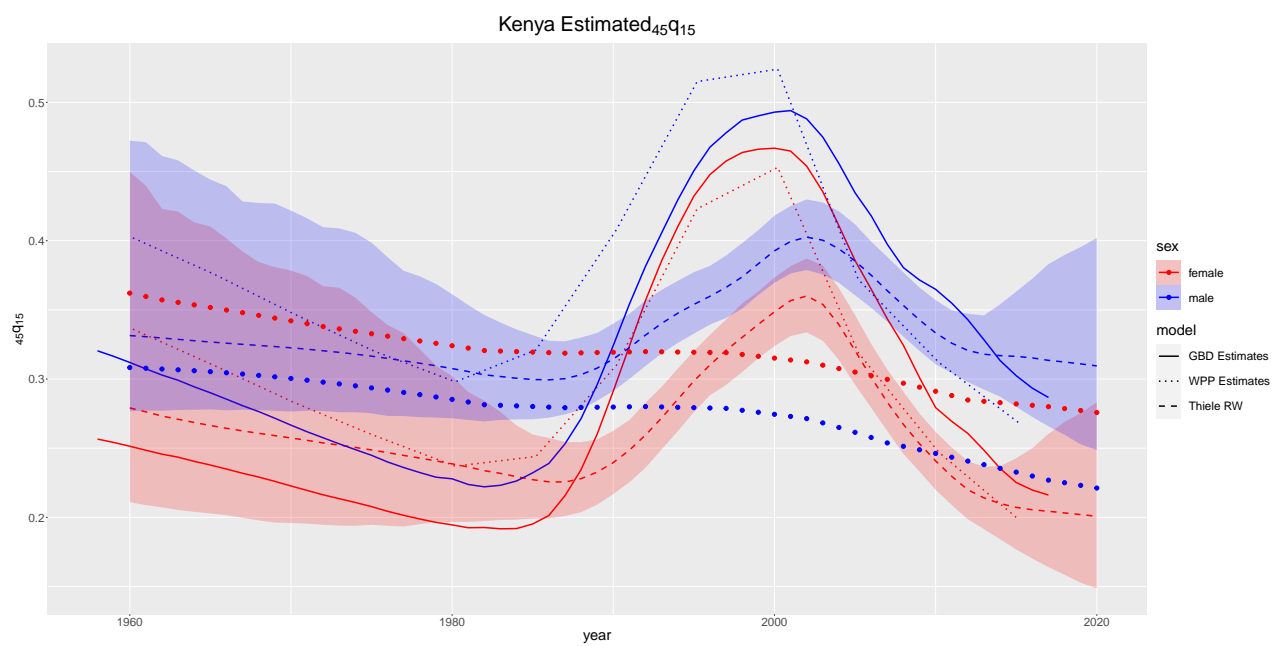Figure 4: Thiele Decomposed

Figure 5: Estimated $_5q_0$

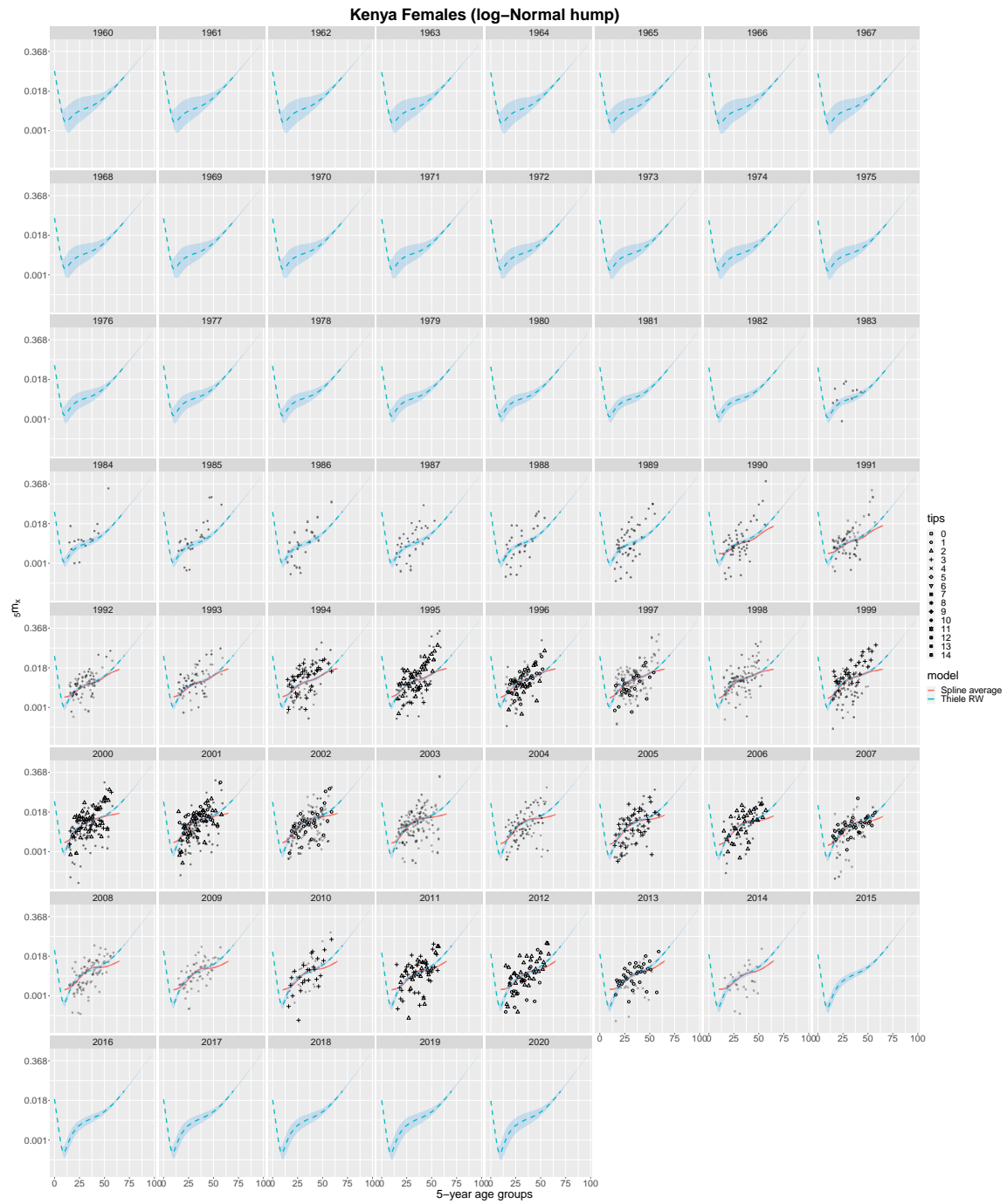Figure 6: Estimated $_{45}q_{15}$

Figure 7: Mortality Schedules
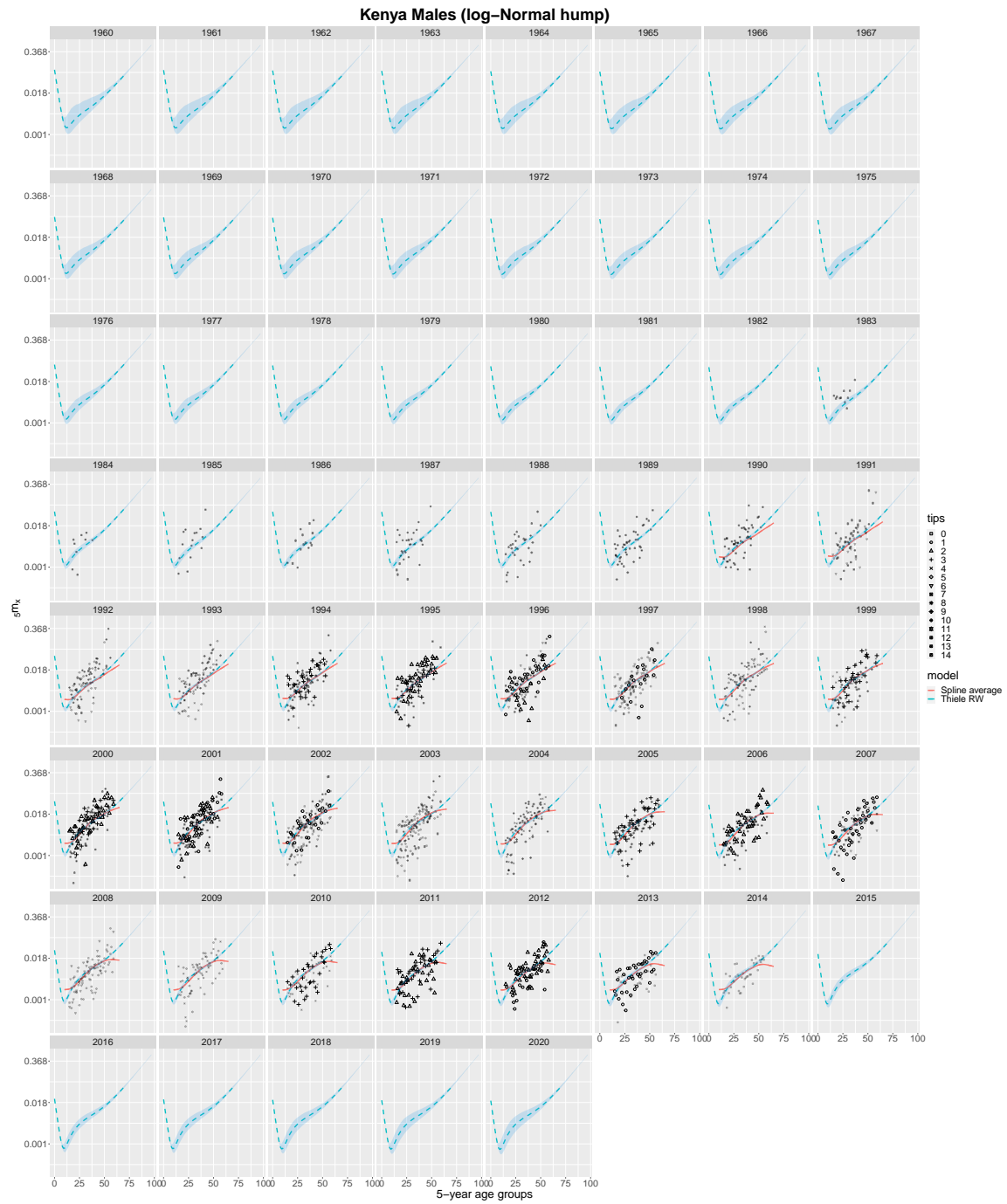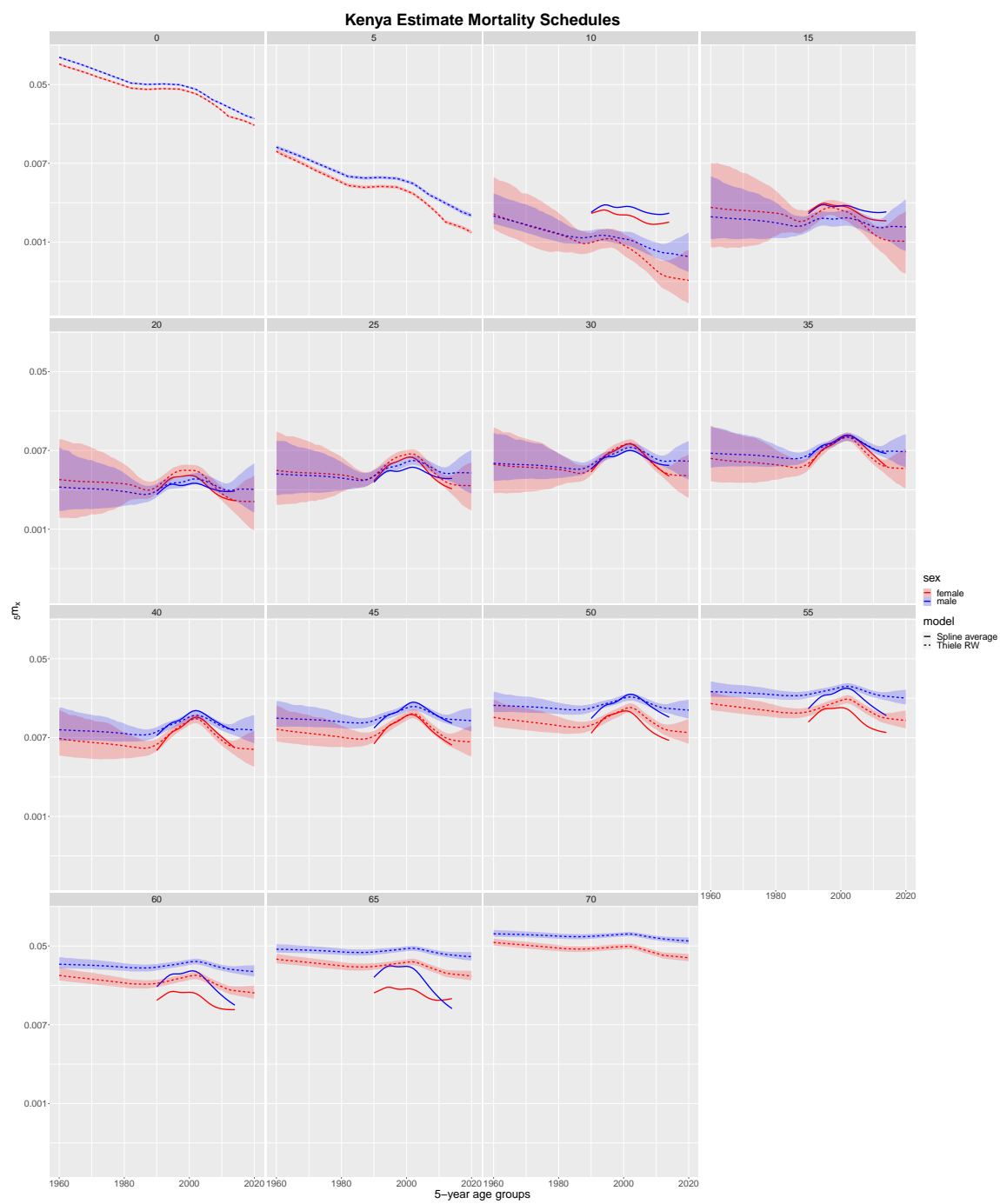
Figure 8: Mortality Schedules
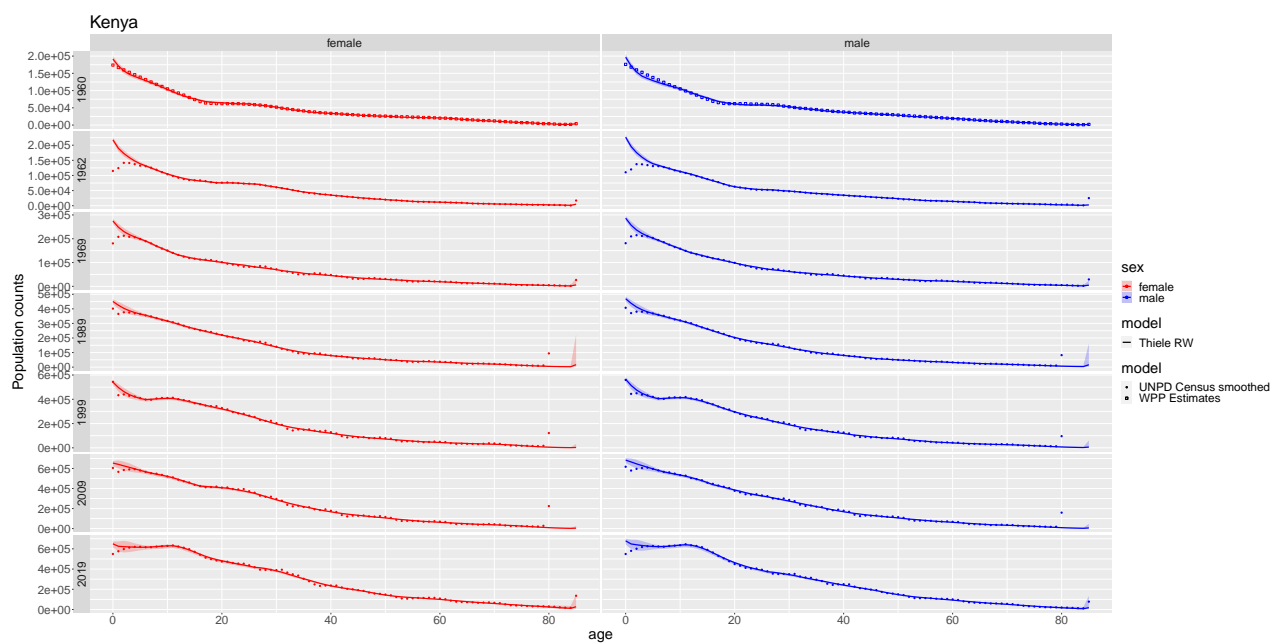
7

Figure 9: Mortality Schedules
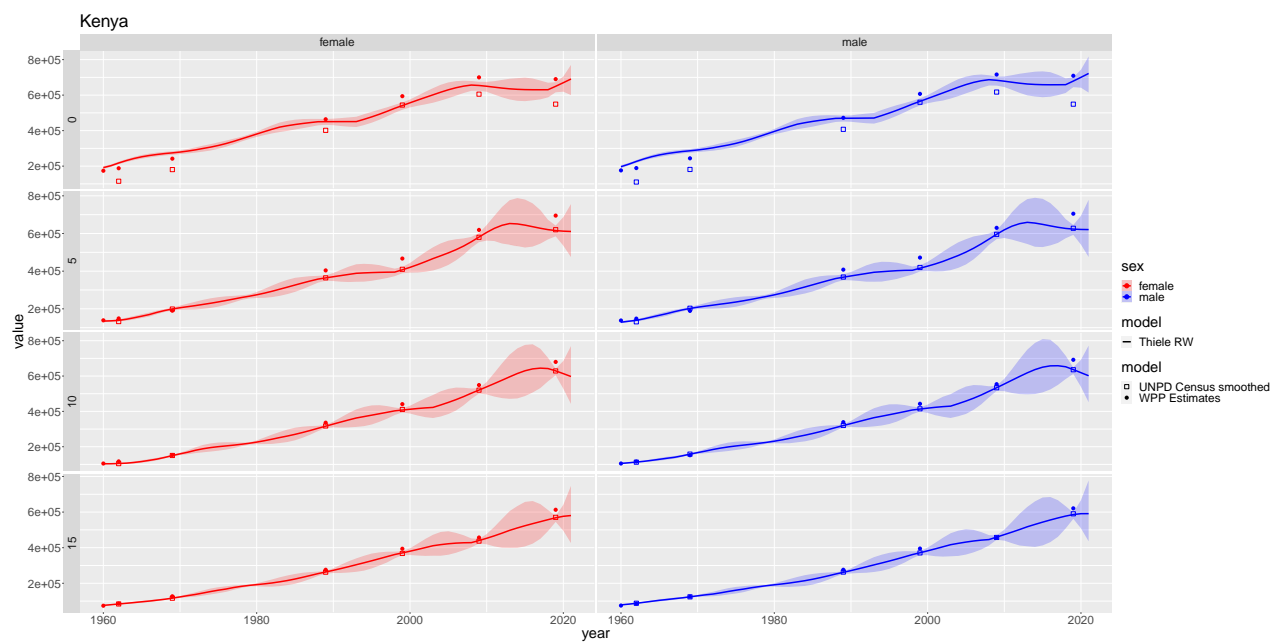
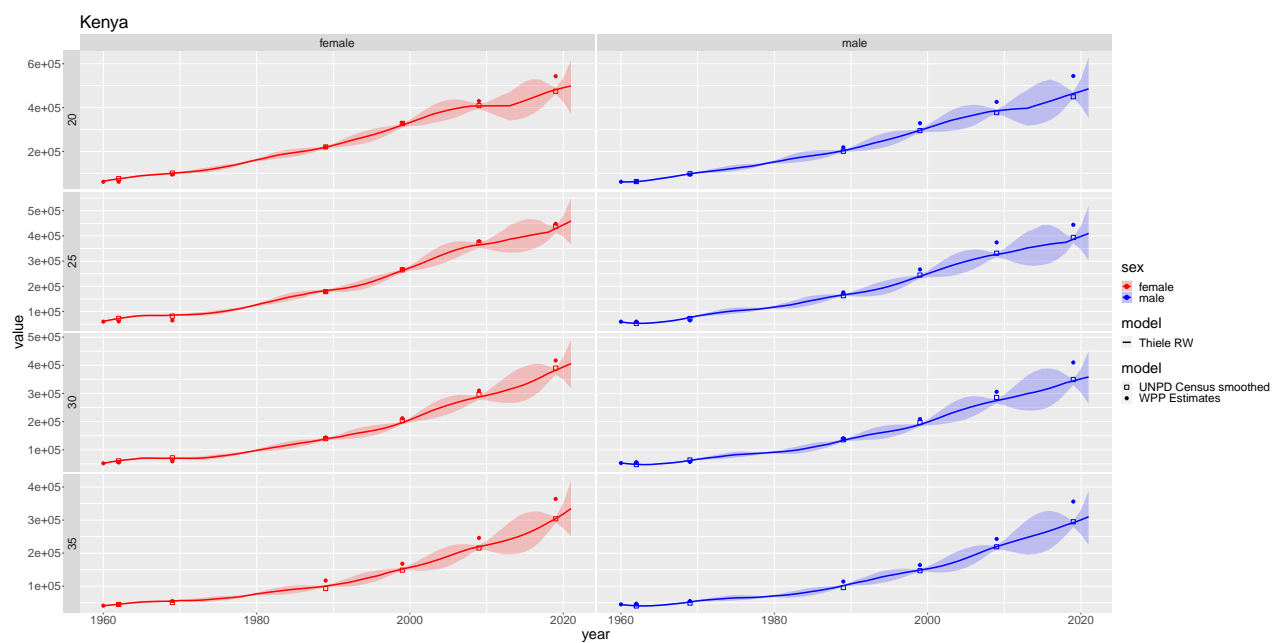Figure 10: Population

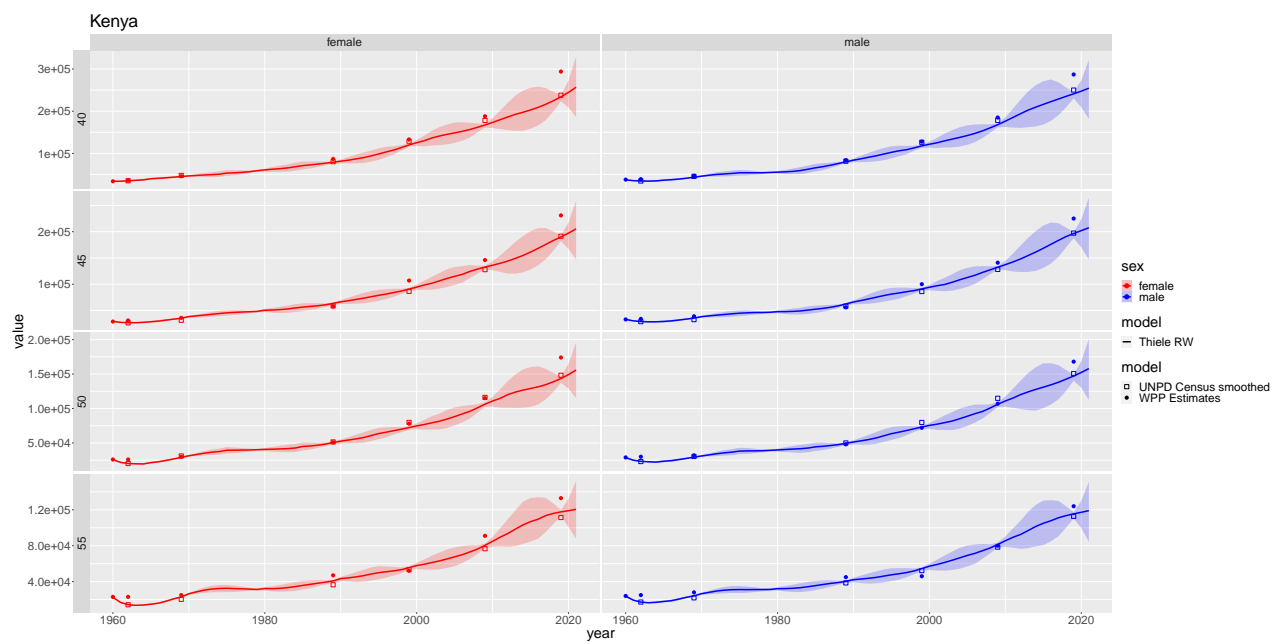

Figure 11: Population

9

Figure 12: Population

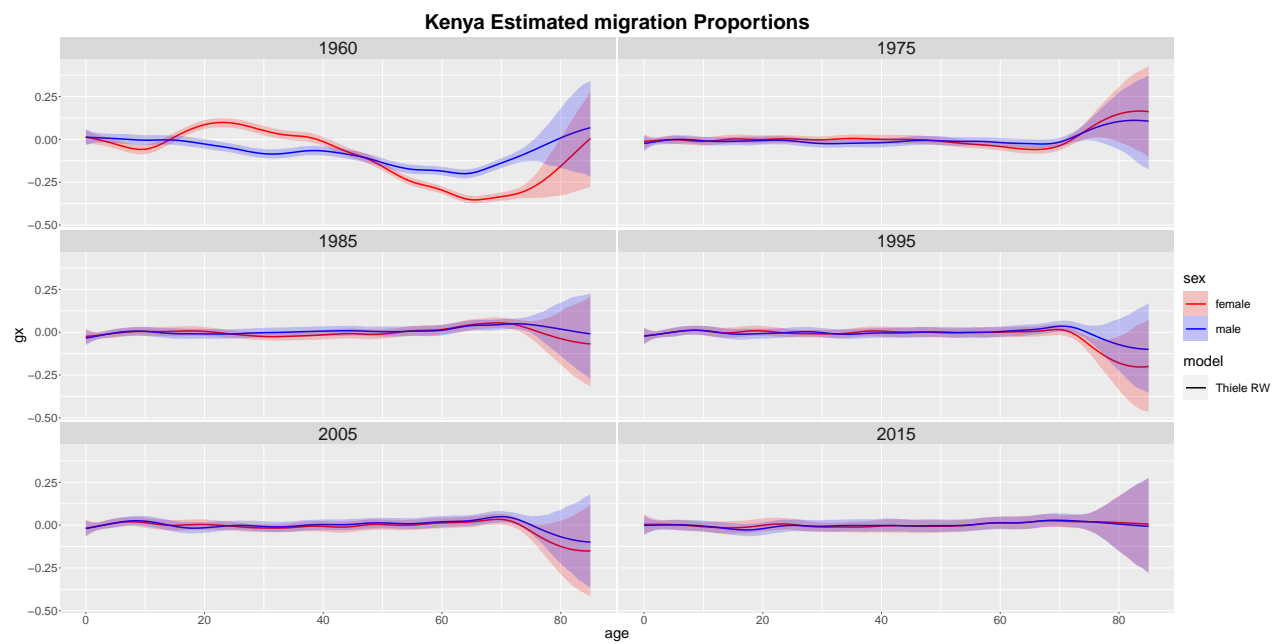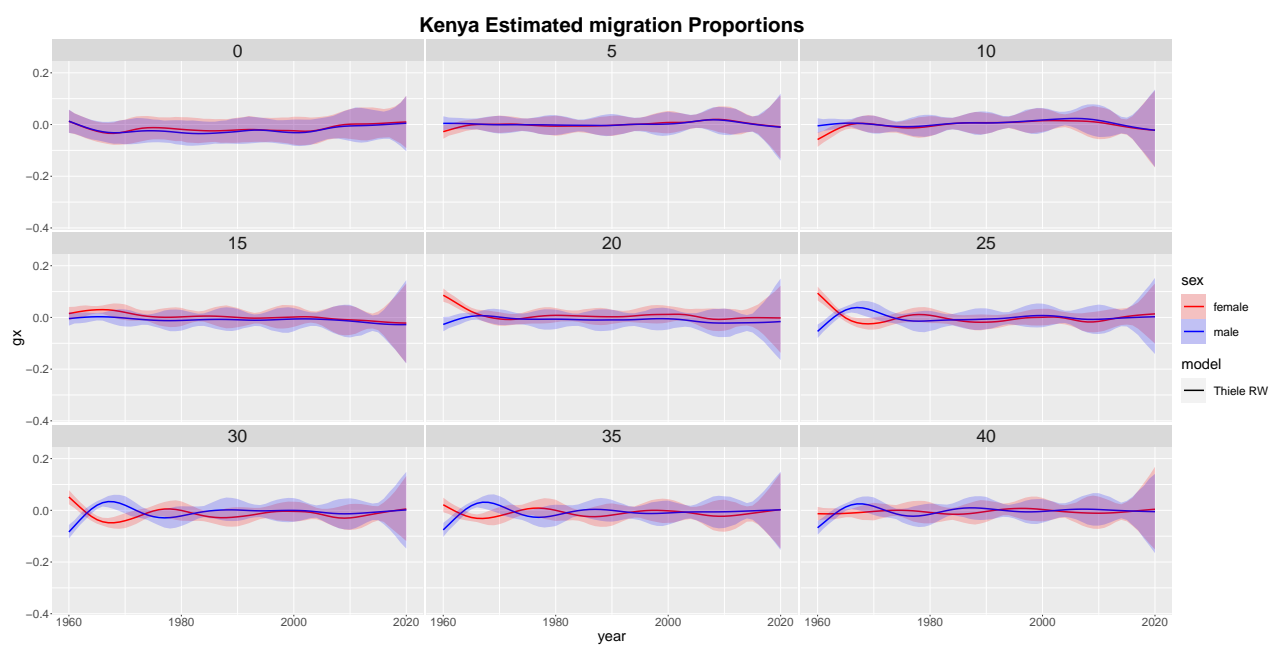Figure 13: Population

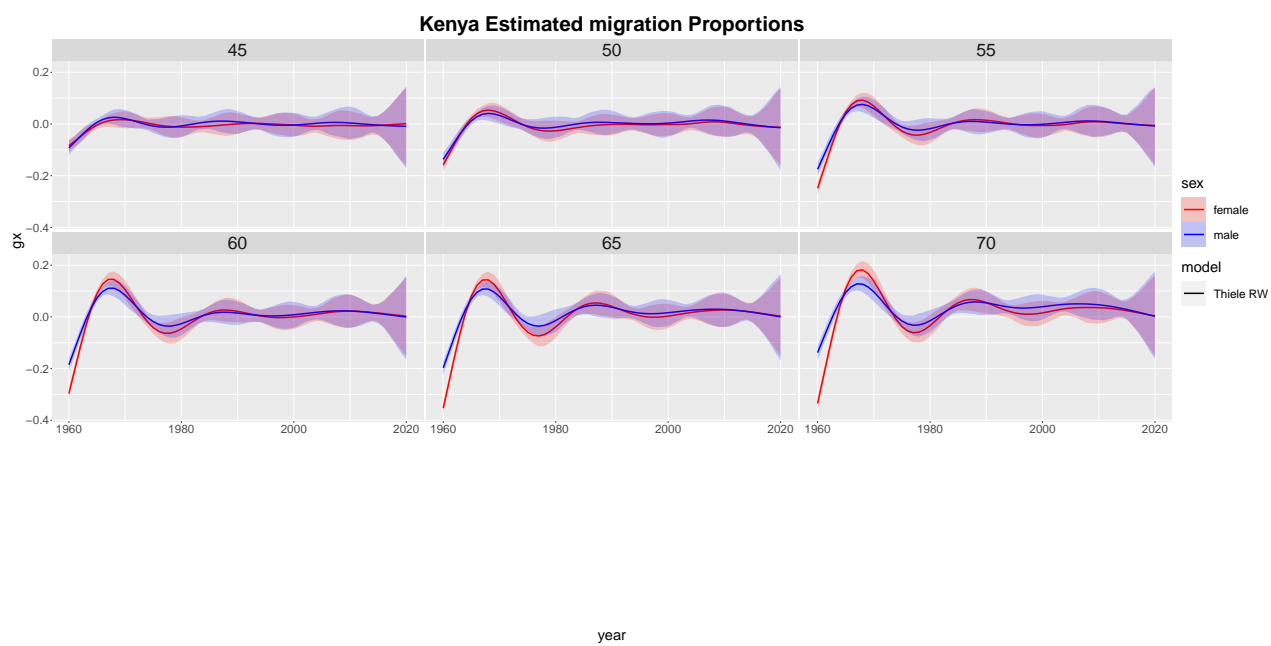Figure 14: Population

Figure 15: Migration

Figure 16: Migration
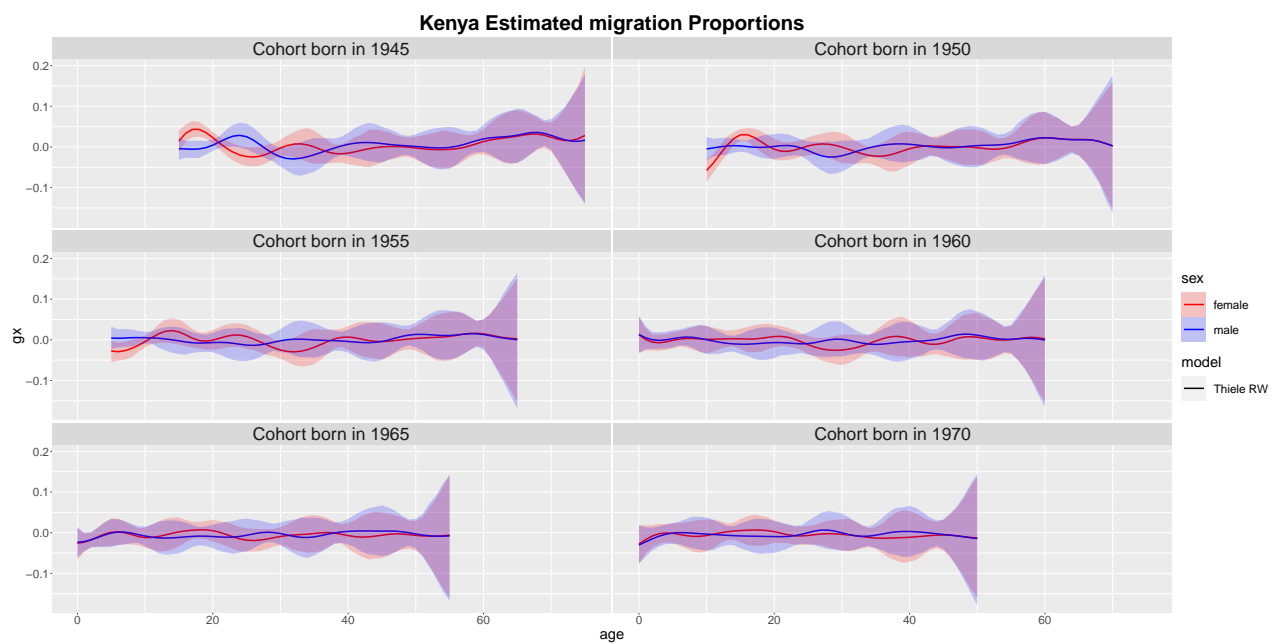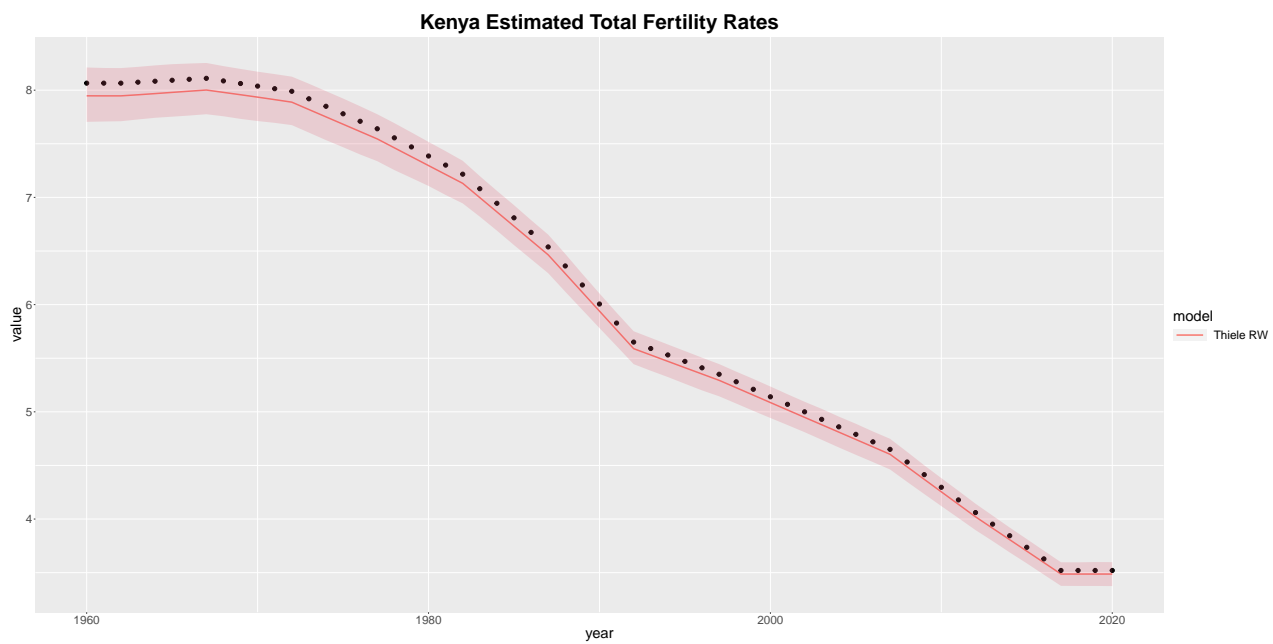

Figure 17: Migration

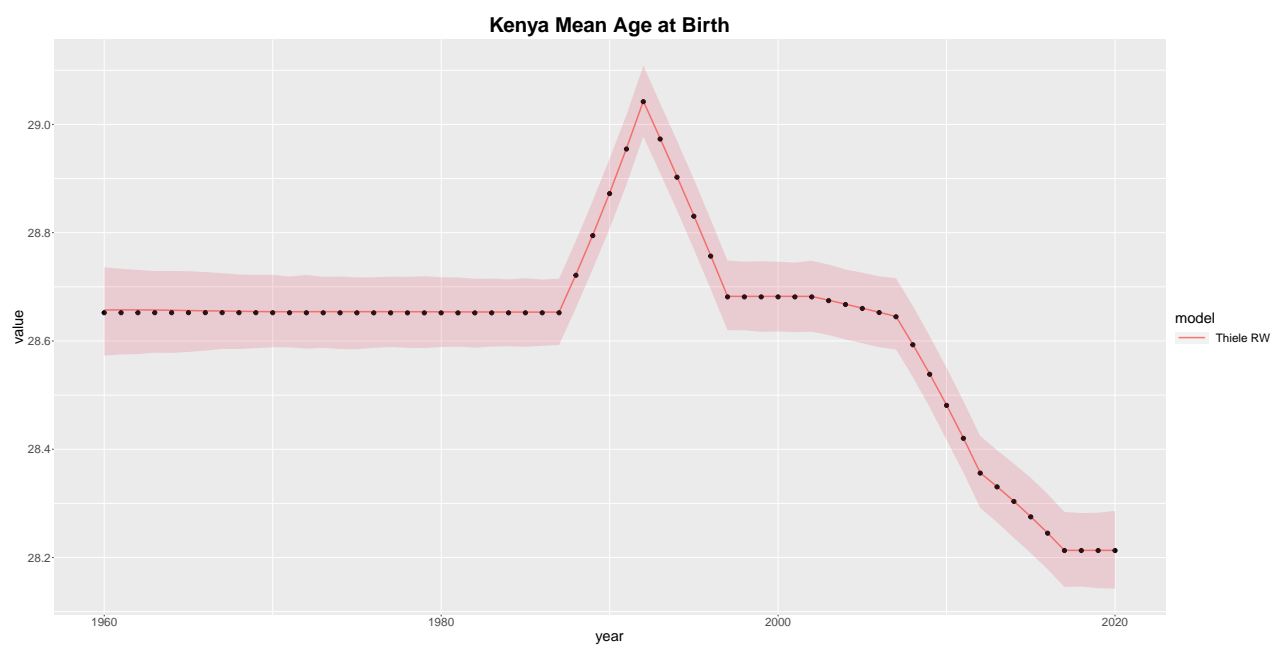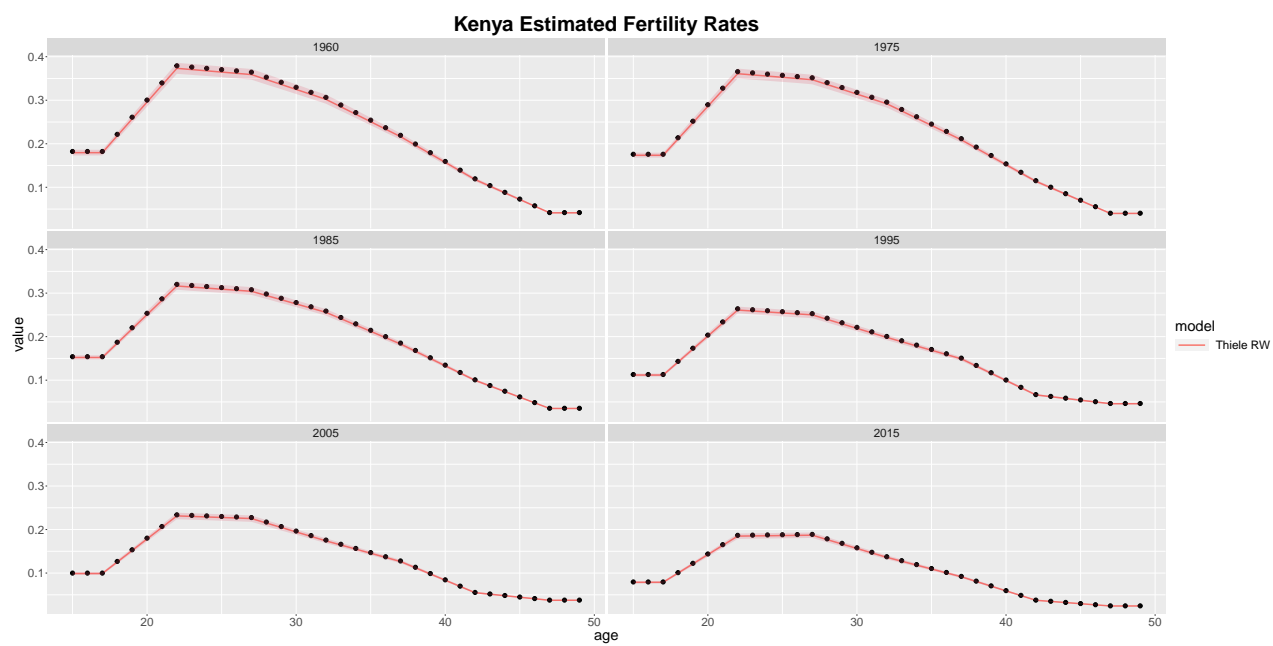Figure 18: Migration

Figure 19: Total Fertility

Figure 20: Mean age at births
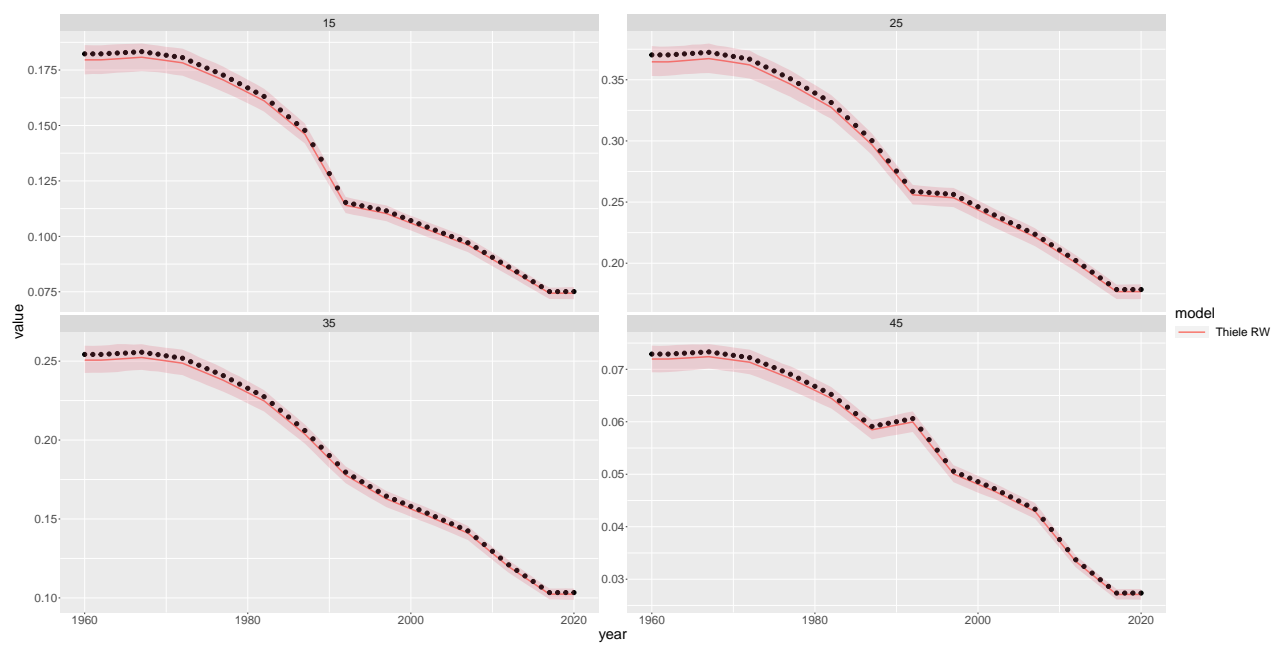

Figure 21: Fertility

Figure 22: Fertility