Eswatini

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

```
## # A tibble: 86 x 6
##      age `1966` `1986` `1997` `2007` `2017`
##    <dbl>  <dbl>  <dbl>  <dbl>  <dbl>  <dbl>
##  1     0  6944. 10944. 12367. 12315. 12763.
##  2     1  6357. 11954. 13136. 12626. 12728.
##  3     2  6575. 12470. 13779. 12892. 13042.
##  4     3  6604. 12747. 14275. 13061. 13357.
##  5     4  6672. 12586. 14505. 13161. 13400.
##  6     5  6486. 12067. 14554. 13360. 13192.
##  7     6  6317. 11477. 14321. 13773. 12860.
##  8     7  6154. 10918. 14076. 13918. 12767.
##  9     8  5920. 10495. 14030. 13731. 13024.
## 10     9  5653. 10157. 14008. 13749. 13262.
## # ... with 76 more rows
```

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

```
## # A tibble: 86 x 2
##      age `1976`
##    <dbl>  <dbl>
##  1     0  9124.
##  2     1  9209.
##  3     2  9166.
##  4     3  8996.
##  5     4  8697.
##  6     5  8411.
##  7     6  8210.
##  8     7  7990.
##  9     8  7753.
## 10     9  7497.
## # ... with 76 more rows
```

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

```
## # A tibble: 86 x 6
##      age `1966` `1986` `1997` `2007` `2017`
##    <dbl>  <dbl>  <dbl>  <dbl>  <dbl>  <dbl>
##  1     0  6493. 10189. 12041. 12068. 12844.
##  2     1  5923. 11653. 12881. 12629. 12882.
##  3     2  6173. 12185. 13537. 12900. 13180.
##  4     3  6269. 12512. 14039. 12998. 13354.
##  5     4  6391. 12329. 14261. 12995. 13401.
##  6     5  6282. 11800. 14302. 13213. 13389.
##  7     6  6171. 11207. 14133. 13829. 13195.
##  8     7  6014. 10632. 13814. 14021. 12997.
##  9     8  5795. 10233. 13708. 13600. 12957.
## 10     9  5527.  9948. 13648. 13429. 13045.
## # ... with 76 more rows
```

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

```
## # A tibble: 86 x 2
##      age `1976`
##    <dbl>  <dbl>
##  1     0  8654.
##  2     1  8714.
##  3     2  8684.
##  4     3  8564.
##  5     4  8354.
##  6     5  8185.
##  7     6  8076.
##  8     7  7906.
##  9     8  7673.
## 10     9  7378.
## # ... with 76 more rows
```

Thiele log-Normal Hump Spline

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

```
##             log_tau2_logpop             log_tau2_logpop
##                  -1.10785159                  6.76090216
##             log_tau2_logpop             log_tau2_logpop
##                  -0.09082651                  6.81104099
##      log_marginal_lambda_fx      log_marginal_lambda_gx
##                   5.66720638                  7.50148780
##              log_dispersion              log_dispersion
##                   1.93849721                  1.58040282
##     log_marginal_lambda_phi     log_marginal_lambda_psi
##                   8.65496859                  8.63508576
##  log_marginal_lambda_lambda   log_marginal_lambda_delta
##                   0.44022037                  1.30888749
## log_marginal_lambda_epsilon      log_marginal_lambda_A
##                   2.54721121                  8.58471379
##       log_marginal_lambda_B              logit_rho_phi
##                   8.75629597                 -1.65745346
##               logit_rho_psi            logit_rho_lambda
##                  -1.65744649                  1.51228221
##             logit_rho_delta           logit_rho_epsilon
##                   1.39834470                  2.29066503
##                logit_rho_A                 logit_rho_B
##                  -1.65726113                 -1.66363946
##            logit_rho_fx_age           logit_rho_fx_time
##                  -1.60151670                 -2.54832933
##            logit_rho_gx_age           logit_rho_gx_time
##                  -1.64603650                  2.64840757
```

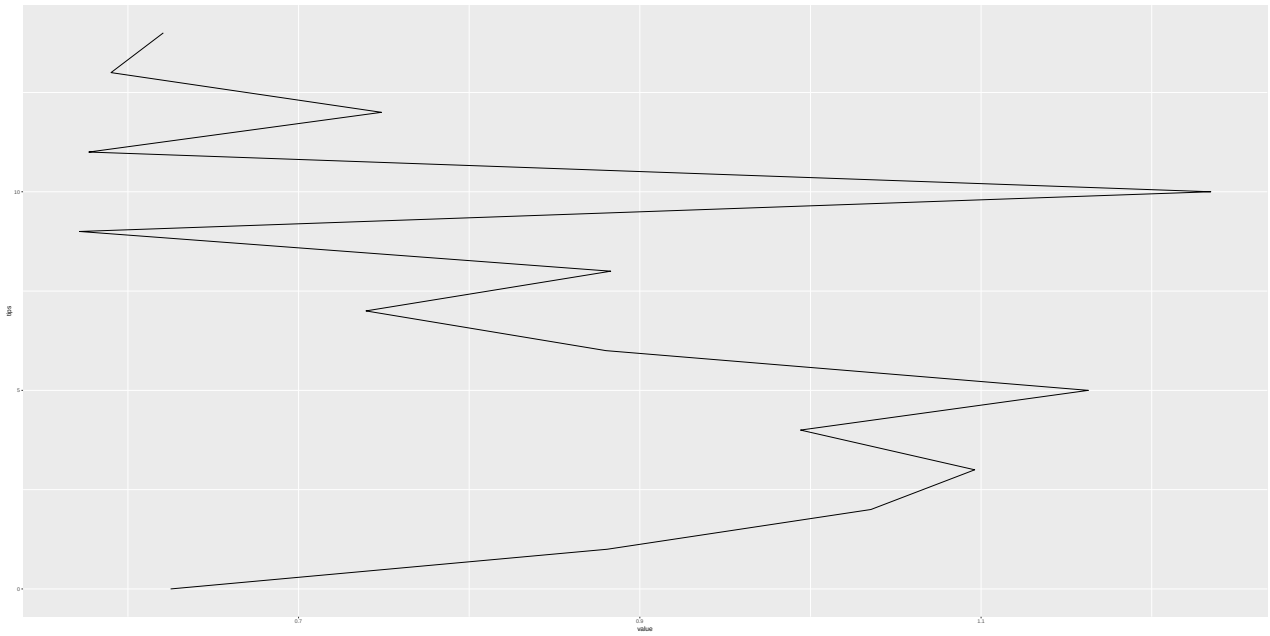

Figure 1: Estimated TiPS

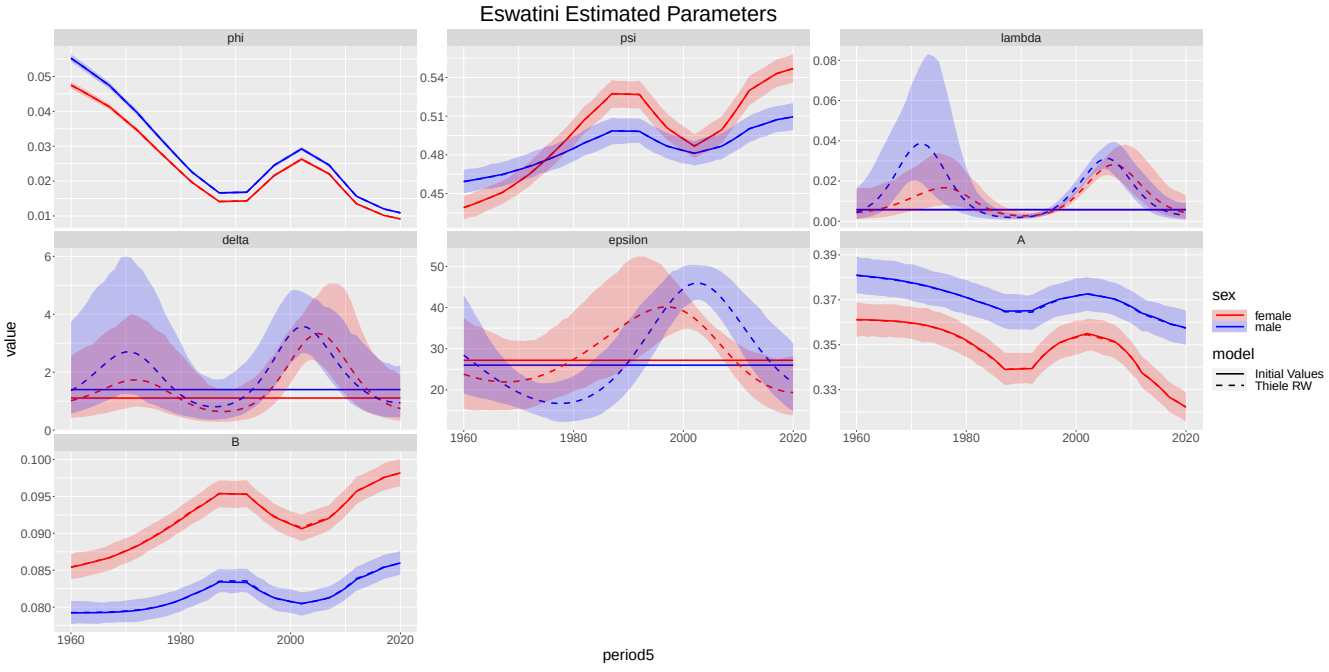

Figure 2: Estimated parameters

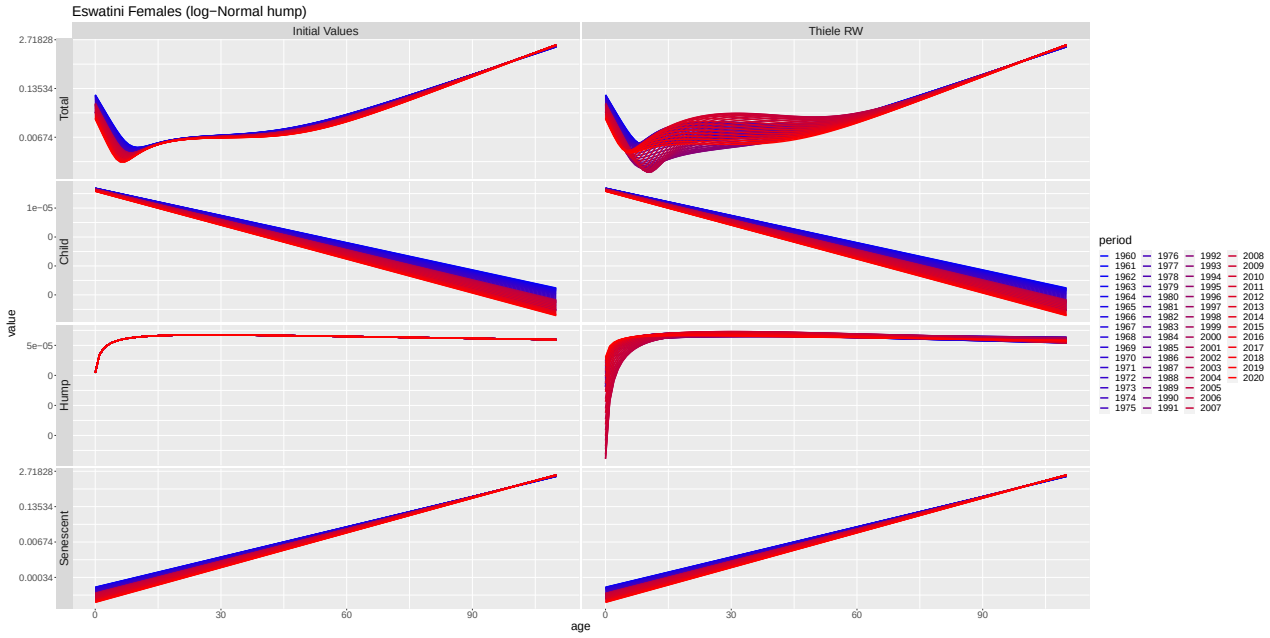

Figure 3: Thiele Decomposed

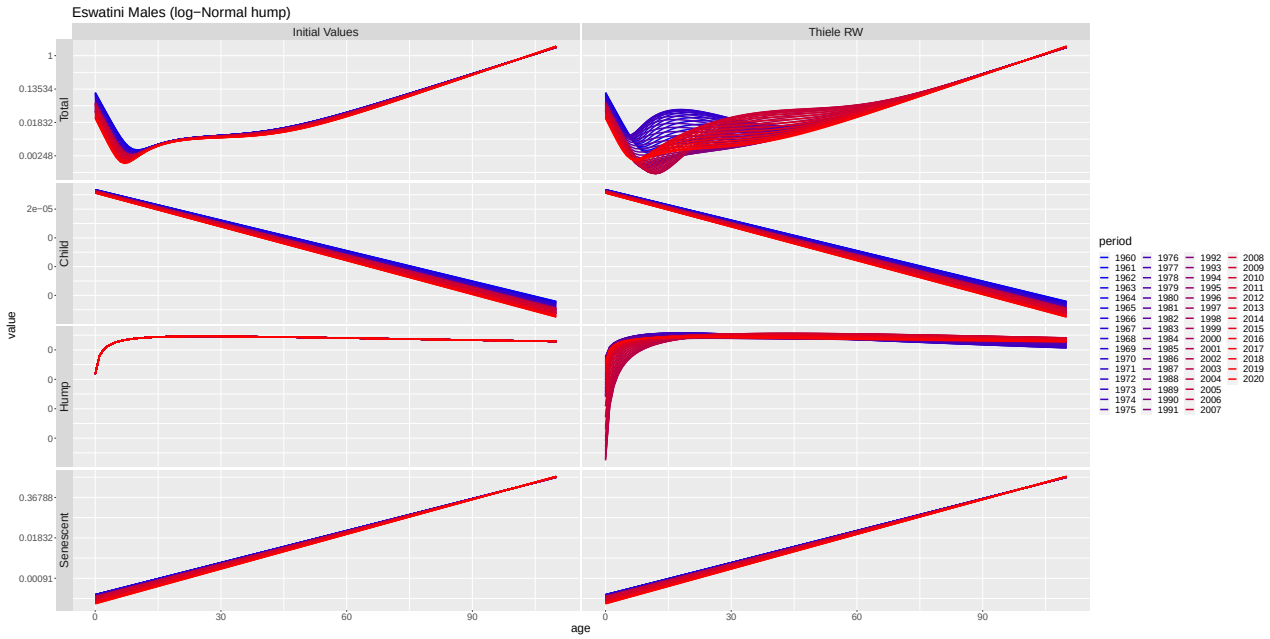

Figure 4: Thiele Decomposed

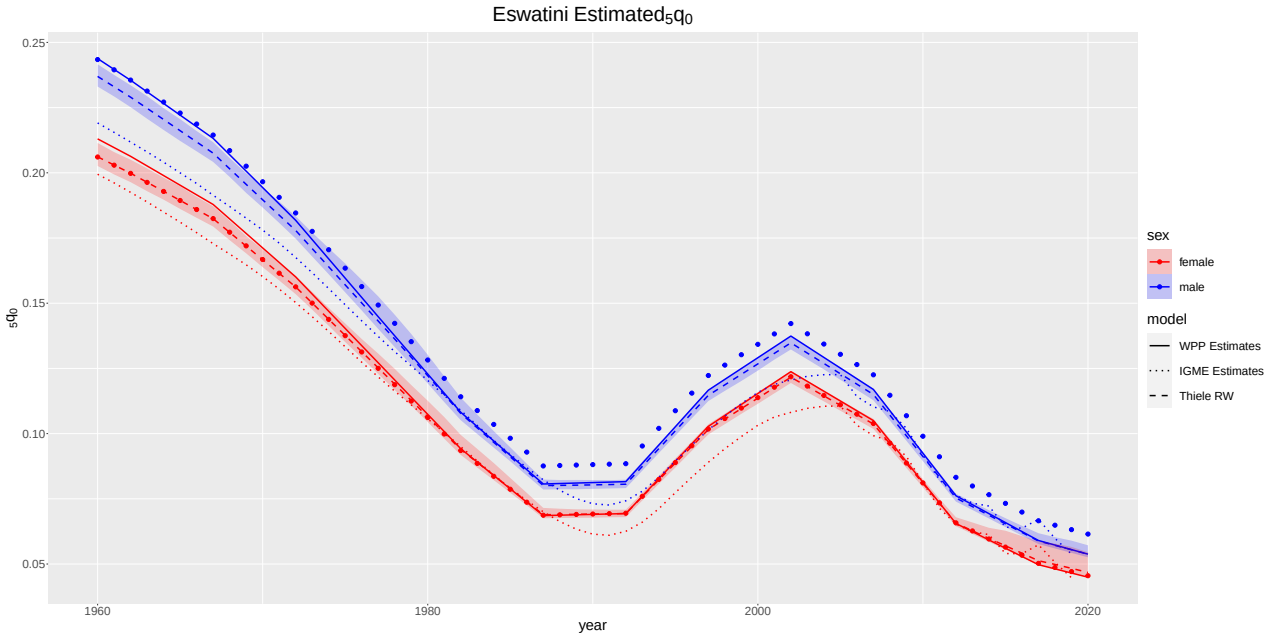

Figure 5: Estimated ${}_5q_0$

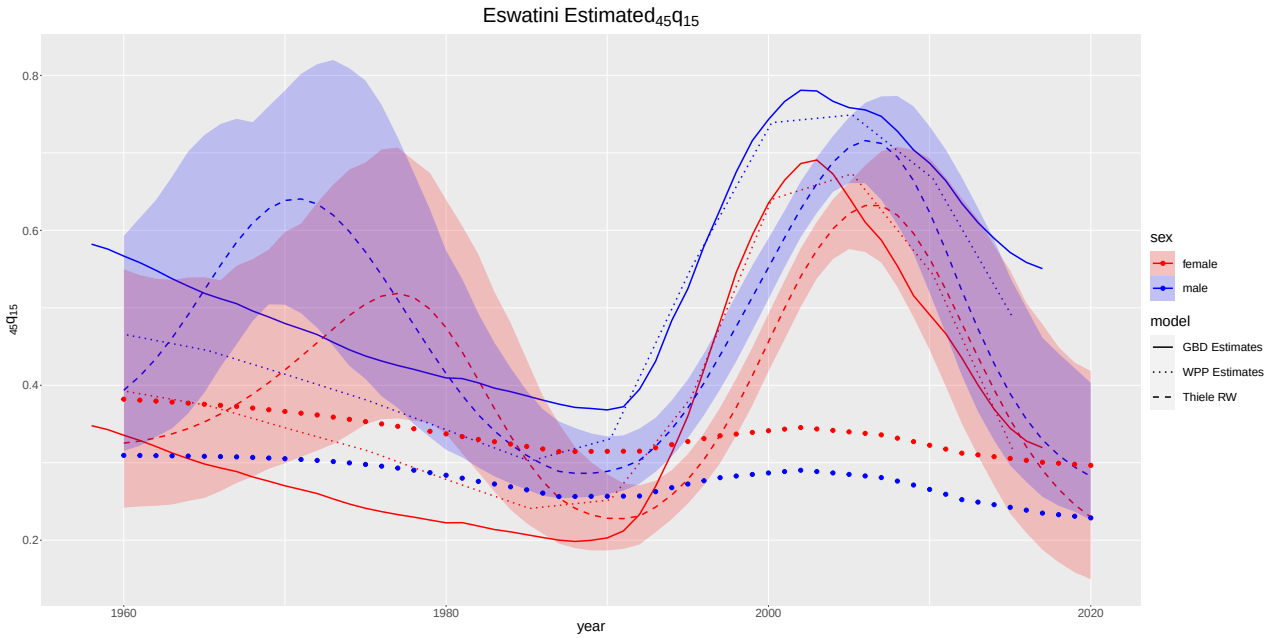

Figure 6: Estimated ${}_{45}q_{15}$

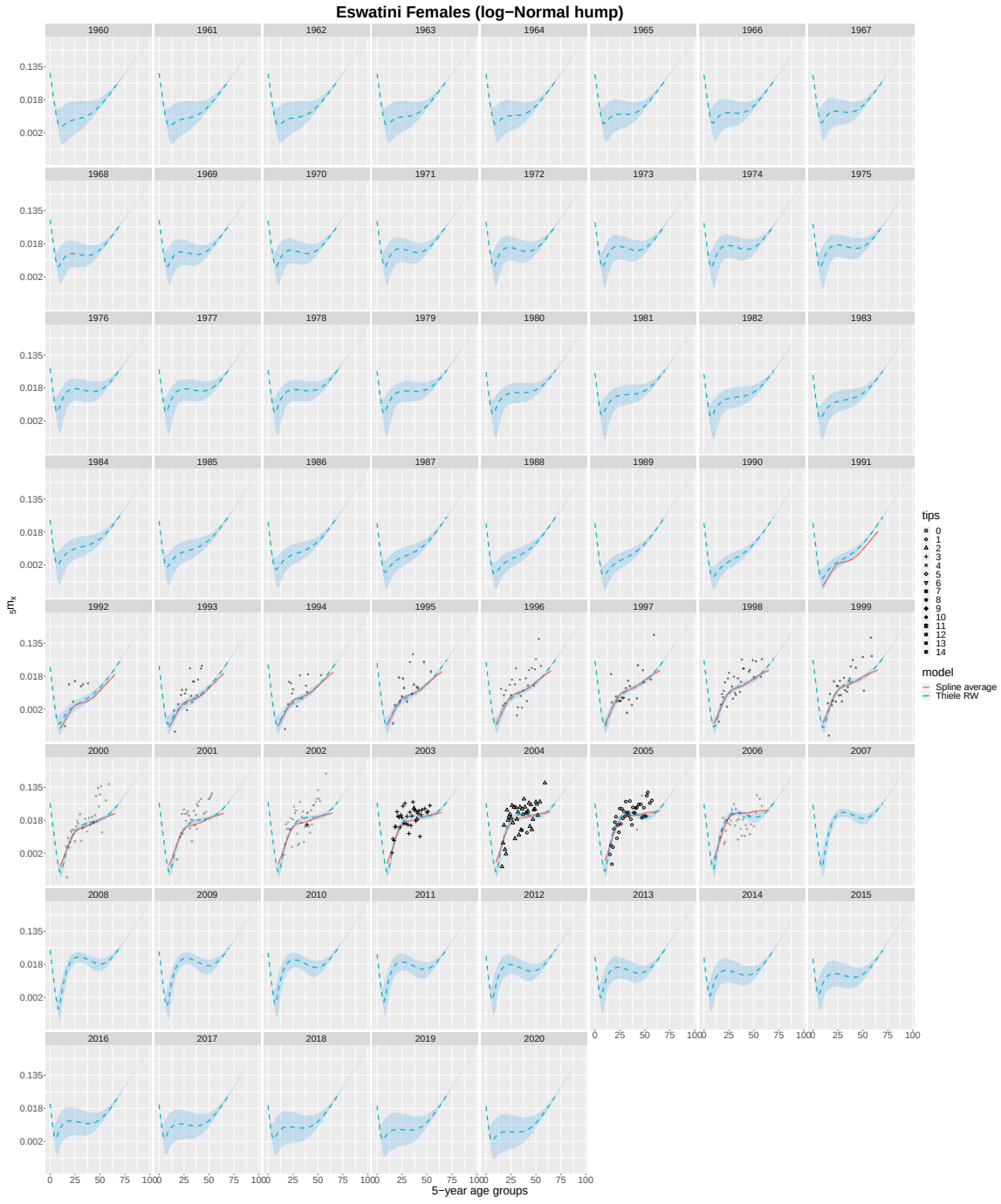

Figure 7: Mortality Schedules

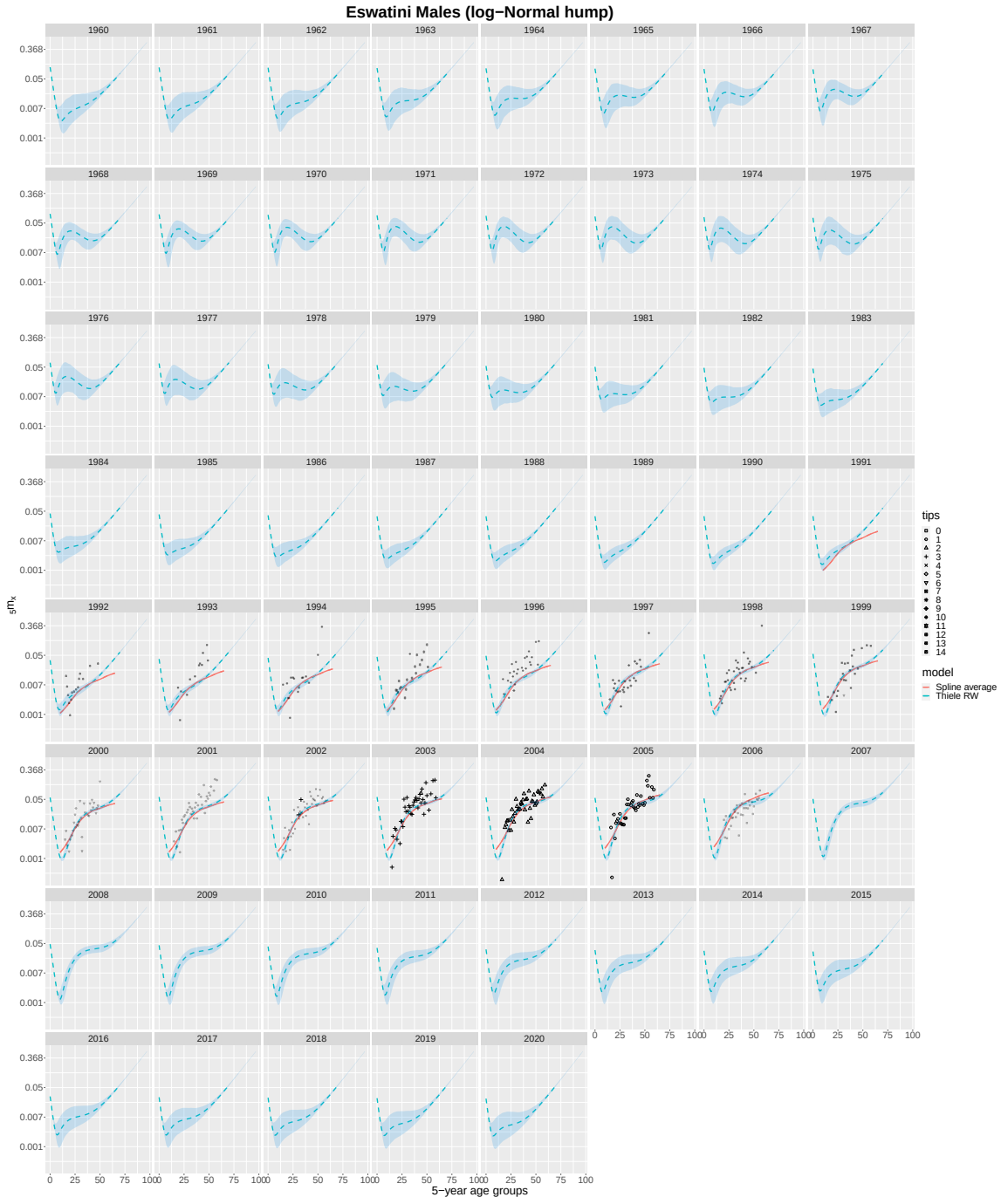

Figure 8: Mortality Schedules

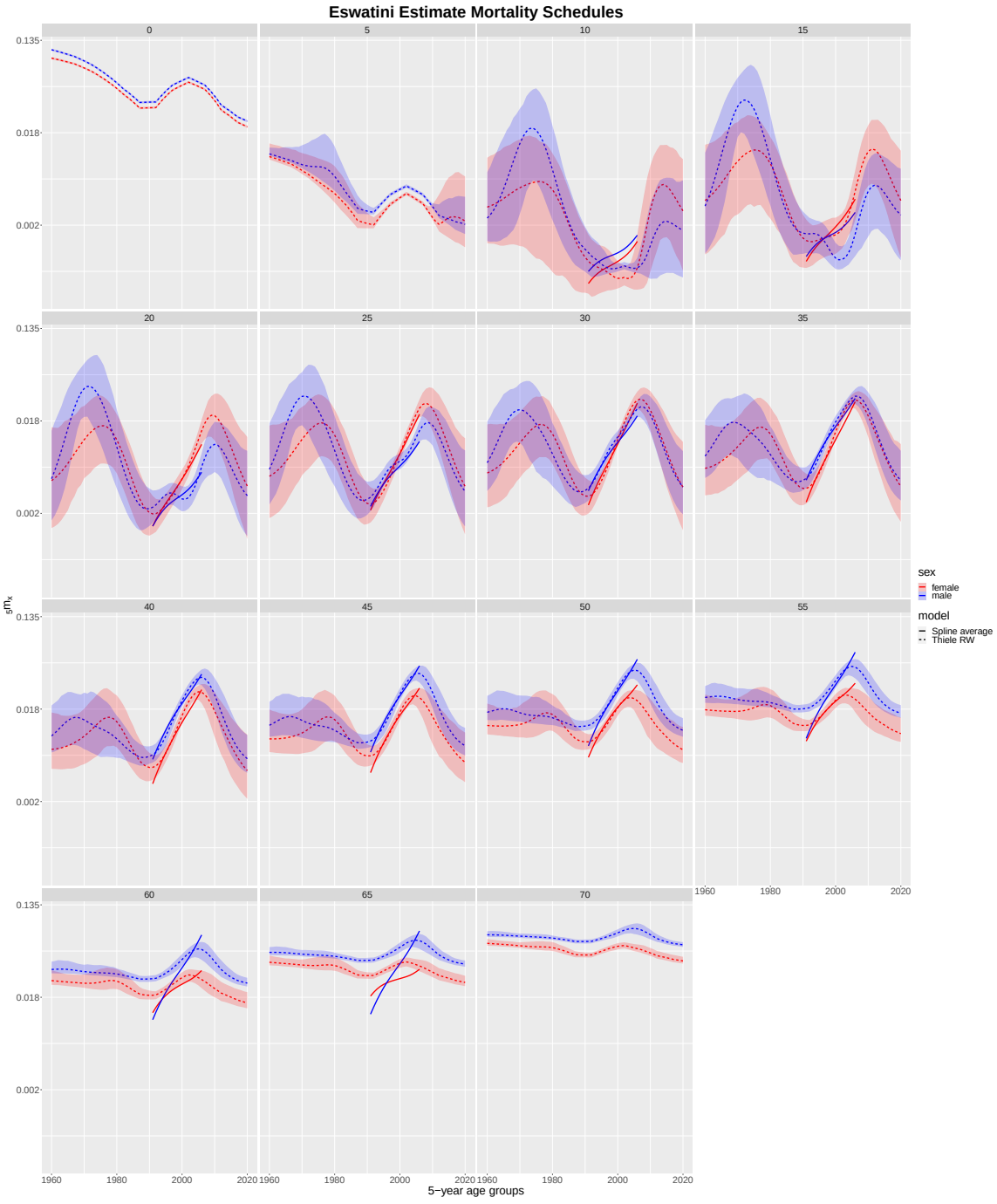

Figure 9: Mortality Schedules

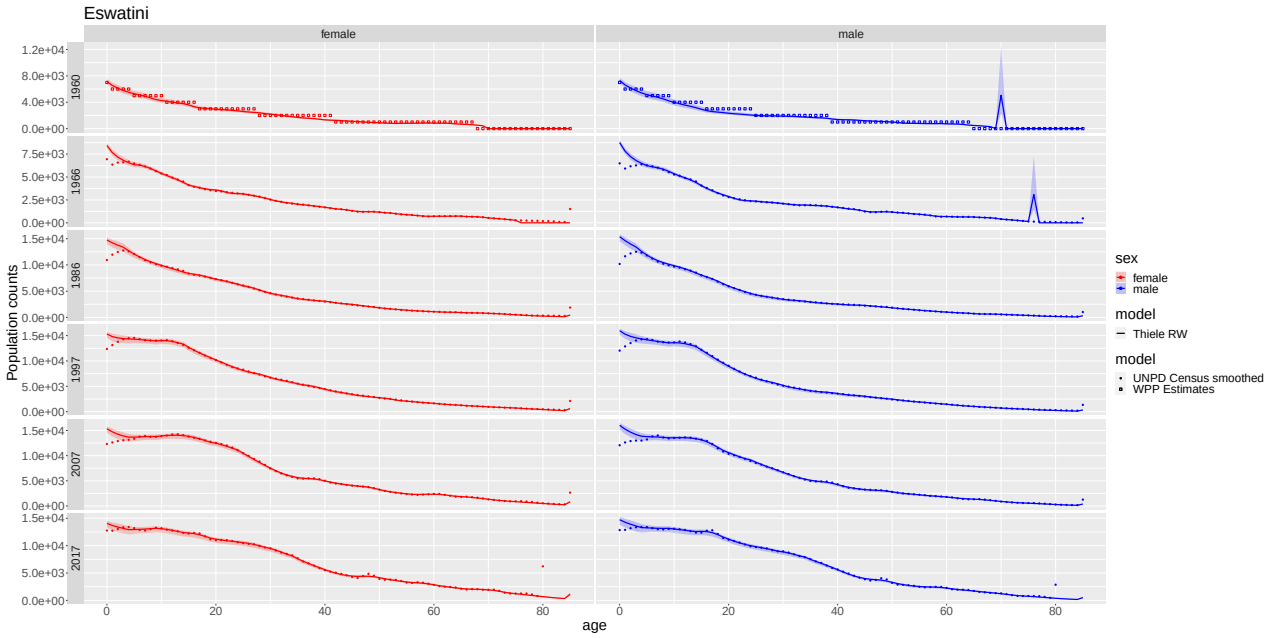

Figure 10: Population

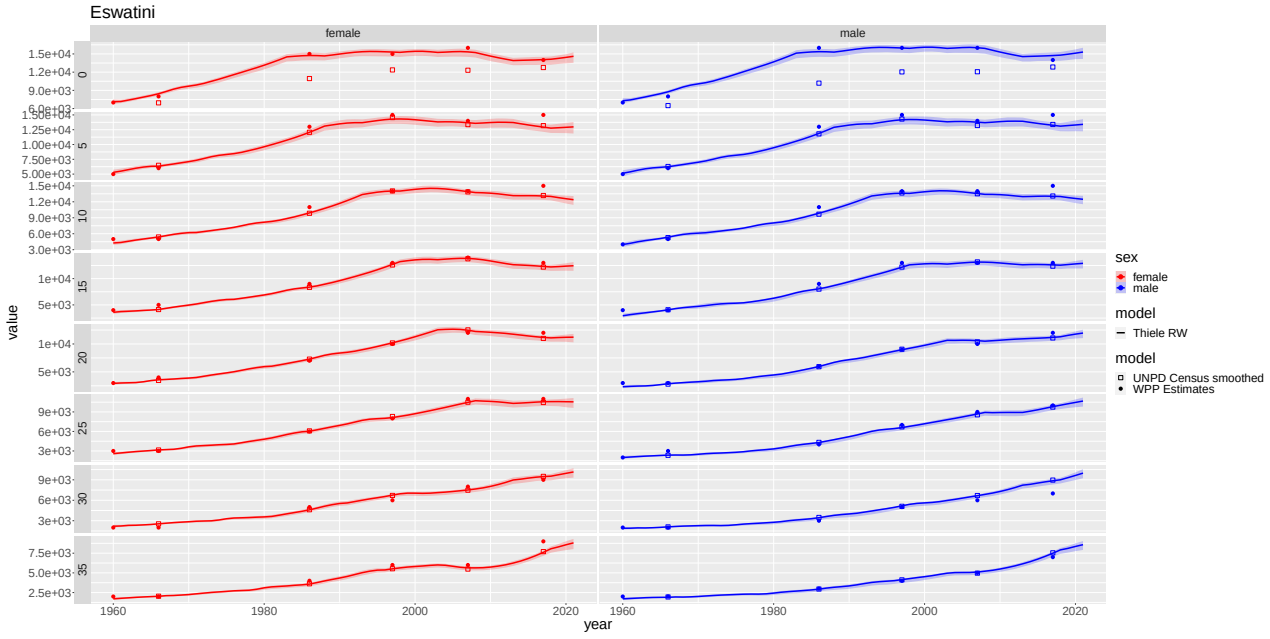

Figure 11: Population

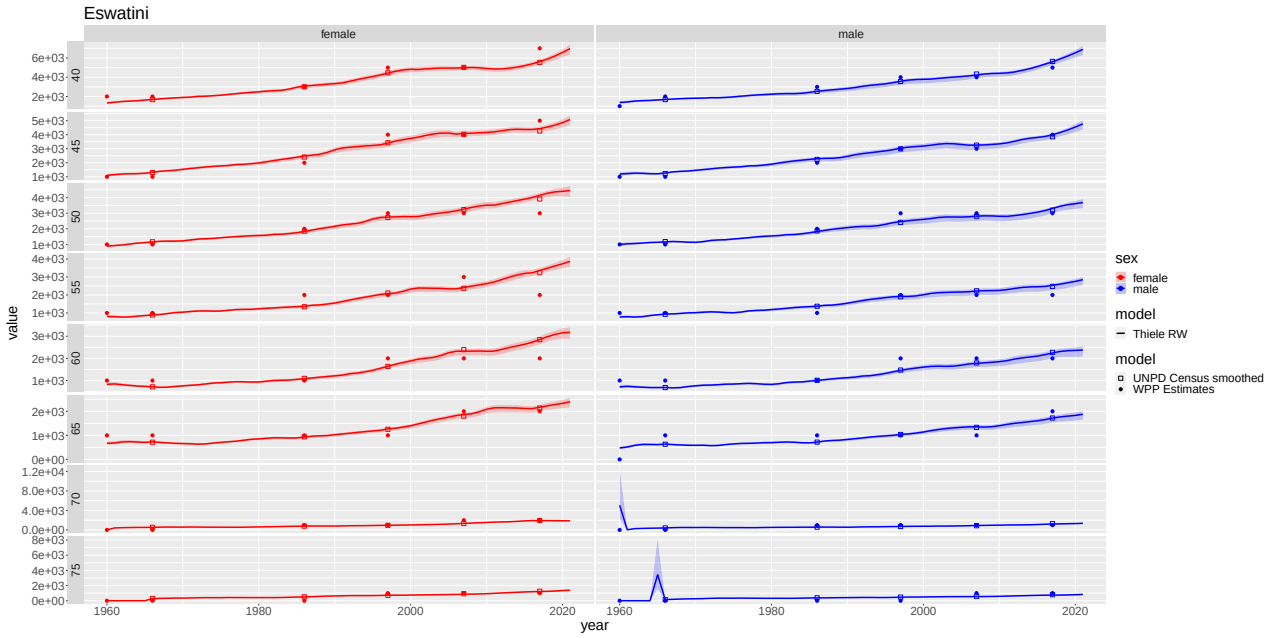

Figure 12: Population

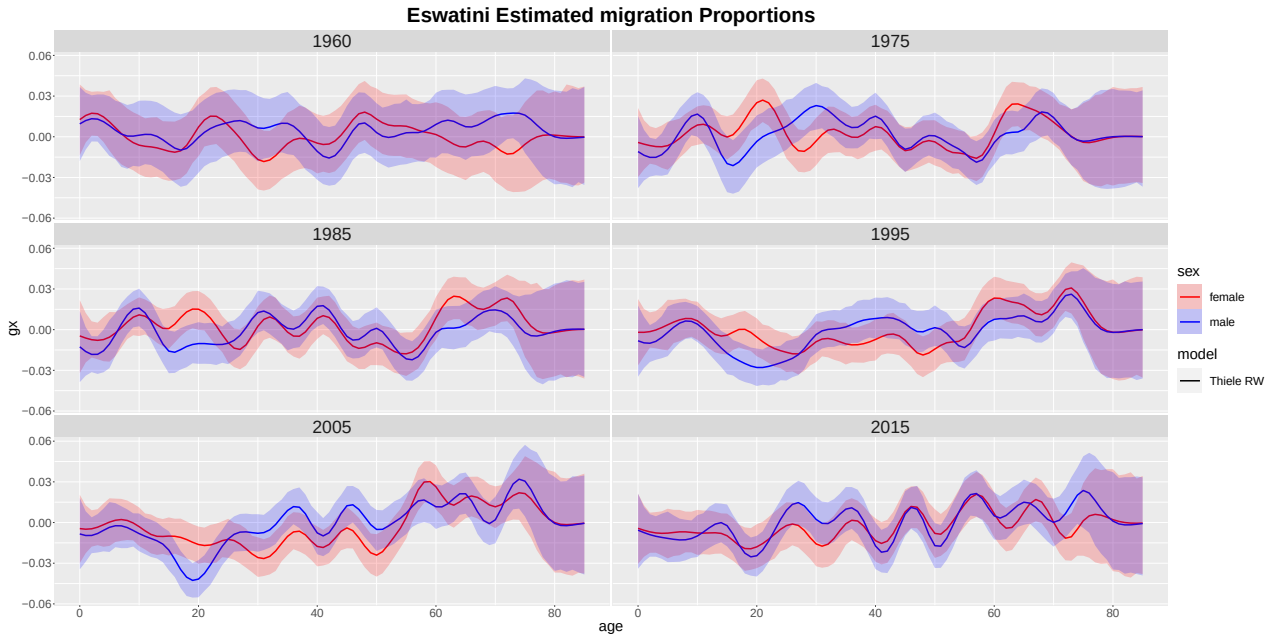

Figure 13: Migration

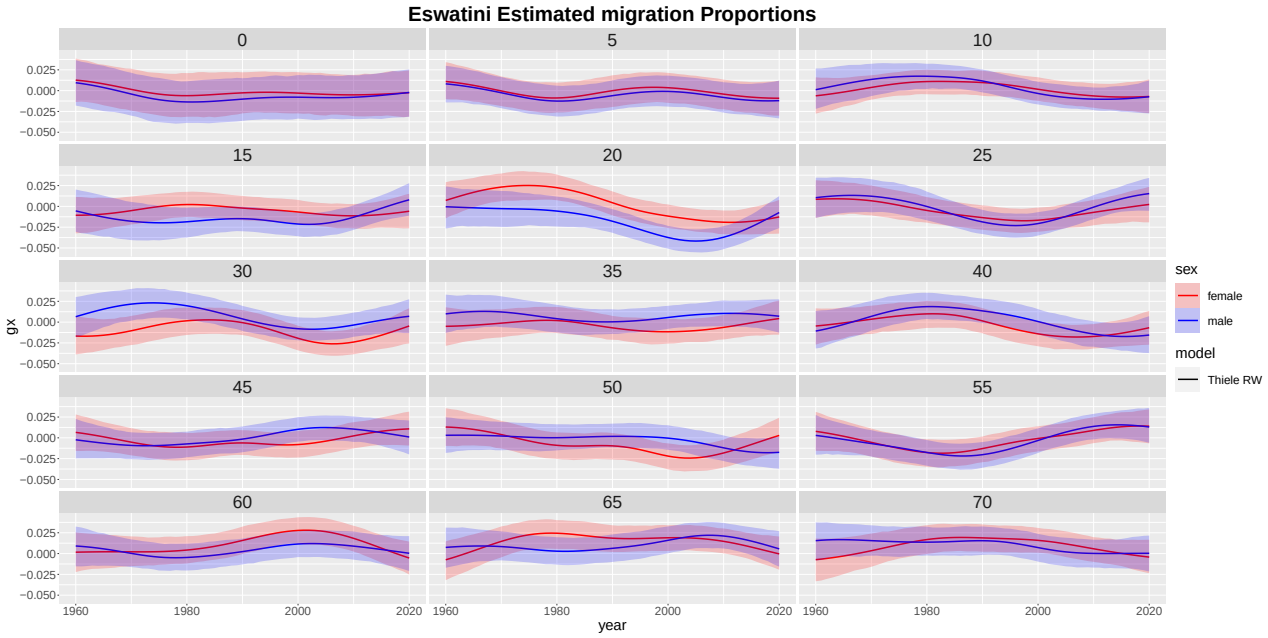

Figure 14: Migration

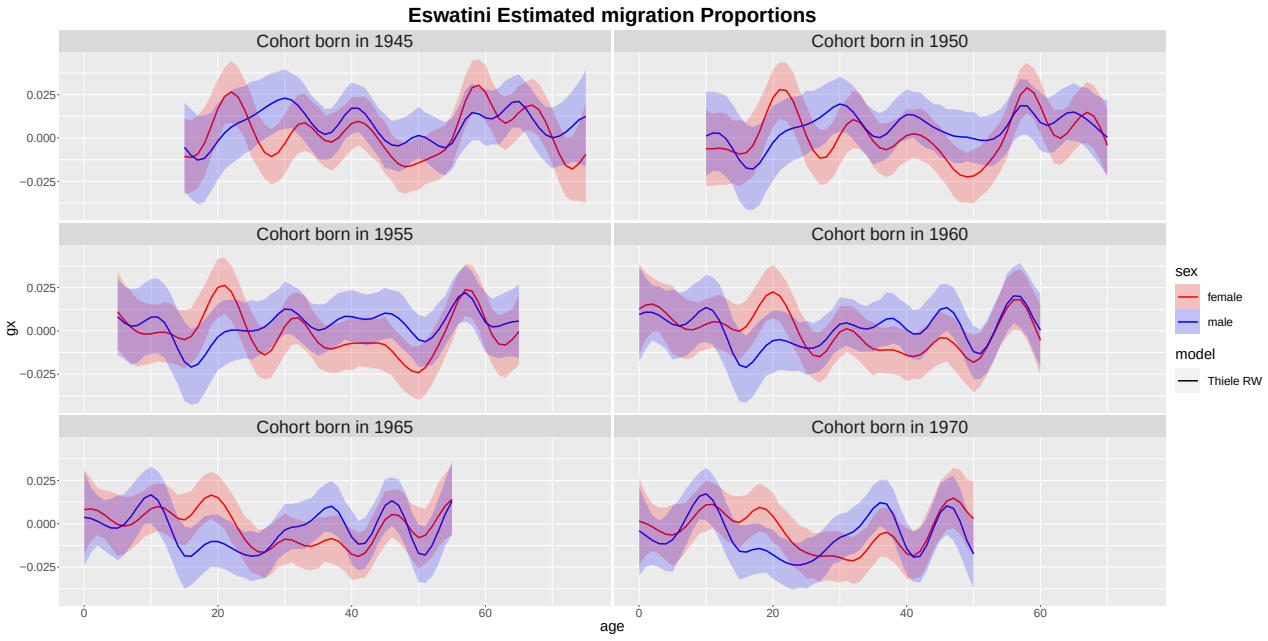

Figure 15: Migration

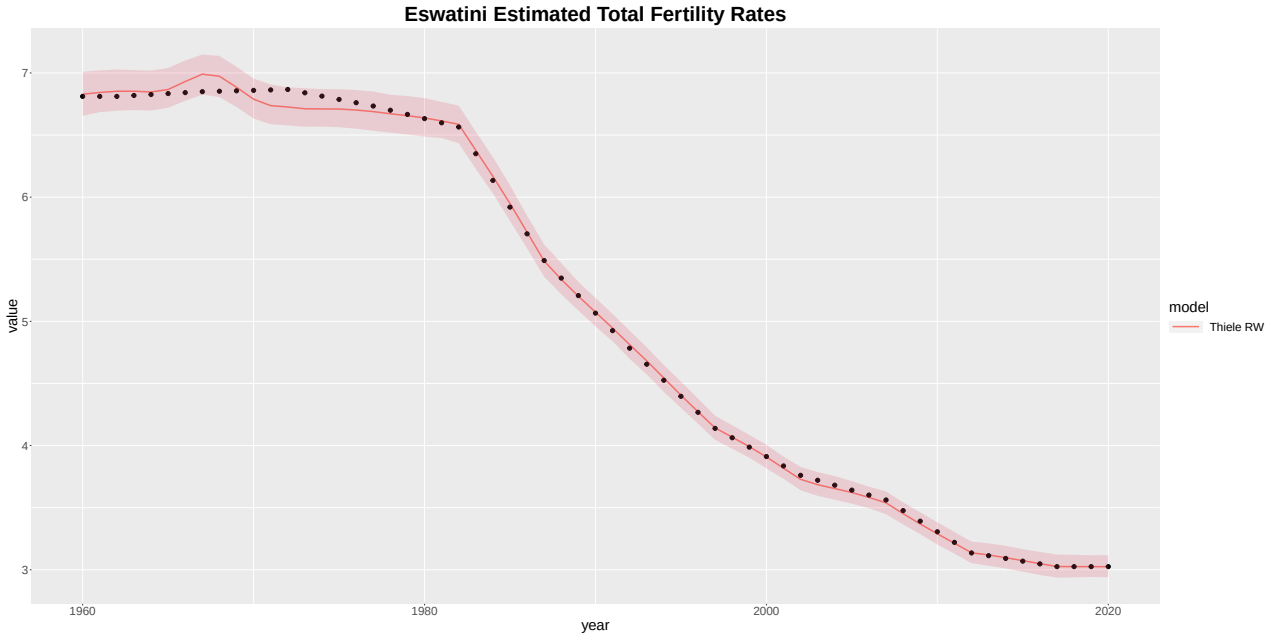

Figure 16: Total Fertility

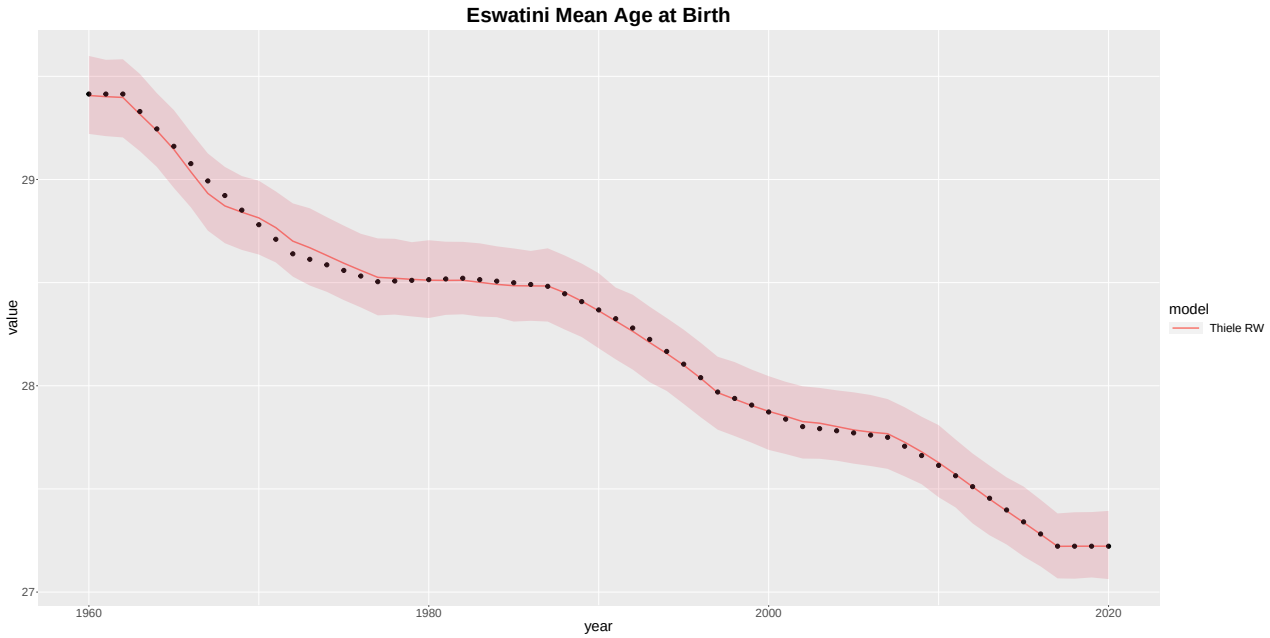

Figure 17: Mean age at births

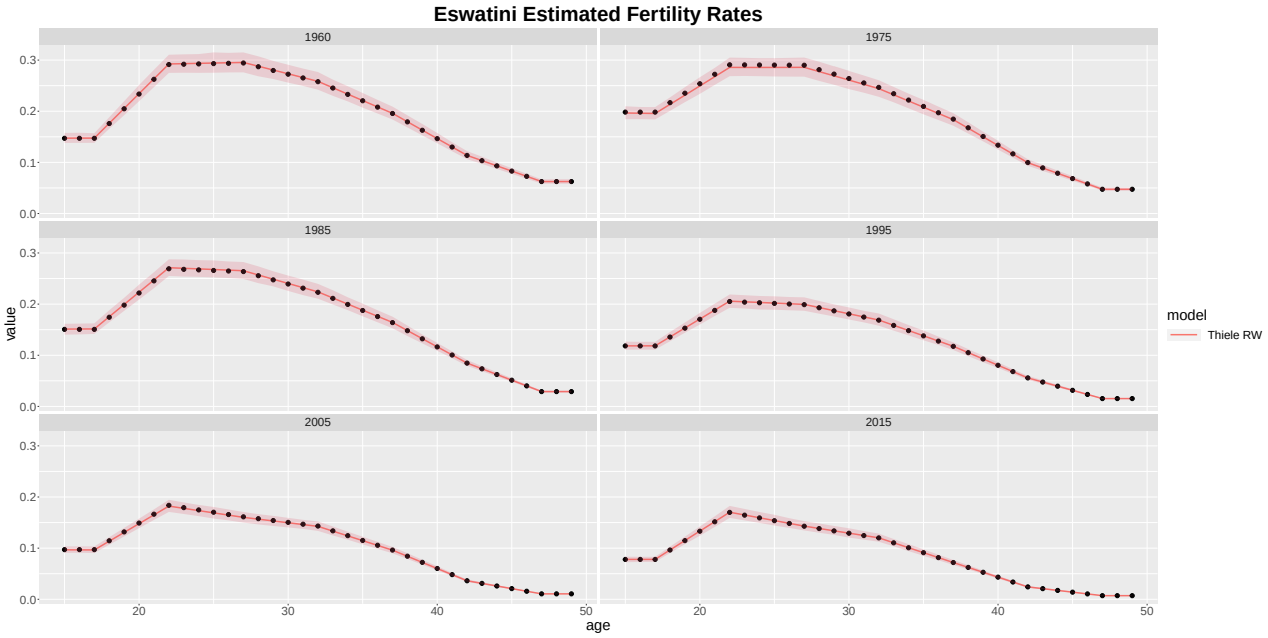

Figure 18: Fertility

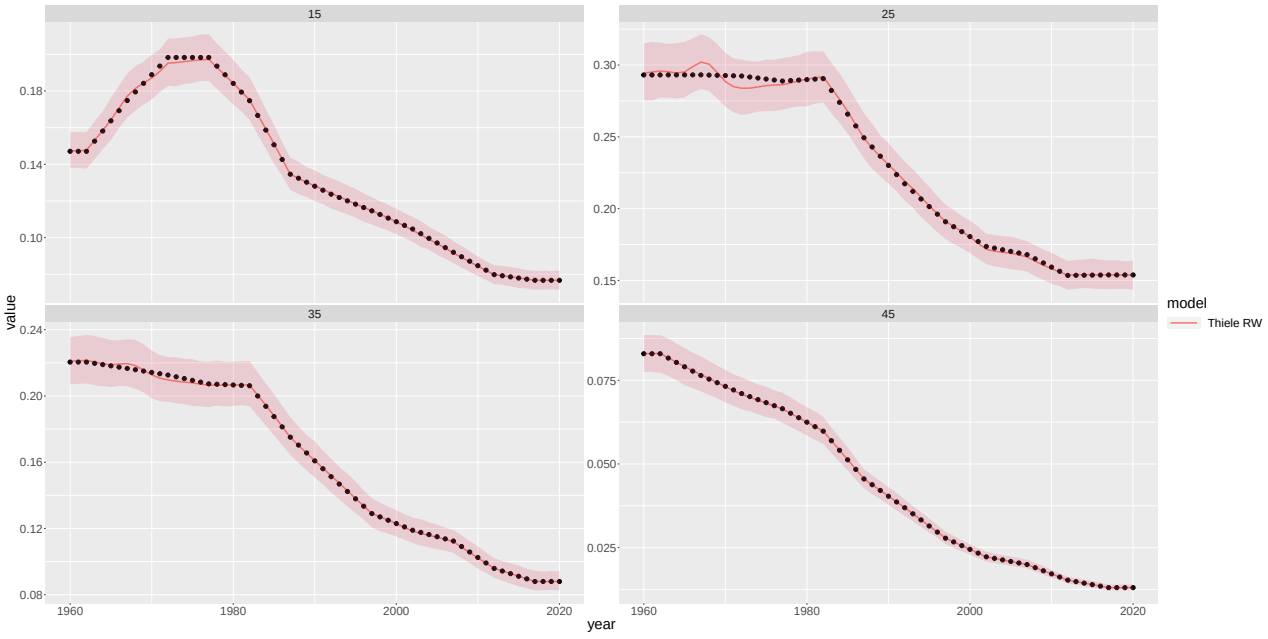

Figure 19: Fertility