Benin

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

```
## # A tibble: 87 x 3
##      age `1992`  `2002`
##    <dbl>  <dbl>   <dbl>
##  1     0 80766. 117101.
##  2     1 77155. 105326.
##  3     2 90679. 115866.
##  4     3 92932. 117645.
##  5     4 92182. 117123.
##  6     5 88787. 114291.
##  7     6 87250. 112404.
##  8     7 84485. 110108.
##  9     8 79456. 105795.
## 10     9 73393.  99478.
## # ... with 77 more rows
```

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

```
## # A tibble: 87 x 3
##      age `1992`  `2002`
##    <dbl>  <dbl>   <dbl>
##  1     0 81377. 118253.
##  2     1 78137. 107408.
##  3     2 91868. 118379.
##  4     3 94884. 120801.
##  5     4 95300. 120629.
##  6     5 92895. 118245.
##  7     6 92177. 117003.
##  8     7 90185. 115409.
##  9     8 85807. 111629.
## 10     9 80054. 105548.
## # ... with 77 more rows
```

Thiele log-Normal Hump Spline

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

```
##           log_tau2_logpop_f          log_tau2_logpop_f           log_tau2_logpop_m           log_tau2_
##                   5.9707820                  5.0187460                   5.9969279                   4
##               log_tau2_gx_m        log_lambda_gx_age_f         log_lambda_gx_age_m        log_lambda_g
##                   3.3091813                  5.0817201                   5.9741882                   7
##     log_lambda_gx_agetime_m             log_lambda_tp log_lambda_tp_0_inflated_sd           log_dispe
##                   6.9078458                  1.4104339                  -1.0177175                   0
##     log_marginal_prec_psi_f       log_marginal_prec_A_f       log_marginal_prec_B_f     log_marginal_pre
##                   4.3131341                  6.7833245                   6.5282875                   4
##       log_marginal_prec_B_m           log_lambda_phi_f            log_lambda_psi_f         log_lambda_
##                   6.8116735                  4.3686326                   4.3315318                   3
##              log_lambda_A_f             log_lambda_B_f           log_lambda_phi_m           log_lambd
##                   4.3063207                  4.2843606                   4.3967860                   4
##        log_lambda_epsilon_m             log_lambda_A_m              log_lambda_B_m
##                   4.5079671                  4.3048926                   4.2961827
```

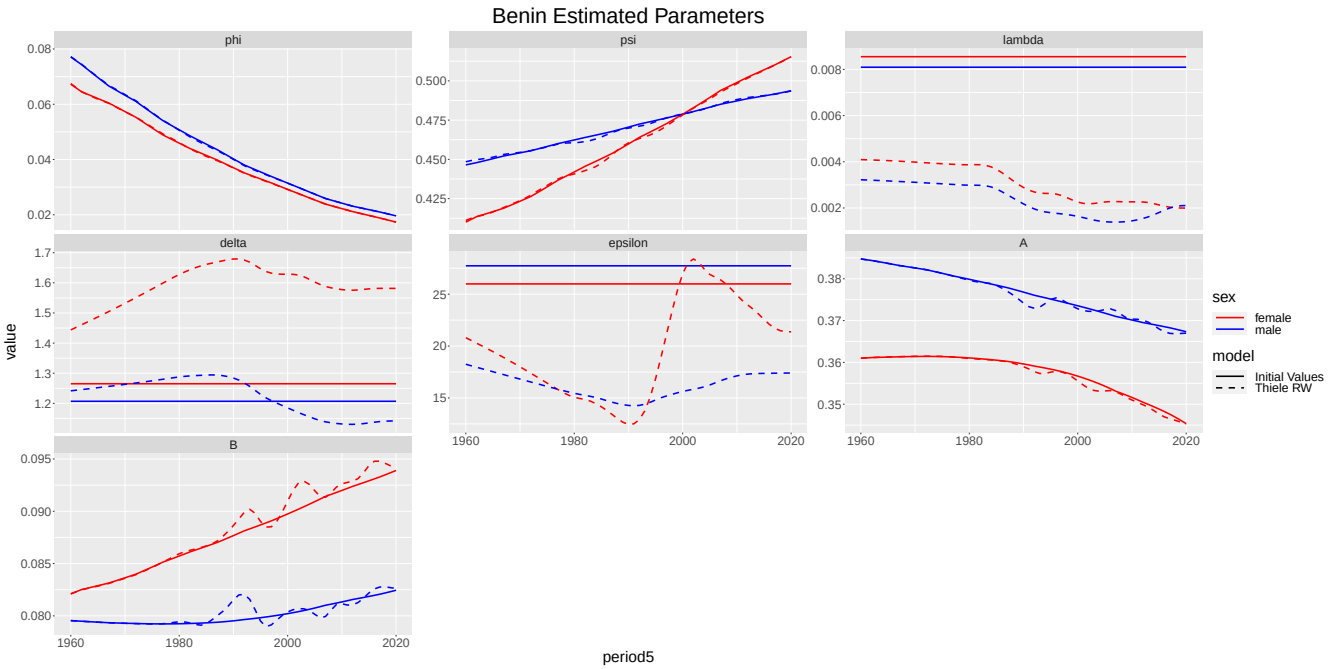

Figure 1: Estimated parameters

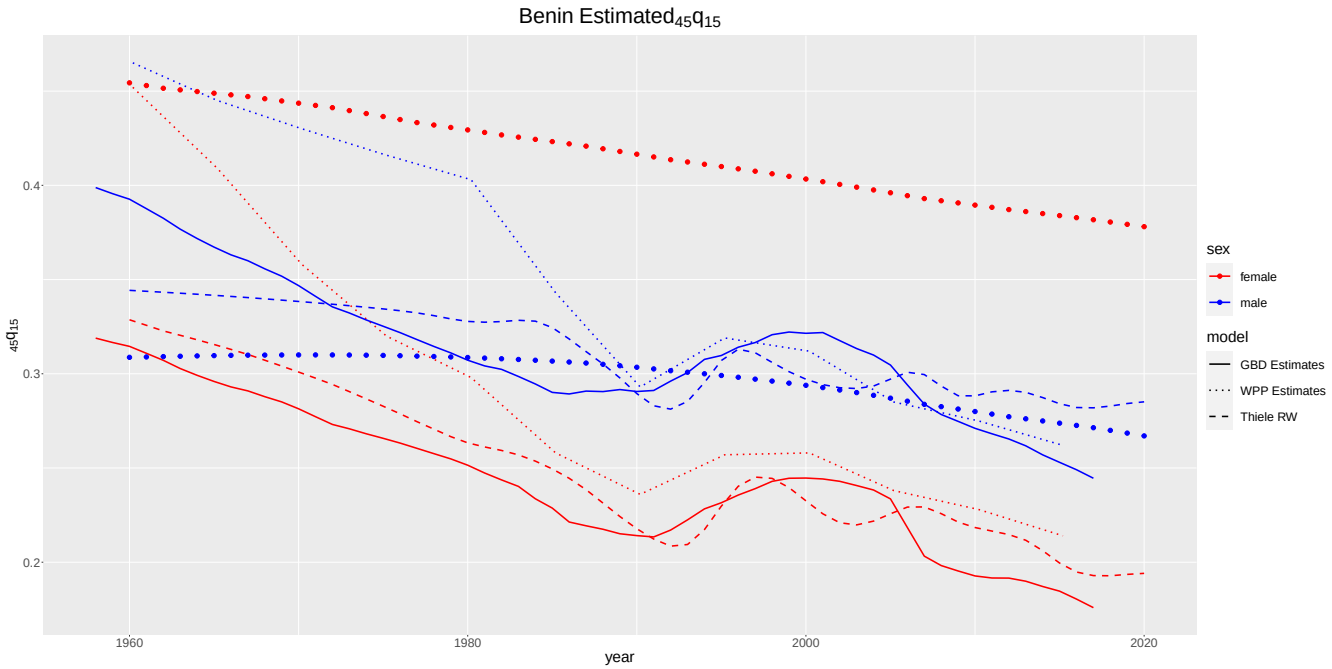

Figure 2: Estimated ${}_{45}q_{15}$

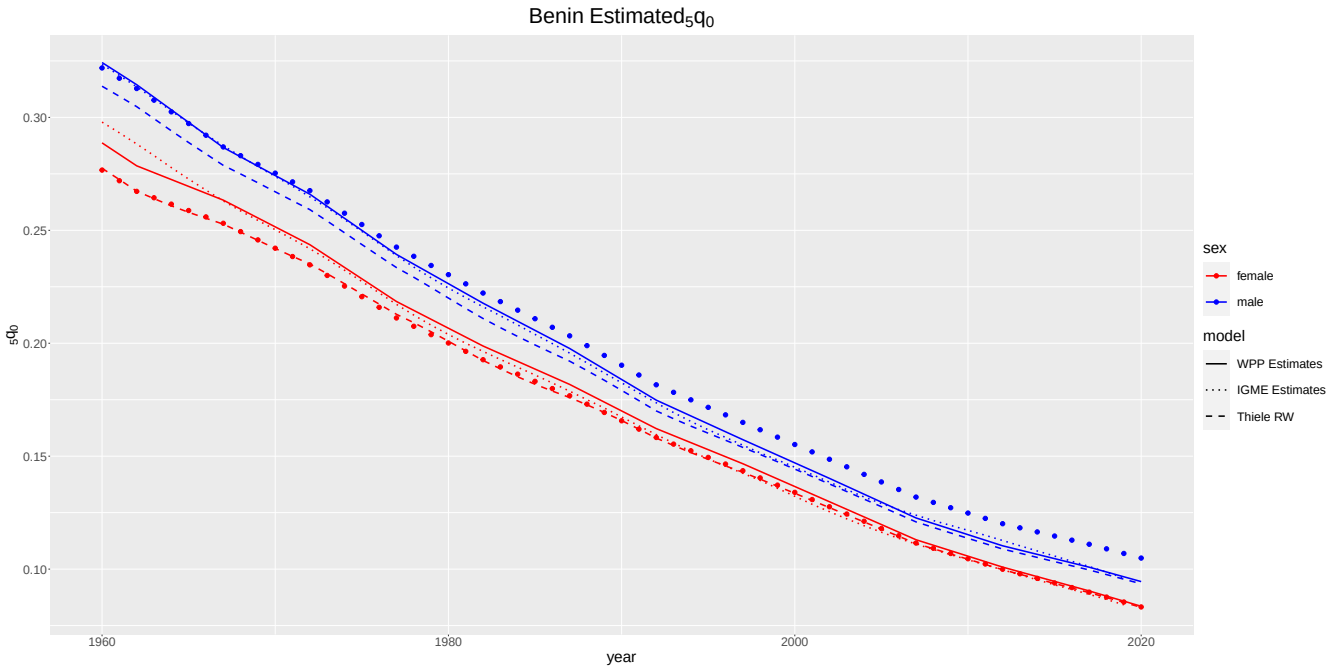

Figure 3: Estimated $_5q_0$

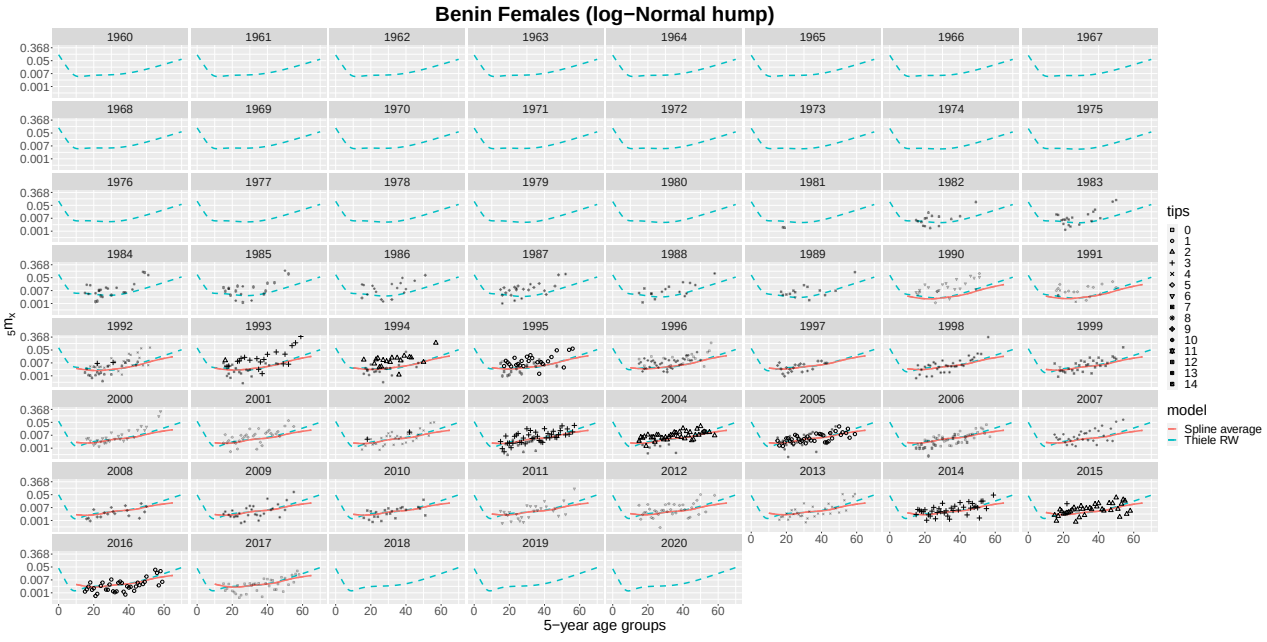

Figure 4: Mortality Schedules

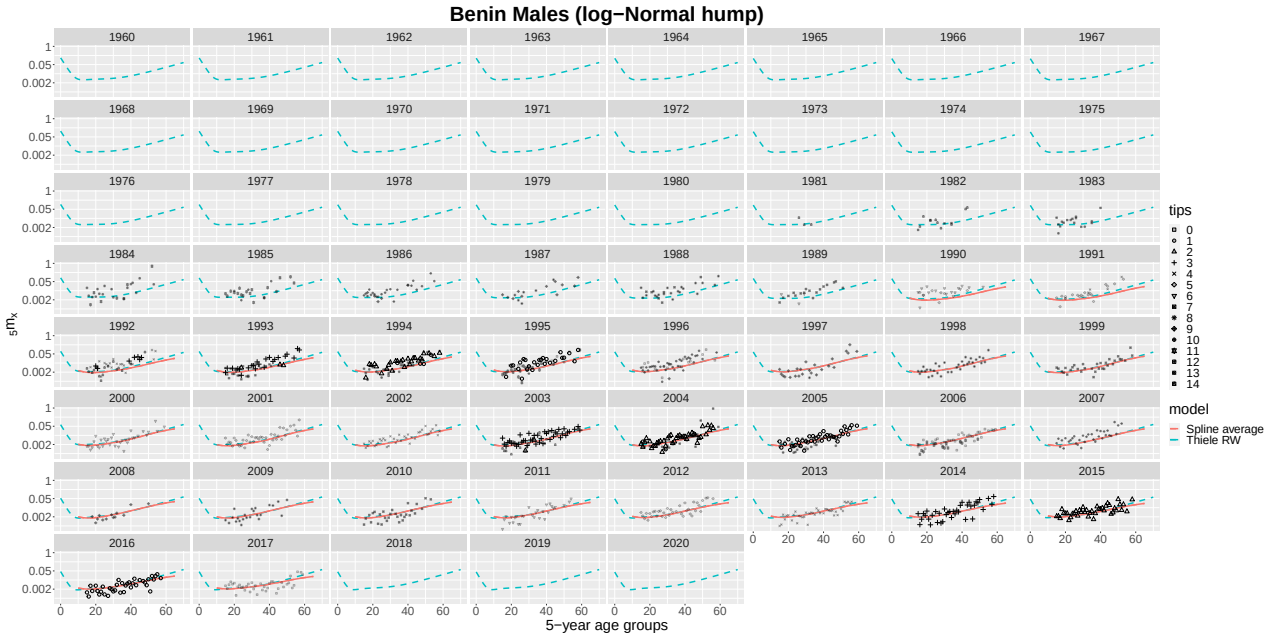

Figure 5: Mortality Schedules

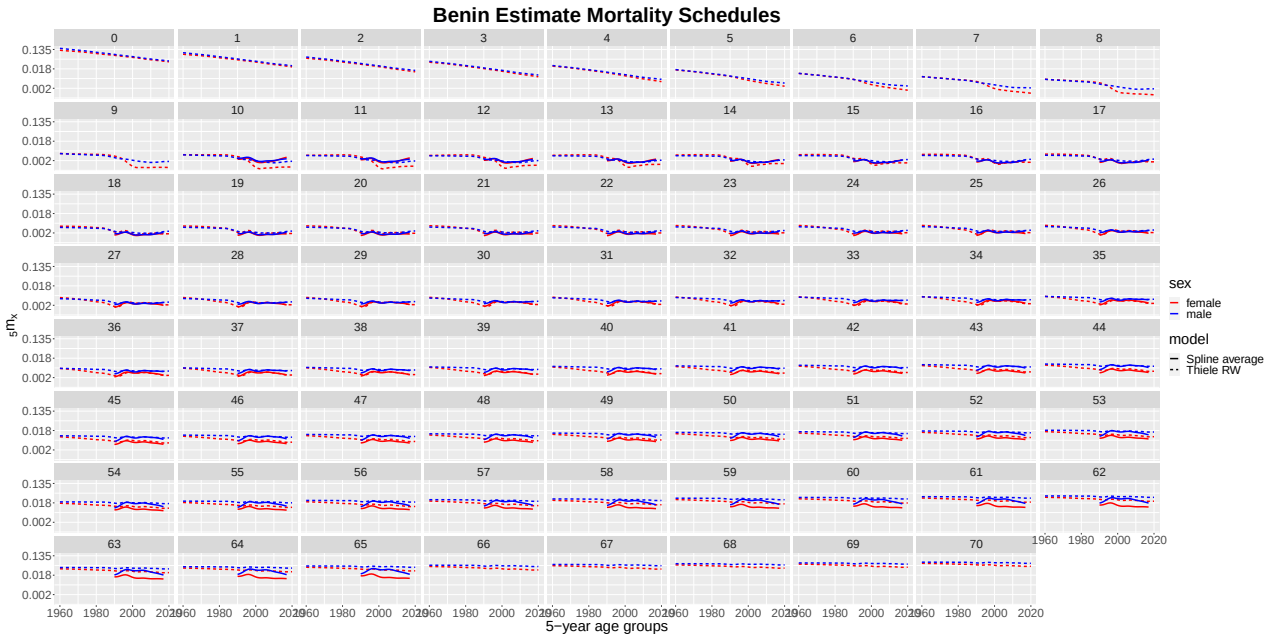

Figure 6: Mortality Schedules

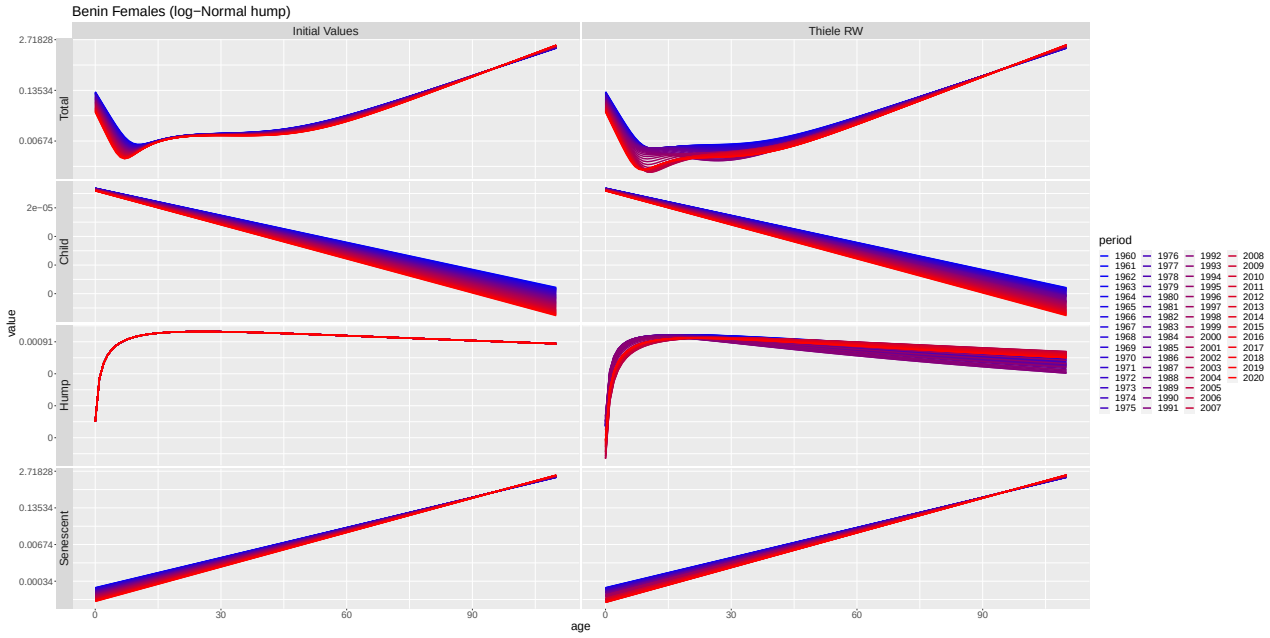

Figure 7: Thiele Decomposed

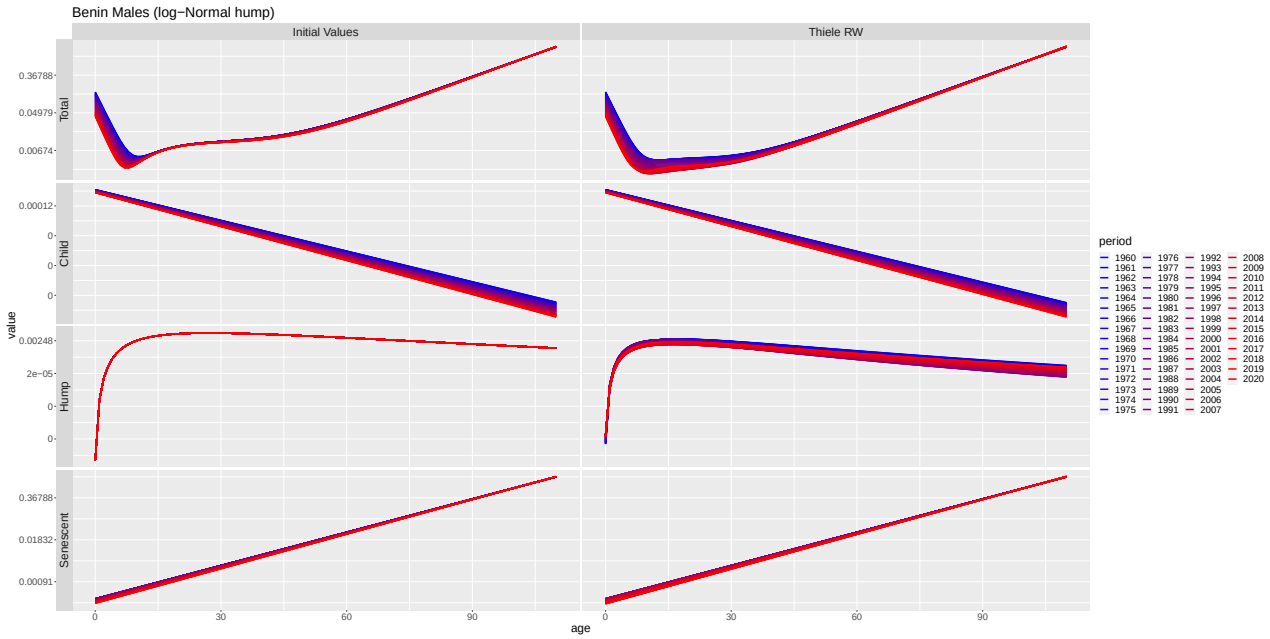

Figure 8: Thiele Decomposed

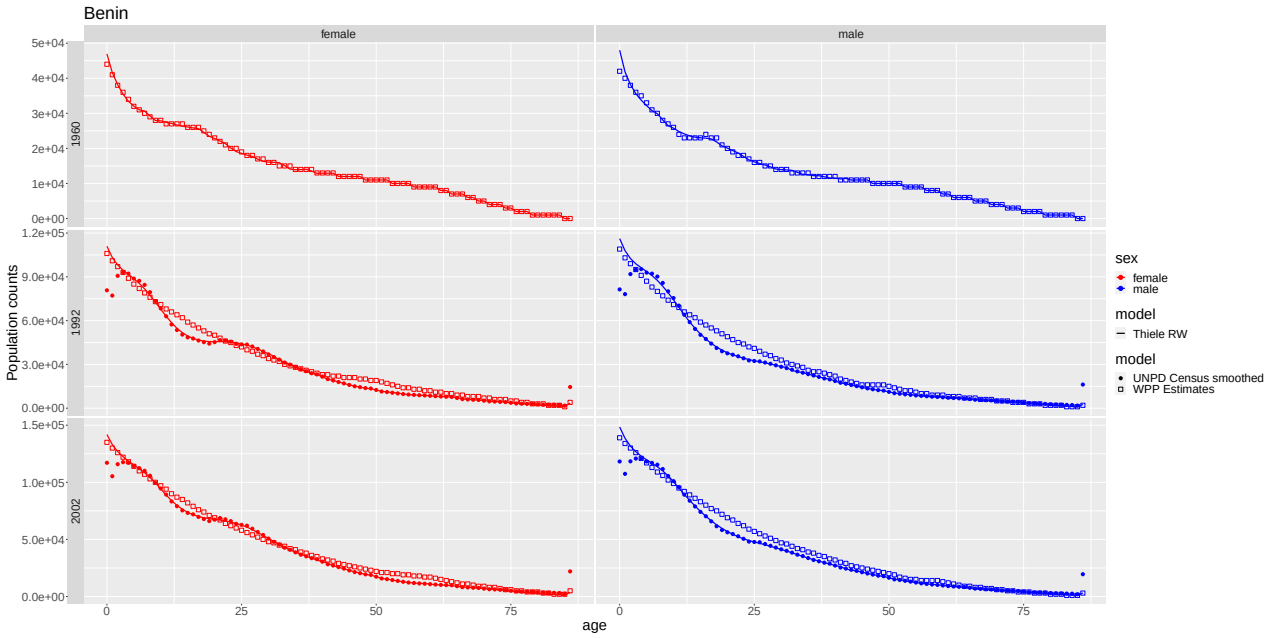

Figure 9: Population

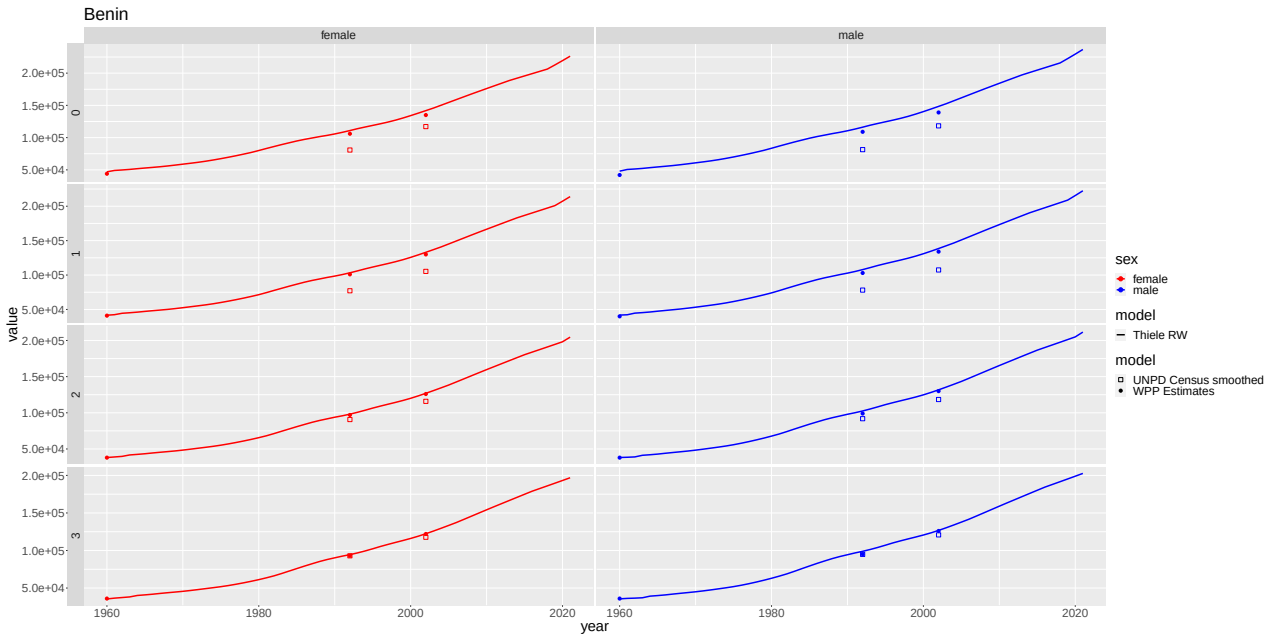

Figure 10: Population

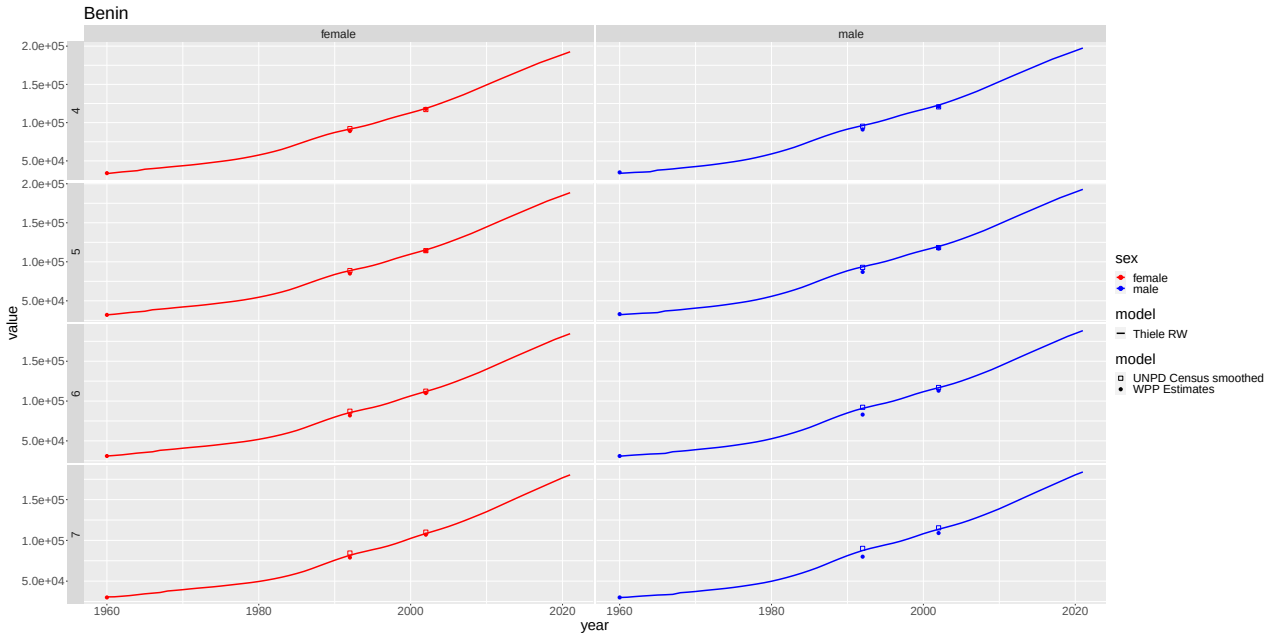

Figure 11: Population

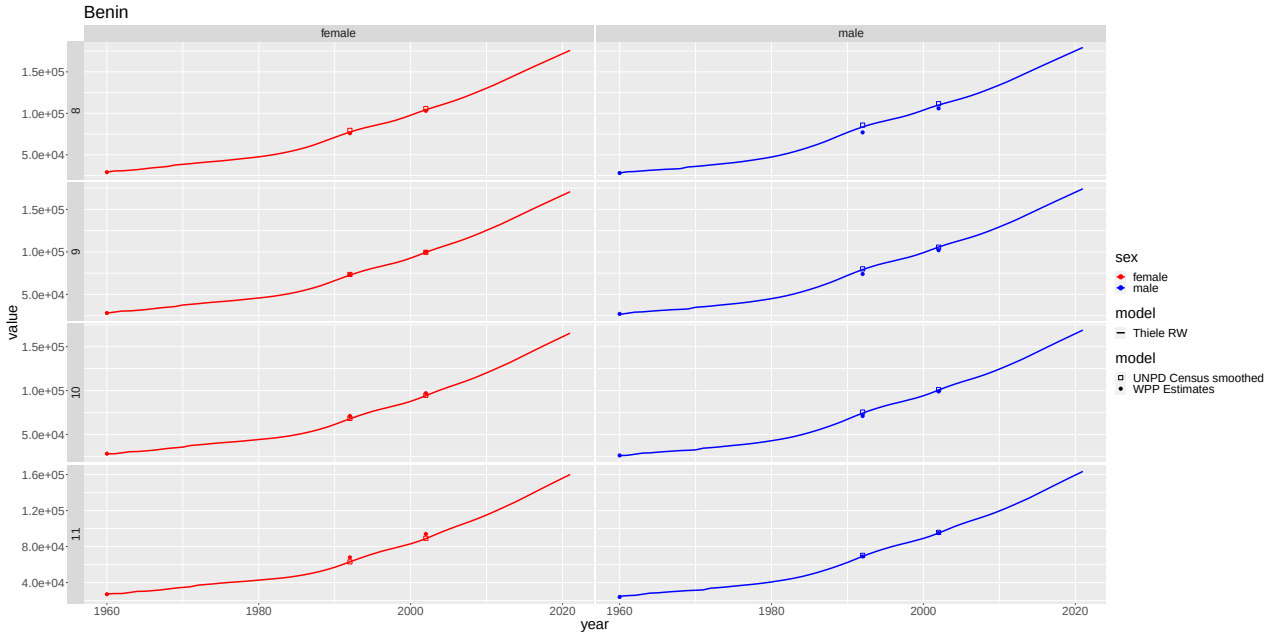

Figure 12: Population

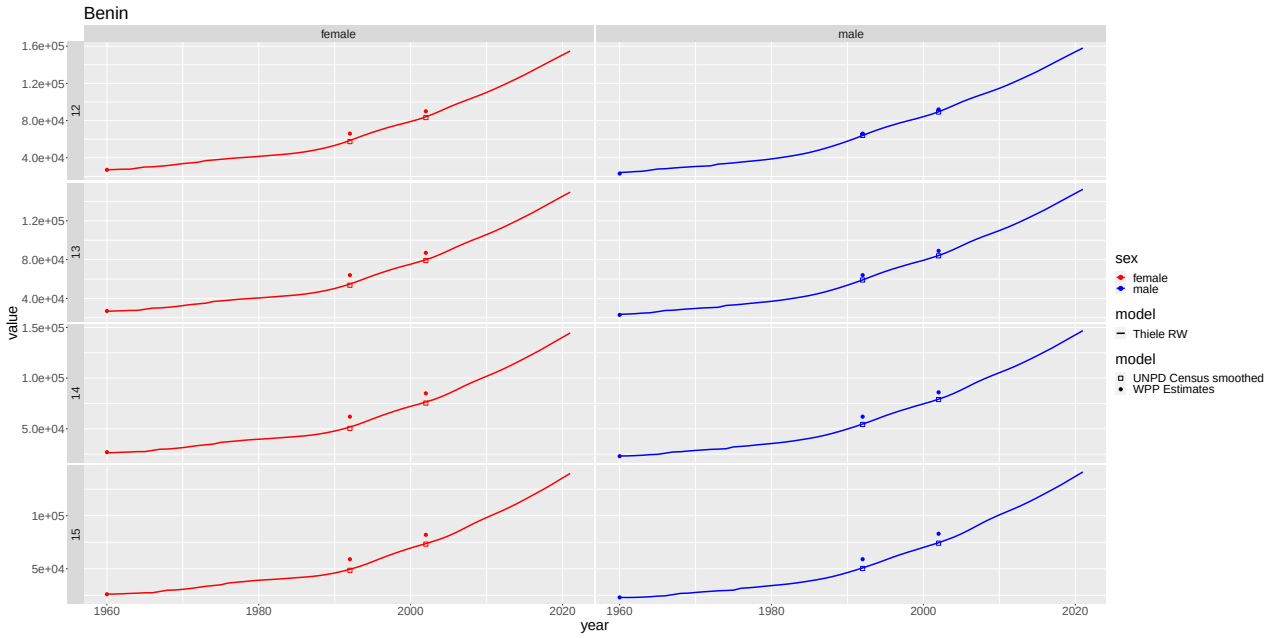

Figure 13: Population

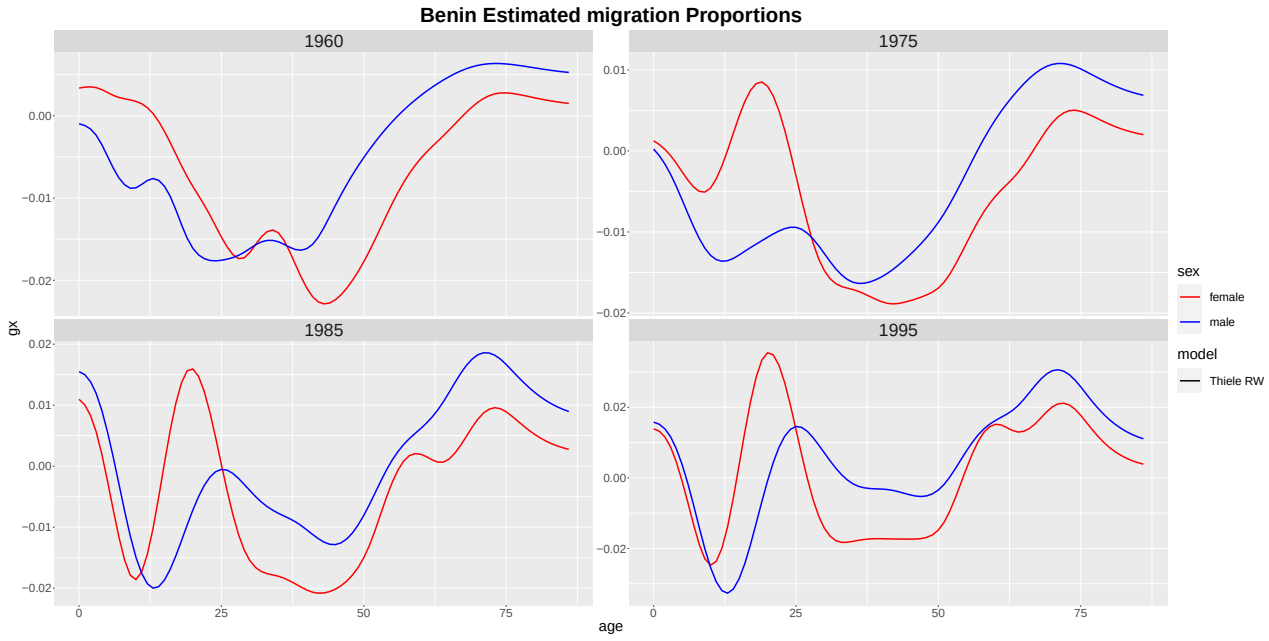

Figure 14: Migration

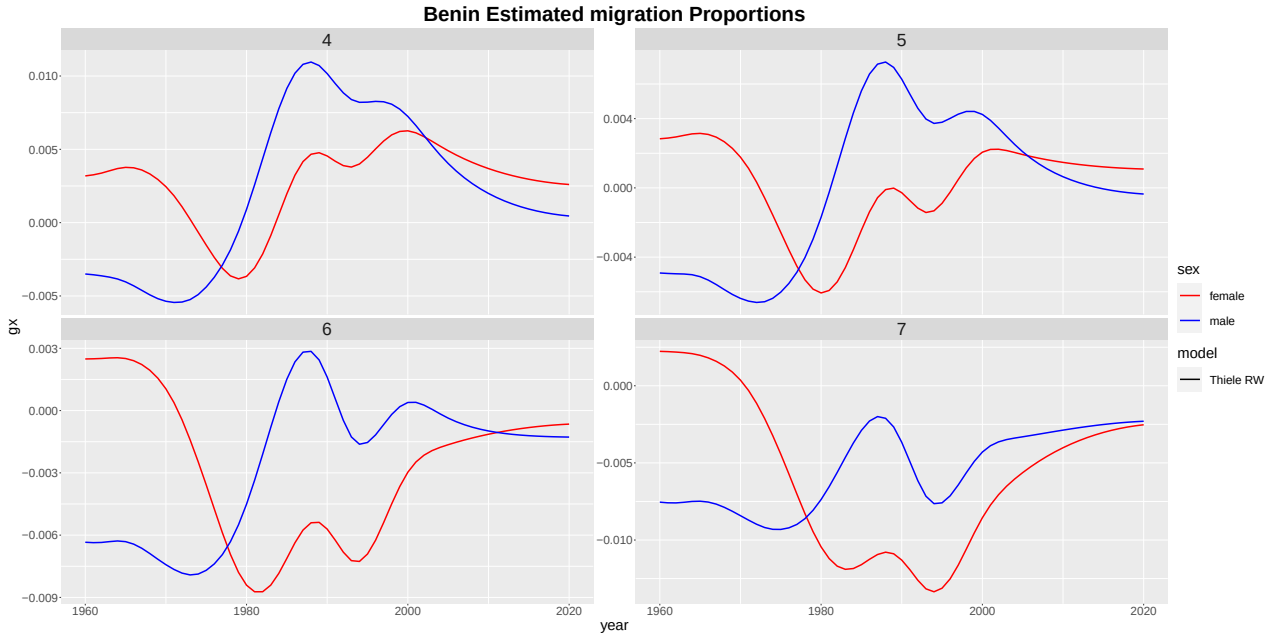

Figure 15: Migration

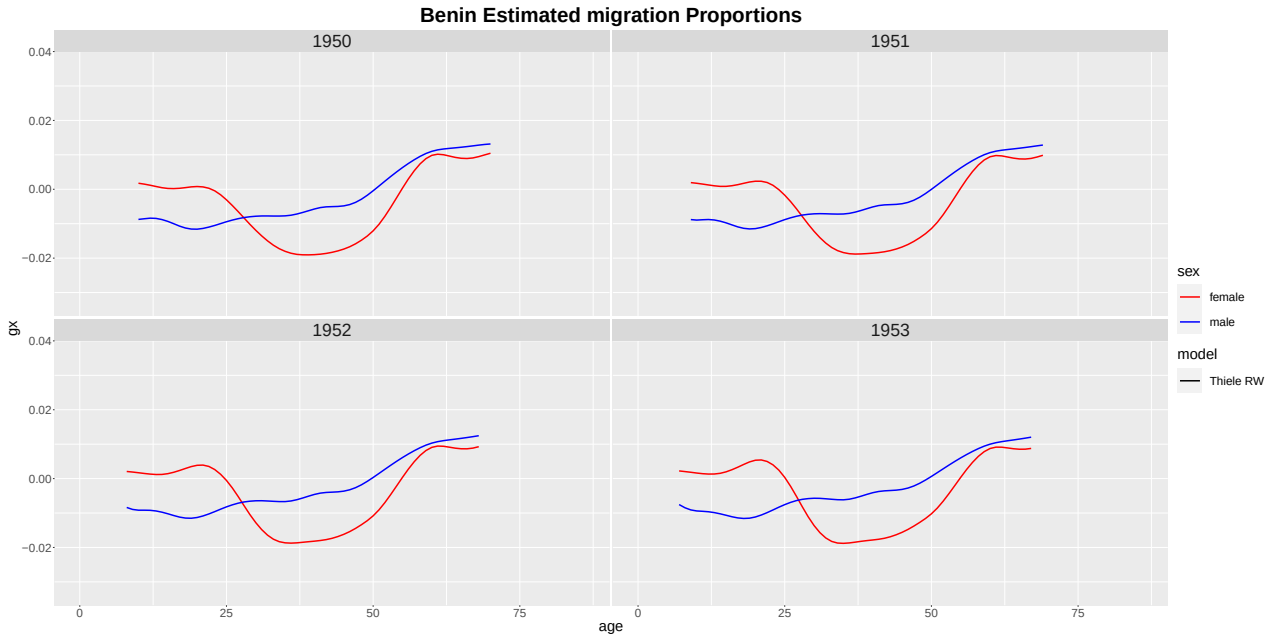

Figure 16: Migration

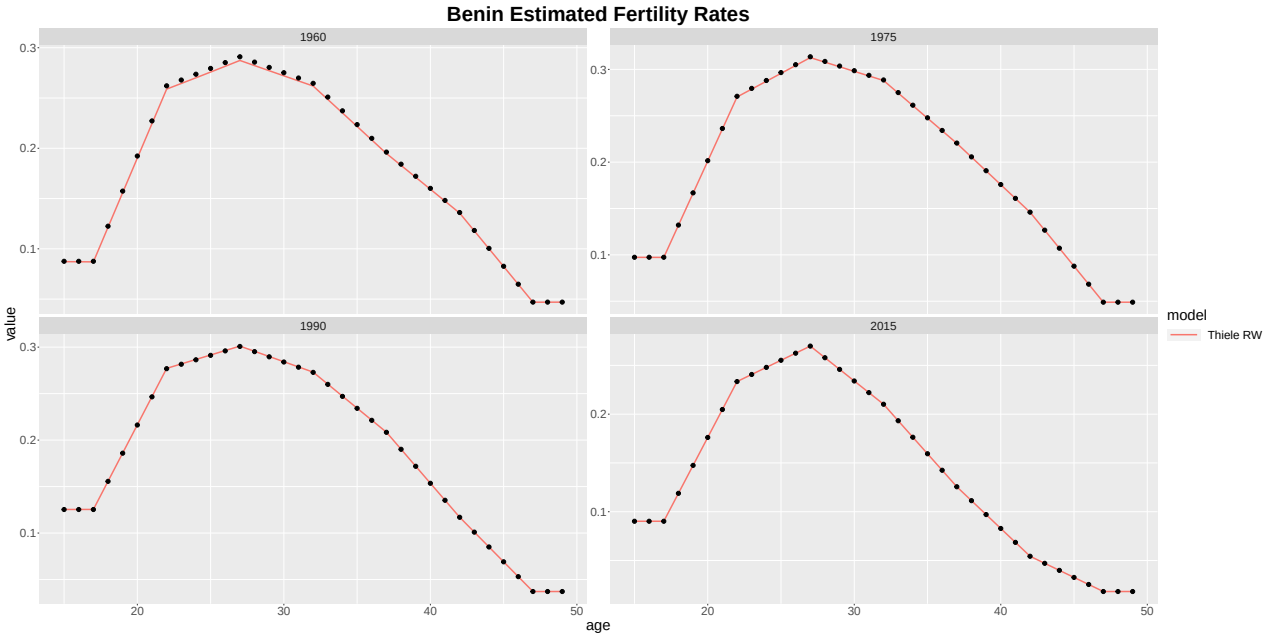

Figure 17: Fertility

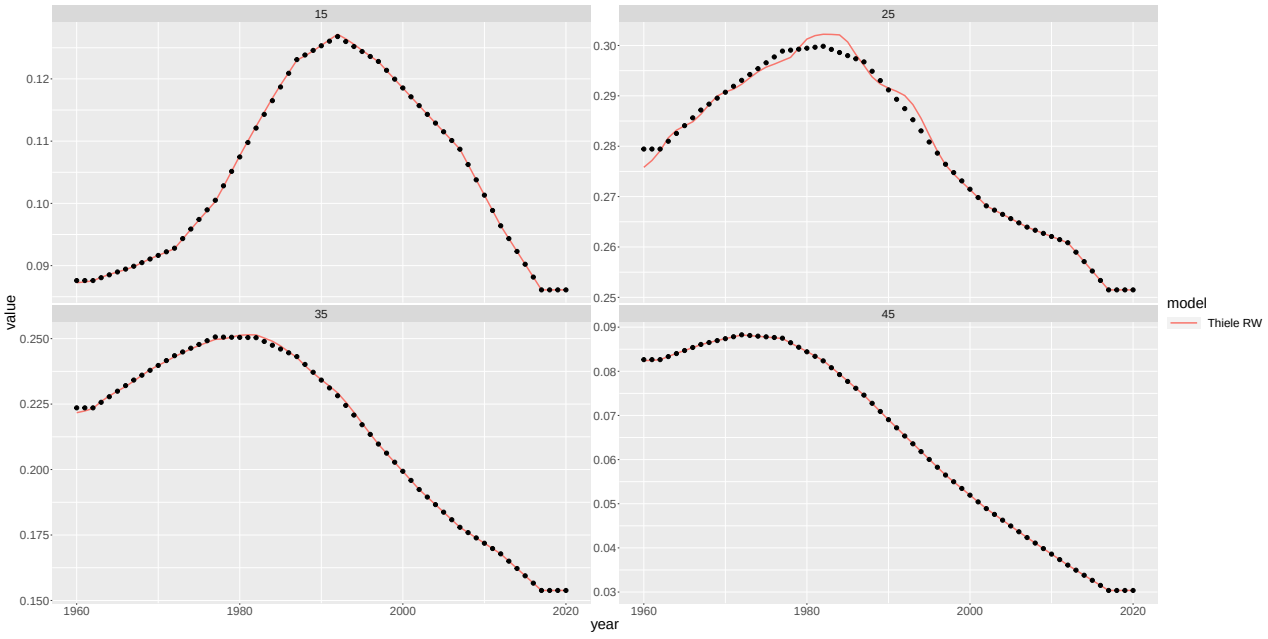

Figure 18: Fertility

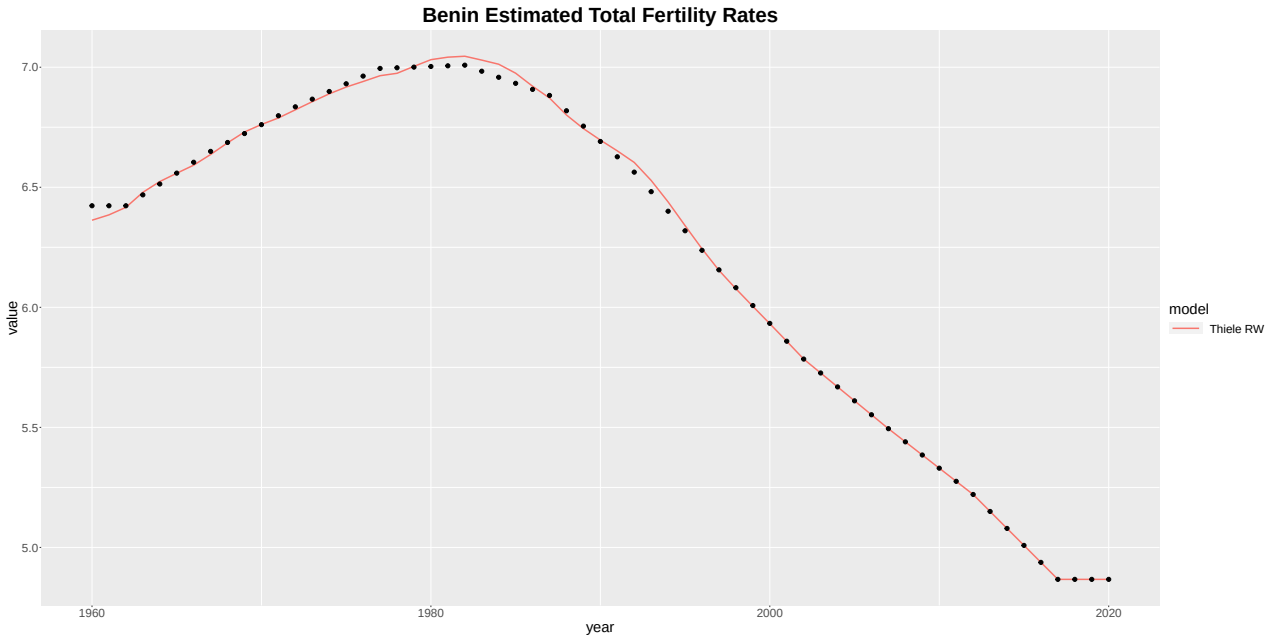

Figure 19: Total Fertility