Zimbabwe

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

## # A tibble: 43 x 6
##      age `1969` `1982` `1992` `2002` `2012`
##    <dbl>  <dbl>  <dbl>  <dbl>  <dbl>  <dbl>
## 1      0   415. 271854. 328828. 343114. 426693.
## 2      2   448. 264446. 318479. 333634. 389402.
## 3      4   491. 257906. 324455. 321781. 360807.
## 4      6   519. 246989. 324110. 312154. 345123.
## 5      8   521. 233983. 319723. 307684. 340926.
## 6     10   518. 220253. 306561. 306656. 344293.
## 7     12   467. 202150. 291974. 303190. 331478.
## 8     14   432. 187143. 274762. 305203. 316030.
## 9     16   370. 175135. 256694. 306152. 292142.
## 10    18   345. 162005. 239001. 301663. 280450.
## # ... with 33 more rows

## [1] "Census Males"

## # A tibble: 43 x 6
##      age `1969` `1982` `1992` `2002` `2012`
##    <dbl>  <dbl>  <dbl>  <dbl>  <dbl>  <dbl>
## 1      0   470. 263111. 326175. 342853. 424035.
## 2      2   466. 256279. 315825. 333393. 387255.
## 3      4   490. 252344. 321073. 321414. 358706.
## 4      6   520. 243658. 319735. 310629. 342480.
## 5      8   542. 233752. 315848. 304305. 338264.
## 6     10   530. 222239. 303153. 303523. 343293.
## 7     12   478. 204112. 288903. 301810. 333269.
## 8     14   434. 184258. 269704. 303010. 318052.
## 9     16   382. 164894. 247847. 295706. 287118.
## 10    18   332. 145485. 225824. 278207. 261361.
## # ... with 33 more rows
```

Thiele log-Normal Hump RW

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

##           log_tau2_logpop_f           log_tau2_logpop_f
##                   5.8414441                   4.3881933
##           log_tau2_logpop_m           log_tau2_logpop_m
##                   5.8852051                   4.4343446
##                 log_tau2_fx                 log_tau2_gx_f
##                   4.2964869                   4.4796298
##               log_tau2_gx_m               logit_rho_g_x_f
##                   4.3642591                   5.1115516
##               logit_rho_g_t_f             logit_rho_g_x_m
##                   4.5732771                   4.7315963
##               logit_rho_g_t_m               log_lambda_tp
##                   5.3733447                   2.7875690
## log_lambda_tp_0_inflated_sd             log_dispersion_f
##                   0.3531190                   1.9795332
```

```
##                log_dispersion_m   log_marginal_prec_phi_f
##                       2.0148395                 4.6595622
##        log_marginal_prec_psi_f log_marginal_prec_lambda_f
##                       4.5892780                 2.1259547
##      log_marginal_prec_delta_f log_marginal_prec_epsilon_f
##                       3.0460362                 3.9469559
##            log_marginal_prec_A_f        log_marginal_prec_B_f
##                       6.8934153                 6.6231615
##          log_marginal_prec_phi_m      log_marginal_prec_psi_m
##                       4.5971096                 4.6050586
##      log_marginal_prec_lambda_m   log_marginal_prec_delta_m
##                       1.7972213                 2.7009100
##     log_marginal_prec_epsilon_m        log_marginal_prec_A_m
##                       3.9372605                 6.8944199
##            log_marginal_prec_B_m               logit_rho_phi_f
##                       4.5772140                 1.3445778
##                 logit_rho_psi_f               logit_rho_A_f
##                       1.2008855                 1.1072108
##                   logit_rho_B_f             logit_rho_phi_m
##                       0.8064305                 1.4429933
##                 logit_rho_psi_m               logit_rho_A_m
##                       1.2476128                 0.7936407
##                   logit_rho_B_m
##                       2.5746691
```
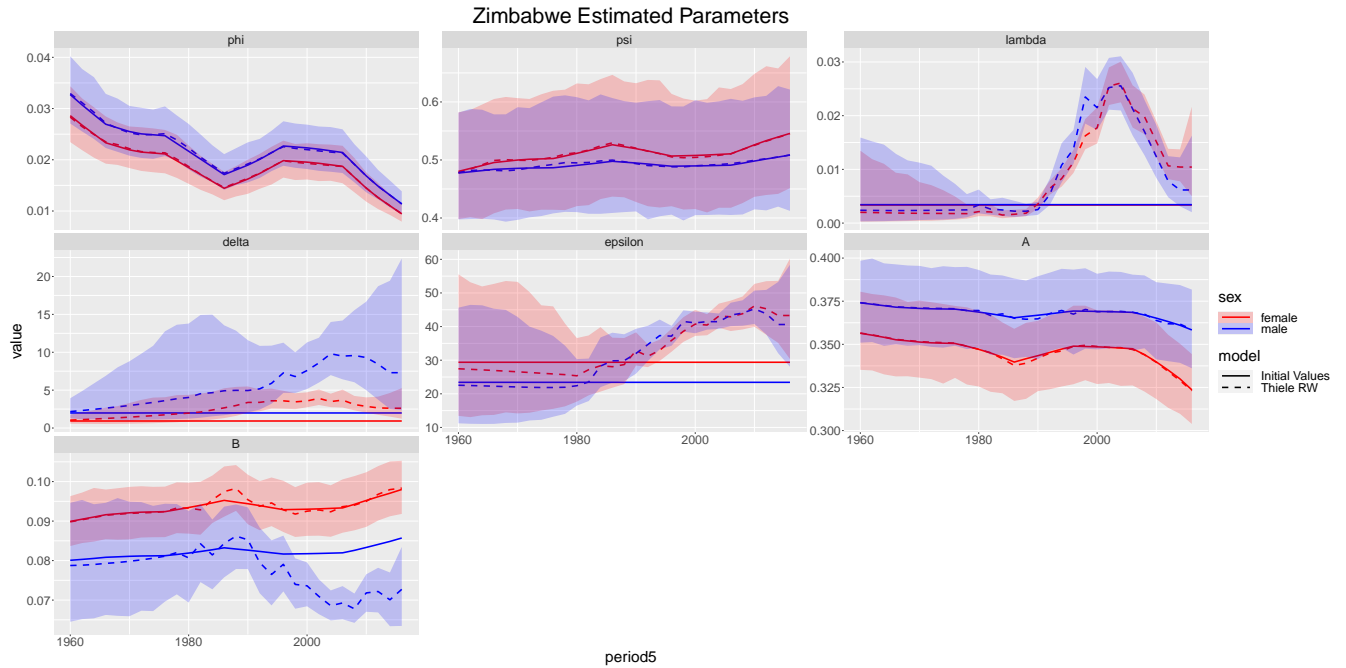

Figure 1: Estimated parameters
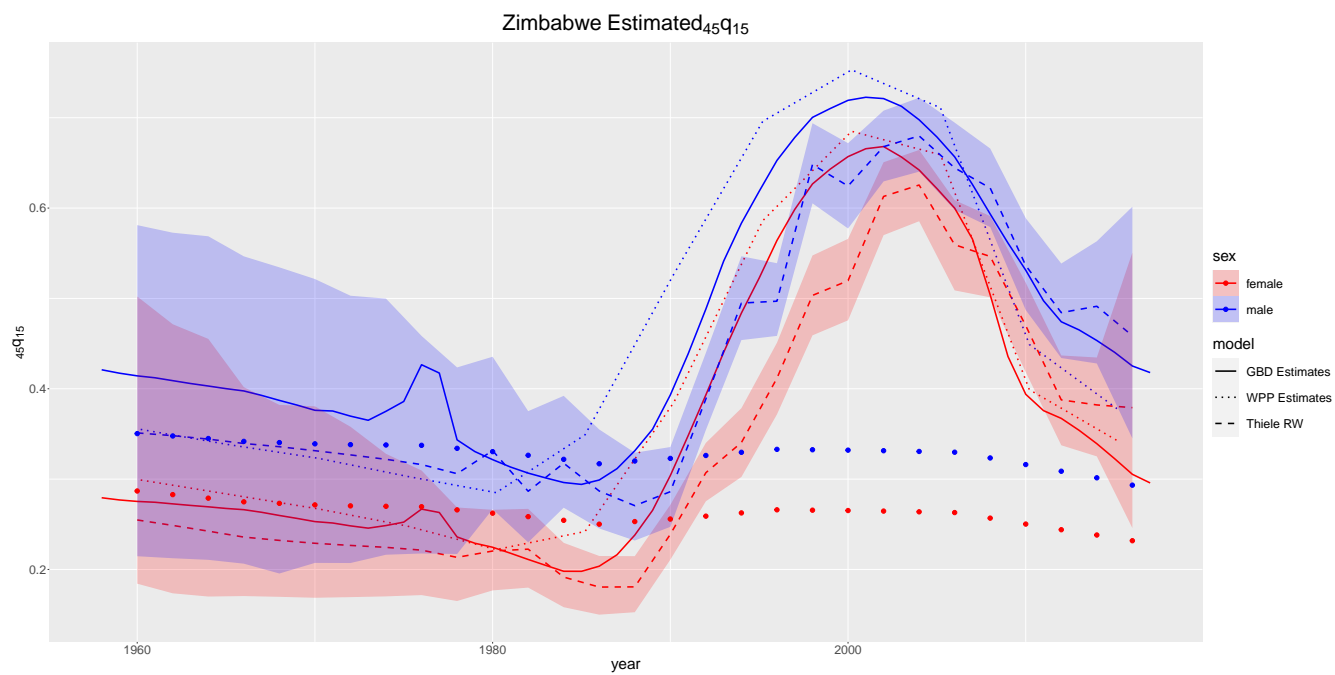
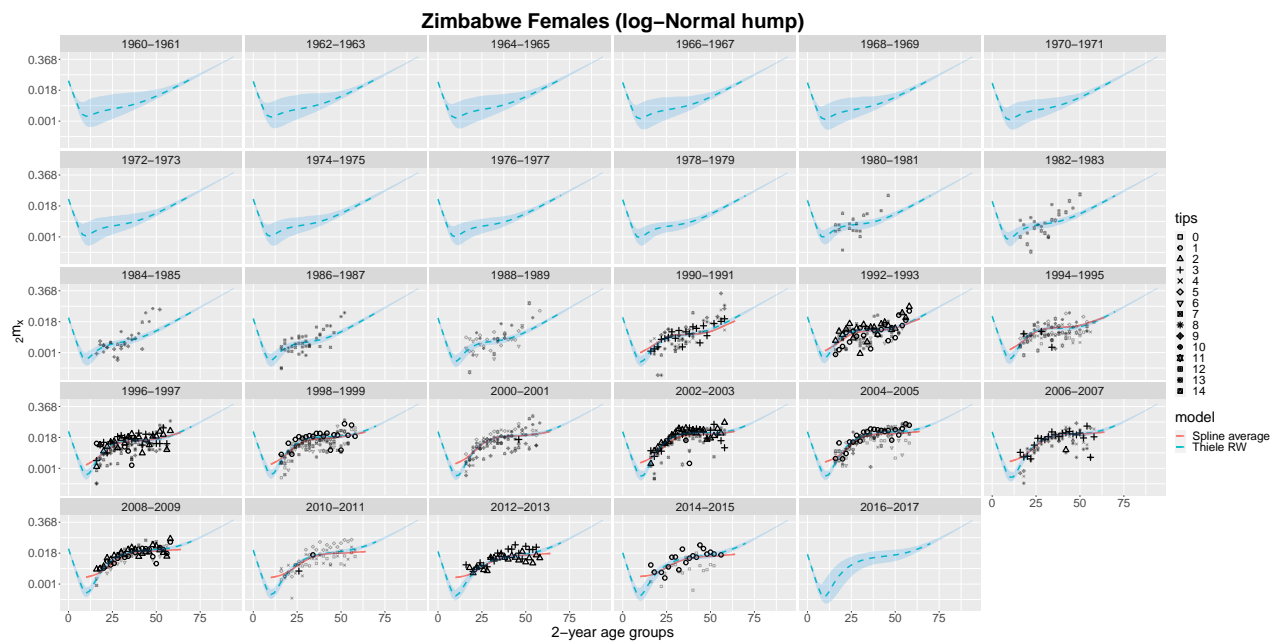Figure 2: Estimated $_{45}q_{15}$
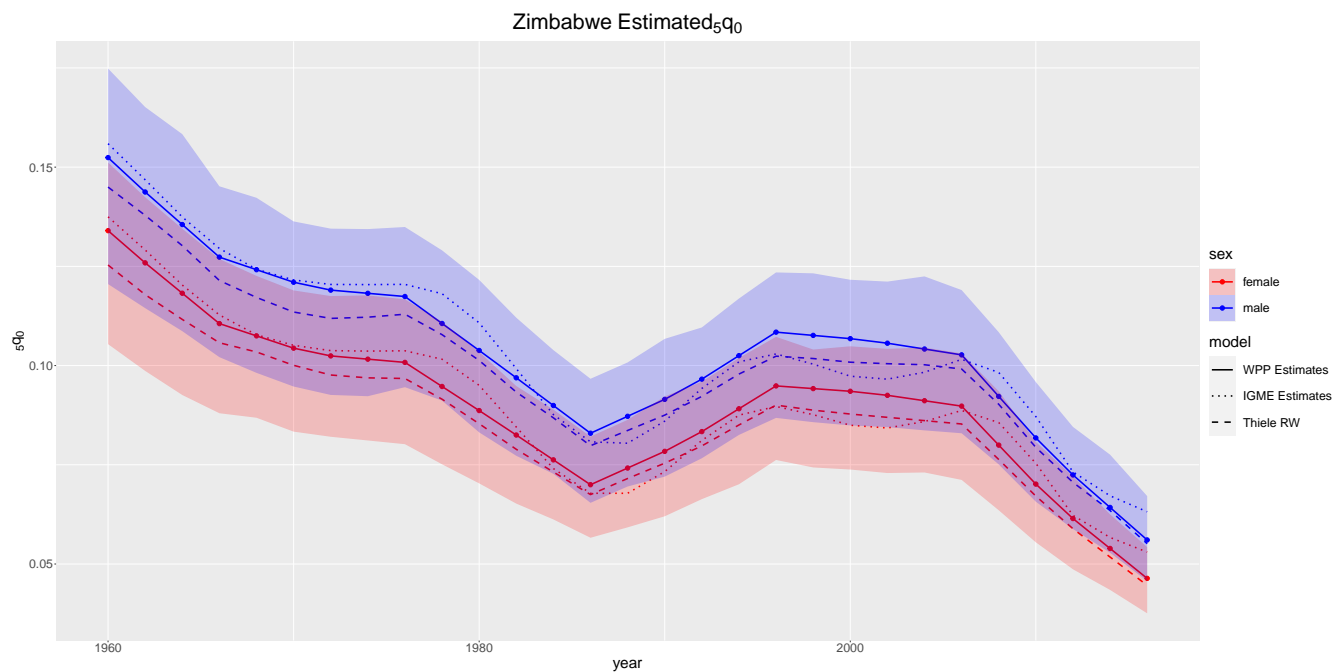
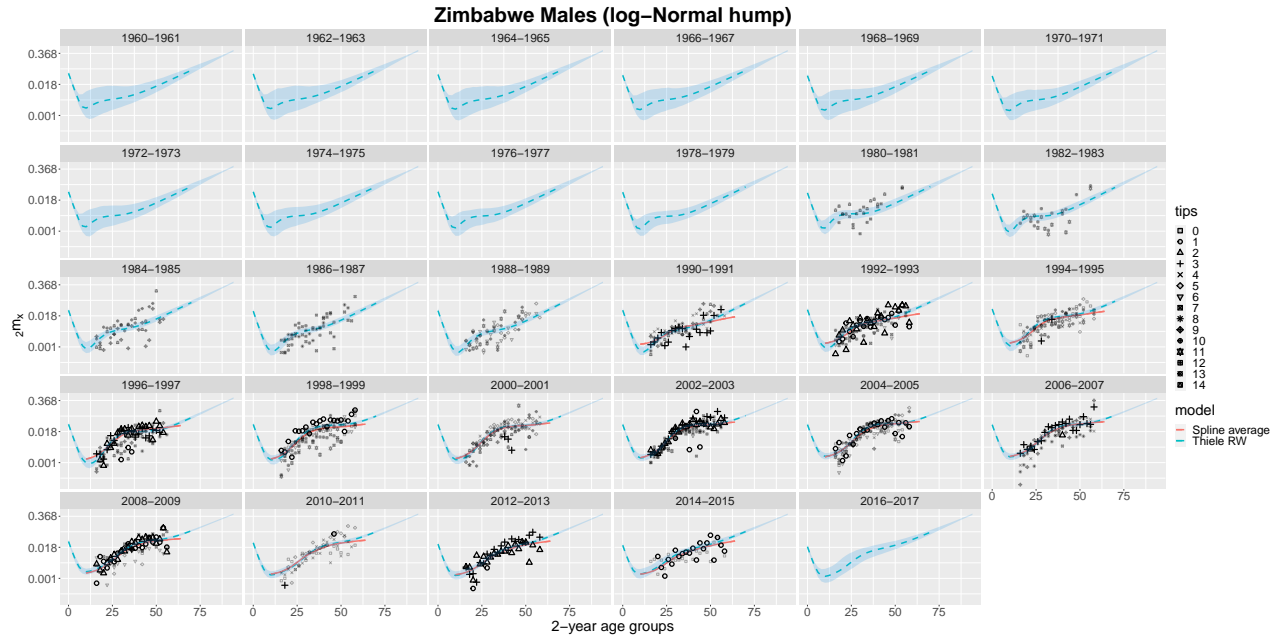Figure 3: Estimated $_5q_0$

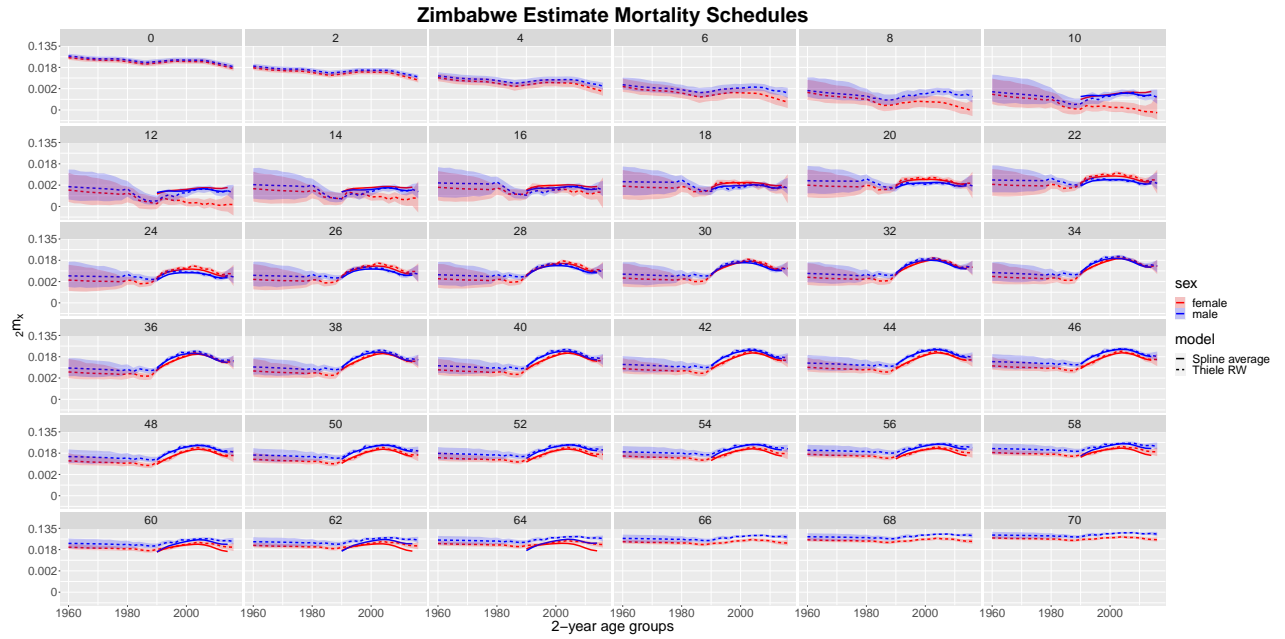Figure 4: Mortality Schedules

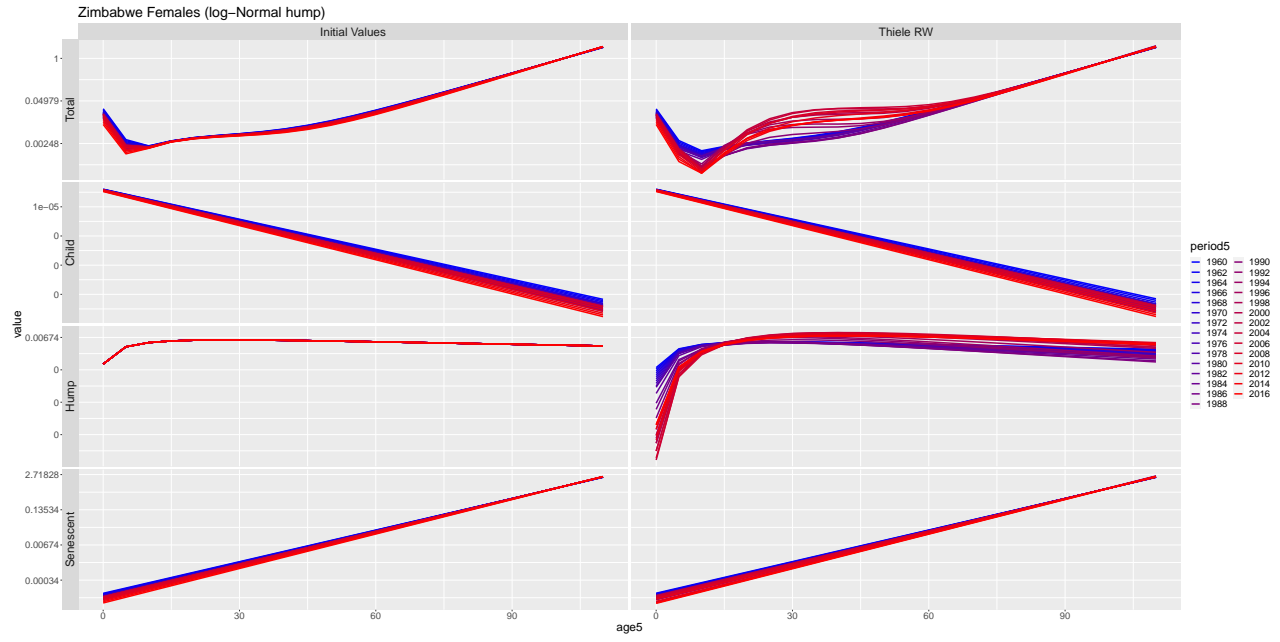Figure 5: Mortality Schedules

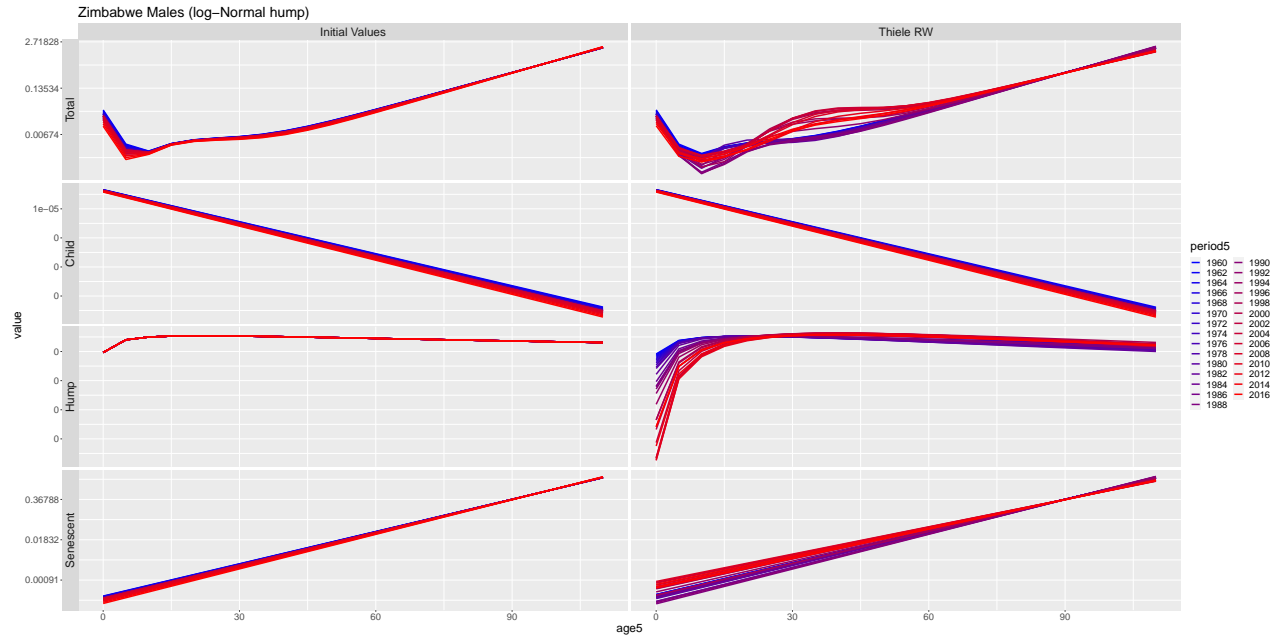Figure 6: Mortality Schedules

Figure 7: Thiele Decomposed

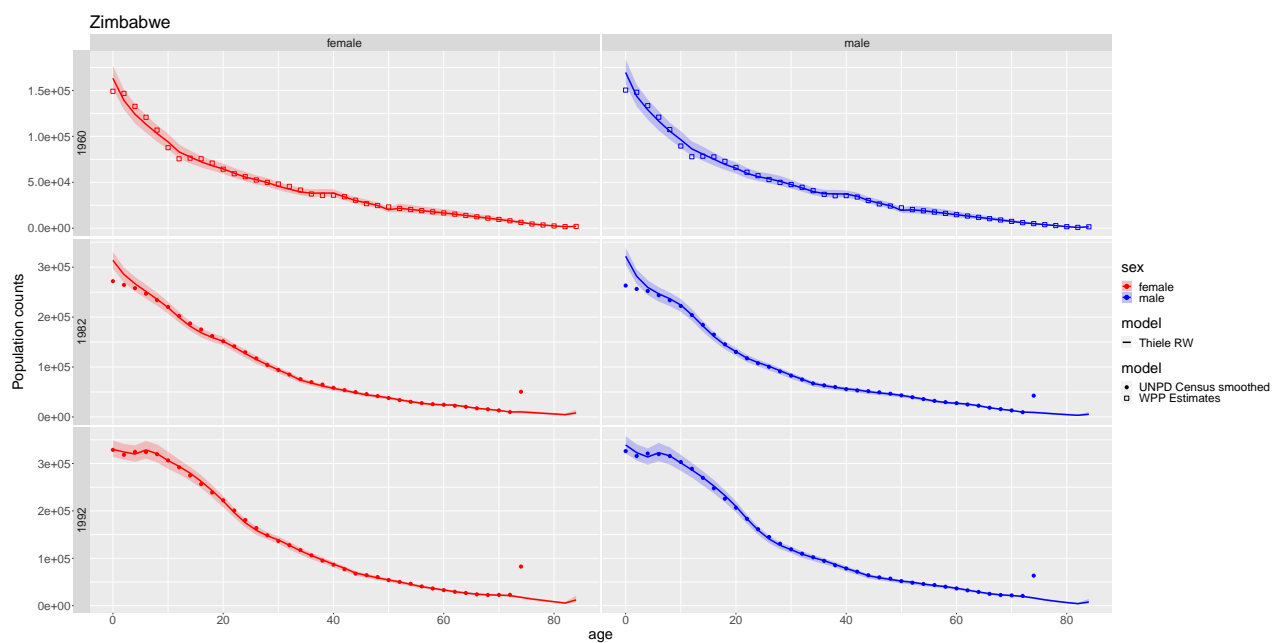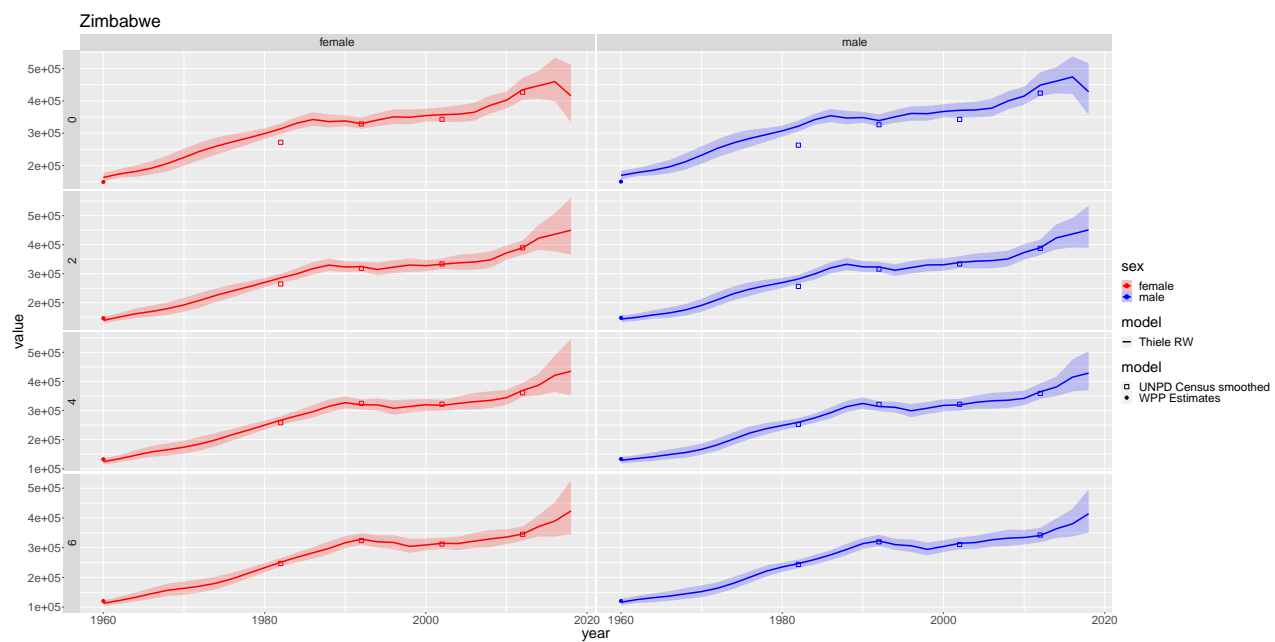
Figure 8: Thiele Decomposed

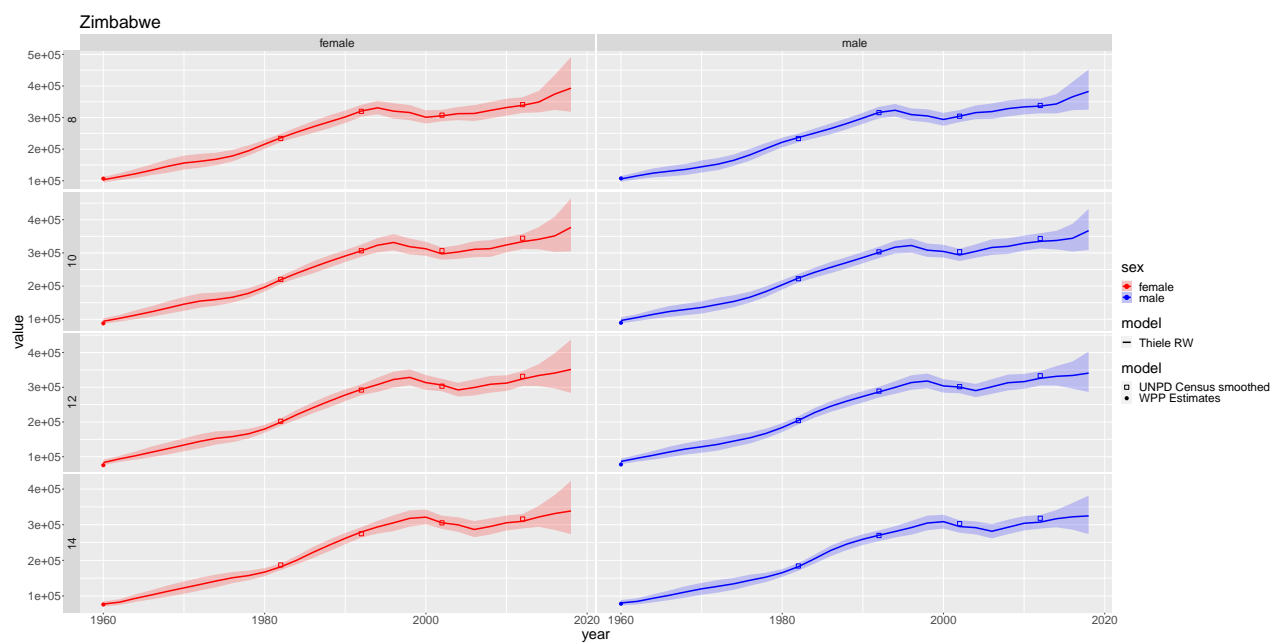6

Figure 9: Population

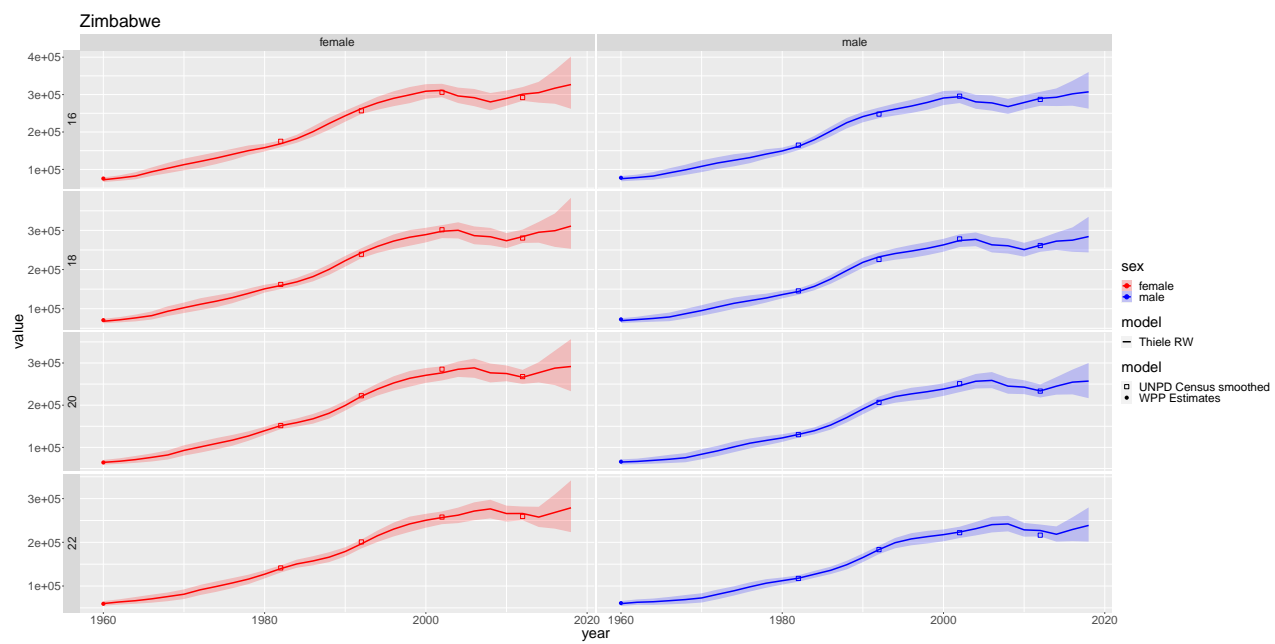Figure 10: Population

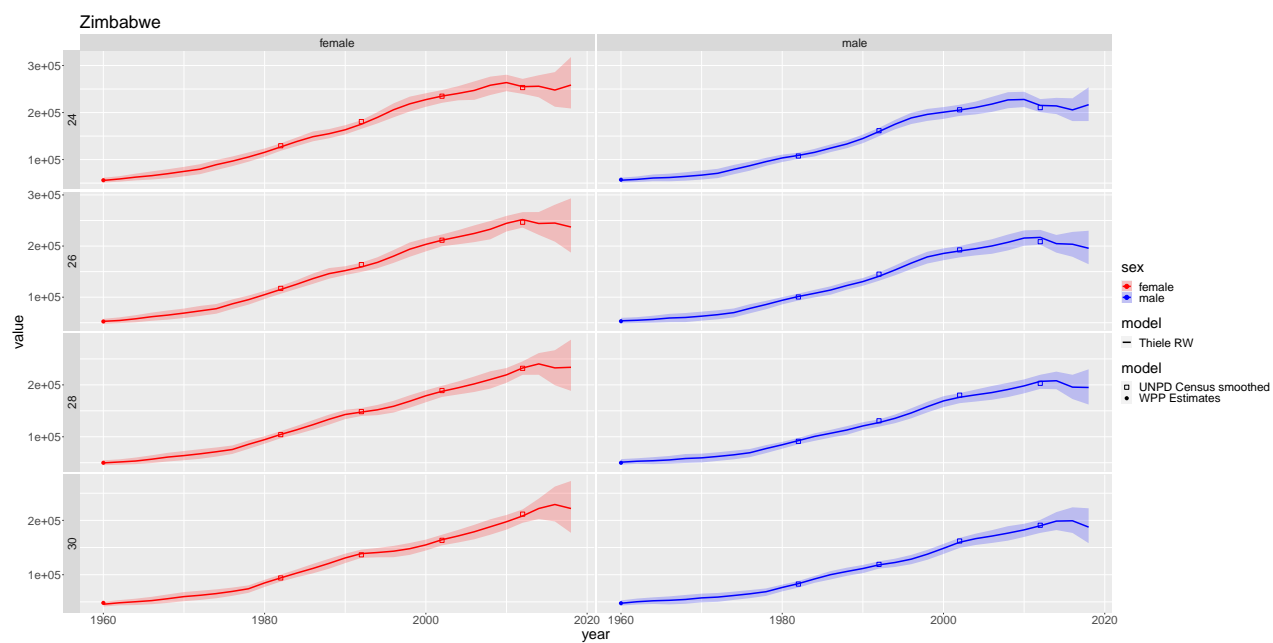Figure 11: Population

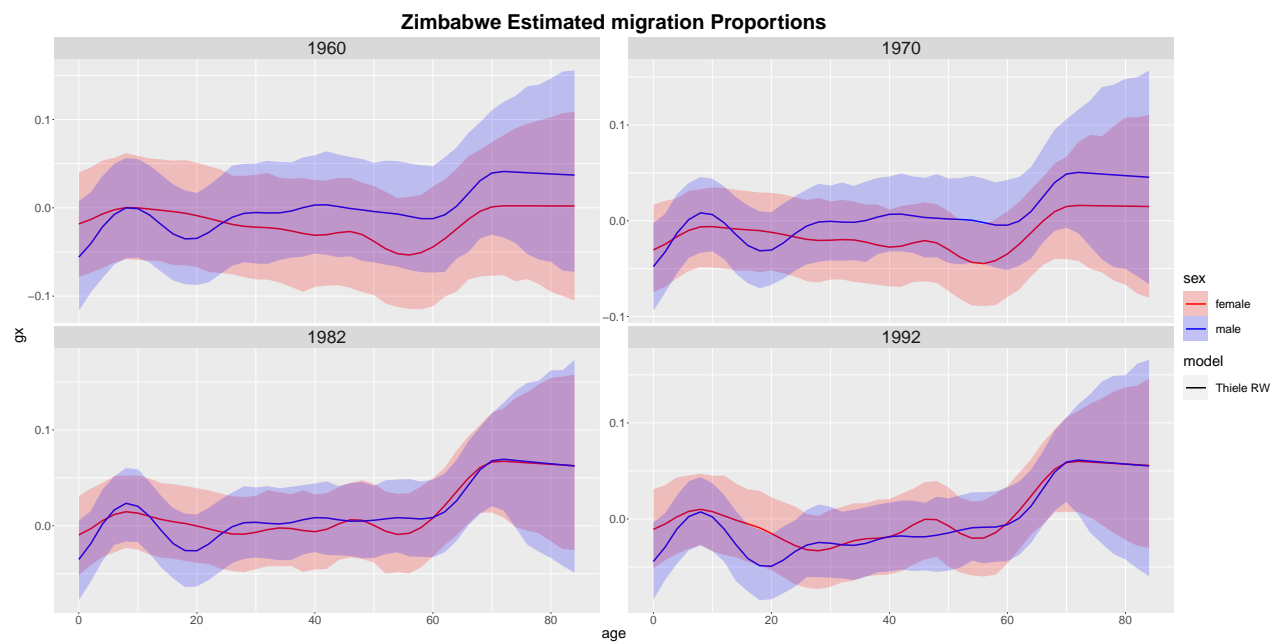
Figure 12: Population

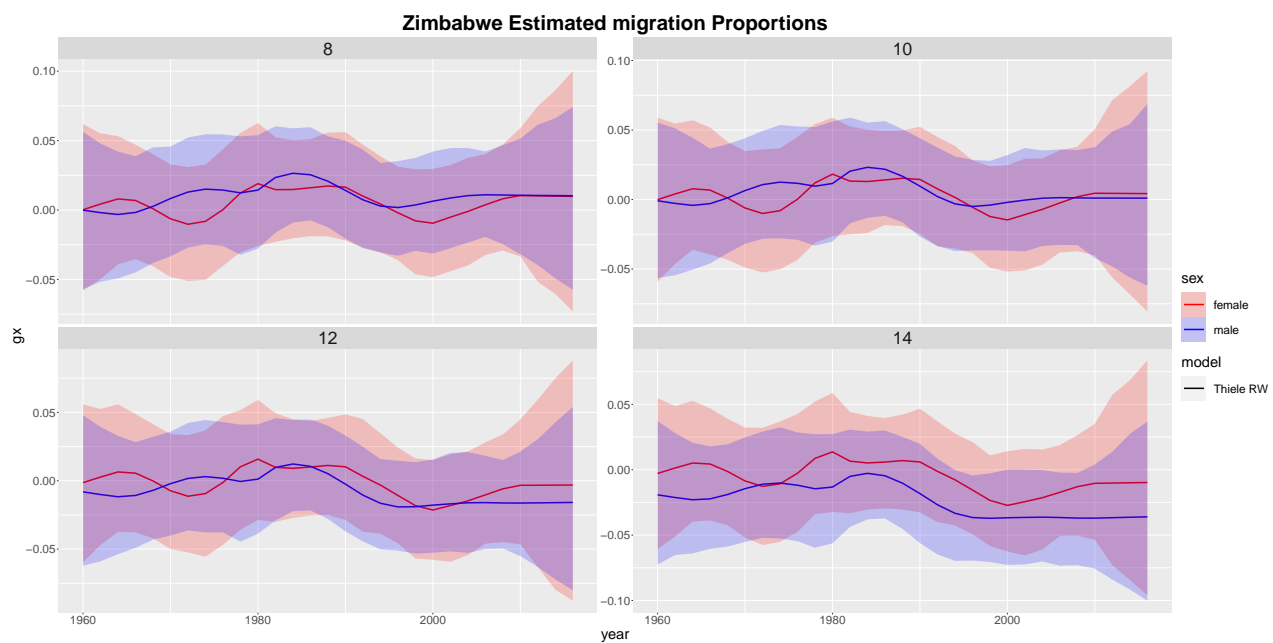Figure 13: Population
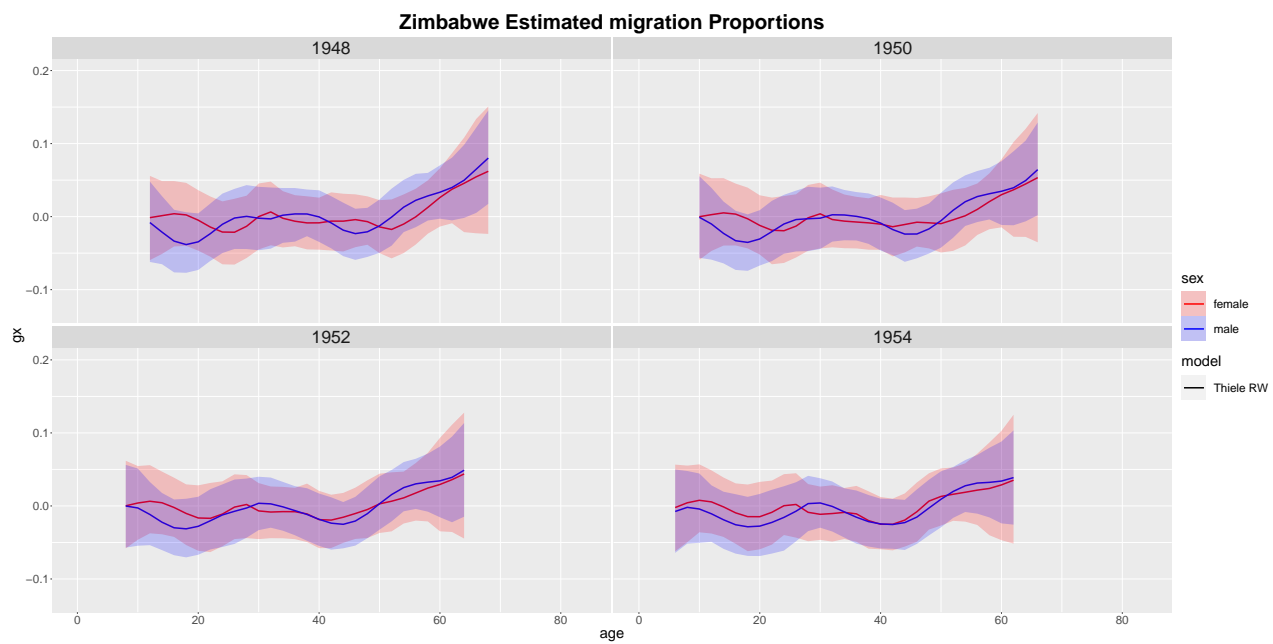

Figure 14: Migration
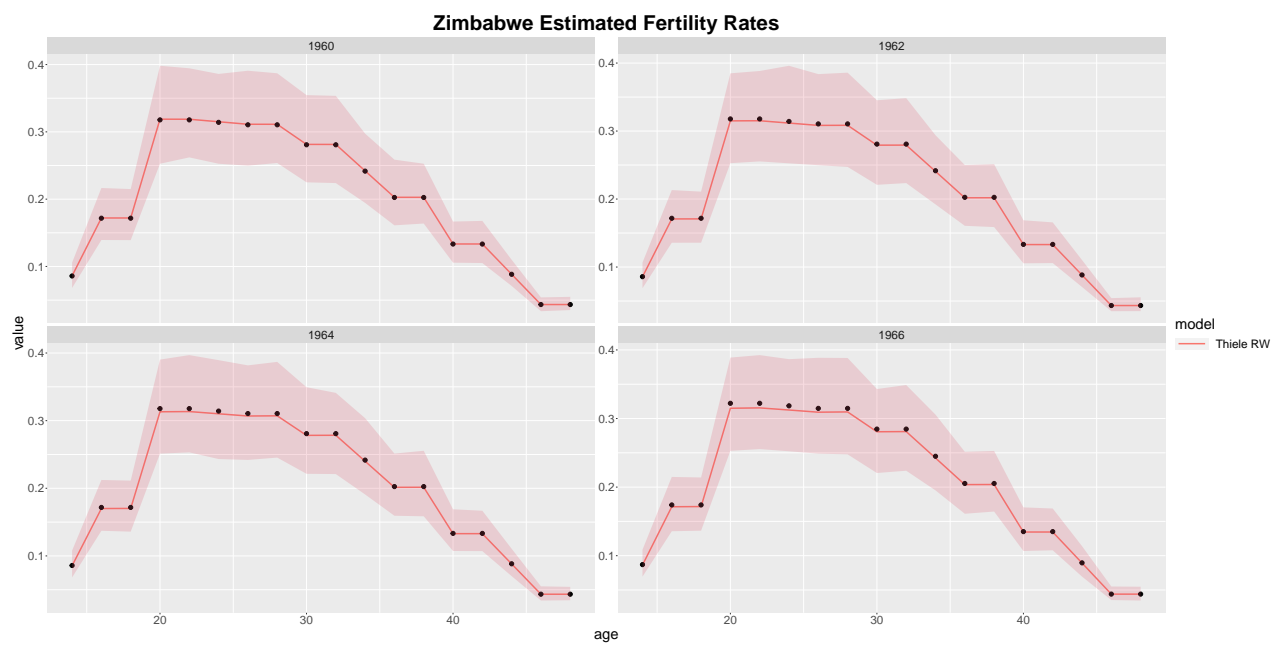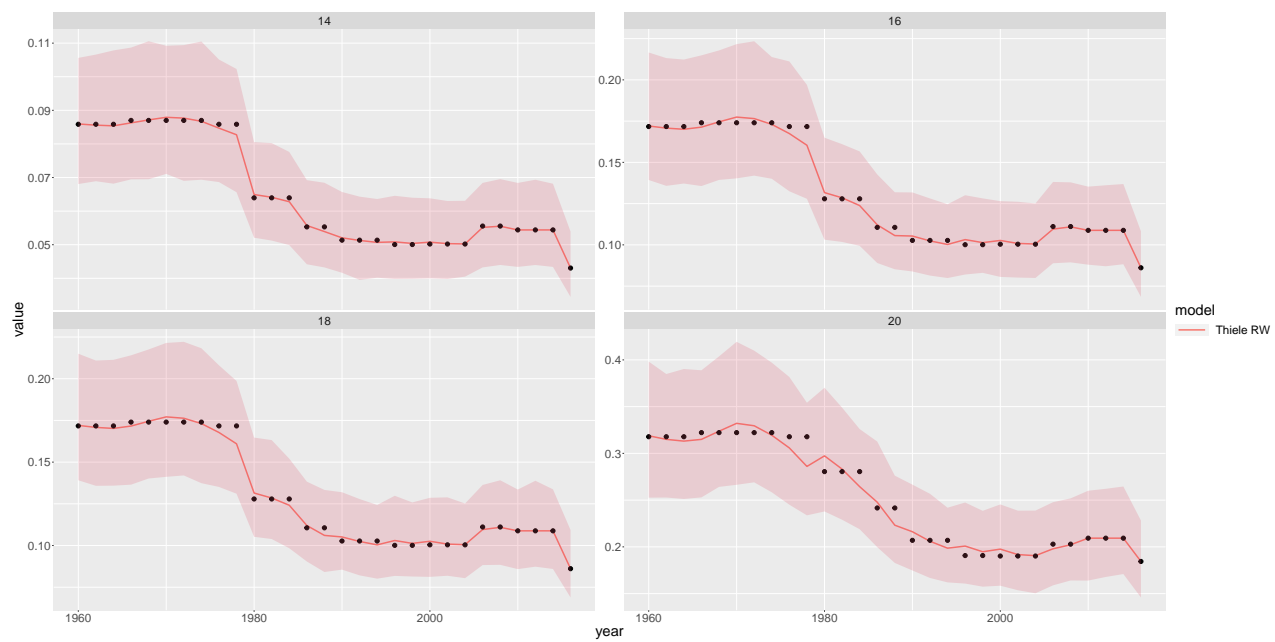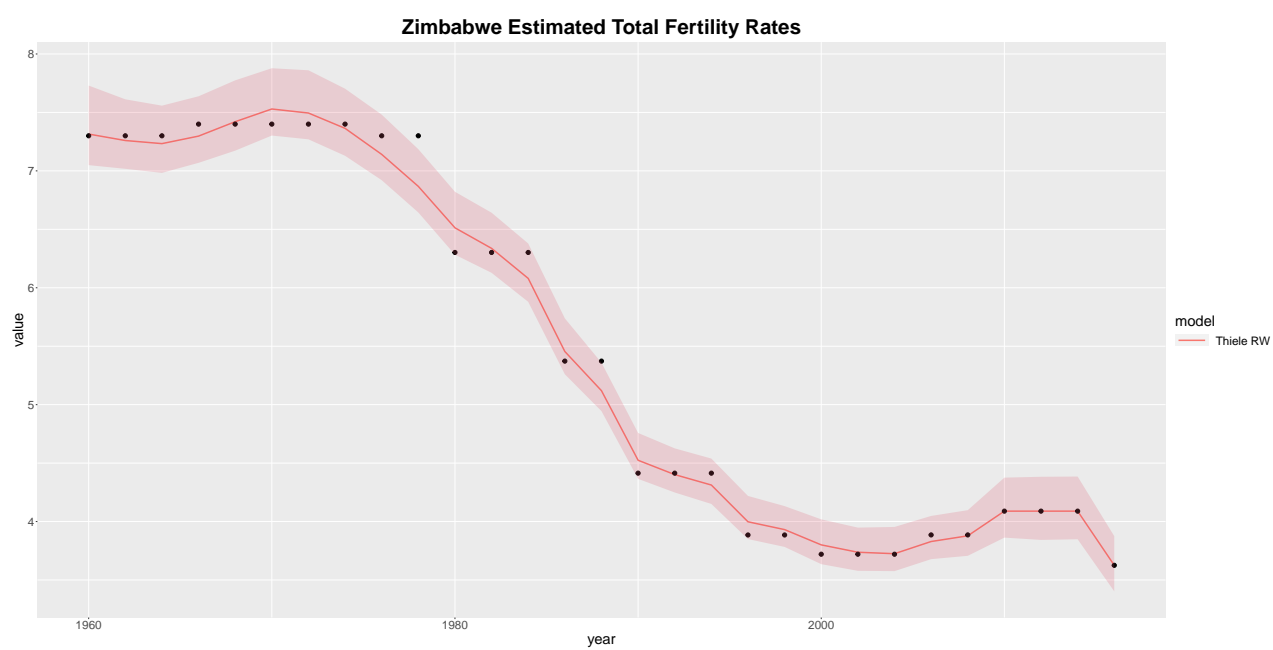
Figure 15: Migration

Figure 16: Migration

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Figure 17: Fertility

Figure 18: Fertility

Figure 19: Total Fertility