

Congo

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

## # A tibble: 86 x 3
##   age `1984` `2007`
##   <dbl> <dbl> <dbl>
## 1     0 35780. 63134
## 2     1 32394. 55440.
## 3     2 31853. 55413.
## 4     3 31119. 53394.
## 5     4 30523. 52527
## 6     5 30052. 50909.
## 7     6 29399. 47603.
## 8     7 28809. 45296.
## 9     8 28035. 44039.
## 10    9 27308. 41994.
## # ... with 76 more rows

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

## # A tibble: 18 x 2
##   age `1974`
##   <dbl> <dbl>
## 1     0 122503.
## 2     5 100522.
## 3    10  79490.
## 4    15  63470.
## 5    20  52055.
## 6    25  43495.
## 7    30  38750.
## 8    35  37288.
## 9    40  35104.
## 10   45  31605.
## 11   50  27769.
## 12   55  22732.
## 13   60  16571.
## 14   65  10763.
## 15   70   5981.
## 16   75    790.
## 17   80   689.
## 18   85    NA

## [1] "Census Males"

## # A tibble: 86 x 3
##   age `1984` `2007`
##   <dbl> <dbl> <dbl>
## 1     0 36028. 62619
## 2     1 32784. 55570
## 3     2 32208. 55347.
## 4     3 31432. 53310.
## 5     4 30785. 52485.
## 6     5 30225. 51053.
```

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## 7      6 29484. 47942.
## 8      7 28831. 45711
## 9      8 28017. 44457
## 10     9 27260. 42360.
## # ... with 76 more rows
```

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

```
## # A tibble: 18 x 2
```

```
##   age `1974`
##   <dbl>   <dbl>
```

```
## 1      0 123393.
## 2      5 101676.
## 3     10  79713.
## 4     15  59314.
## 5     20  44571.
## 6     25  37019.
## 7     30  33944.
## 8     35  32040.
## 9     40  29112.
## 10    45  25449.
## 11    50  22298.
## 12    55  19353.
## 13    60  14853.
## 14    65   9391.
## 15    70   4895.
## 16    75    720.
## 17    80   517.
## 18    85     NA
```

Thiele log-Normal Hump Spline

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## [1] "false convergence (8)"
```

##	log_tau2_logpop_f	log_tau2_logpop_f	log_tau2_logpop_m	log_tau2_
##	5.93171889	4.70098929	5.96443559	4.
##	log_tau2_gx_m	log_lambda_gx_age_f	log_lambda_gx_age_m	log_lambda_g
##	3.51934579	7.89928348	8.11256821	7.
##	log_lambda_gx_agemtime_m	log_lambda_tp	log_lambda_tp_0_inflated_sd	log_disp
##	6.84517669	2.67454521	0.38904669	0.
##	log_marginal_prec_psi_f	log_marginal_prec_A_f	log_marginal_prec_B_f	log_marginal_pr
##	6.80022441	6.79306075	6.83245756	6.
##	log_marginal_prec_B_m	log_lambda_phi_f	log_lambda_psi_f	log_lambda_
##	3.30888549	4.30865507	4.30788741	4.
##	log_lambda_A_f	log_lambda_B_f	log_lambda_phi_m	log_lamb
##	4.30670443	4.30760177	4.30904464	4.
##	log_lambda_epsilon_m	log_lambda_A_m	log_lambda_B_m	logit_lambda_slo
##	3.33525637	4.30452654	3.91078206	-0.
##	logit_lambda_slope_rho_m	logit_delta_slope_rho_m	logit_epsilon_slope_rho_m	
##	0.06780061	2.16102812	3.06265488	

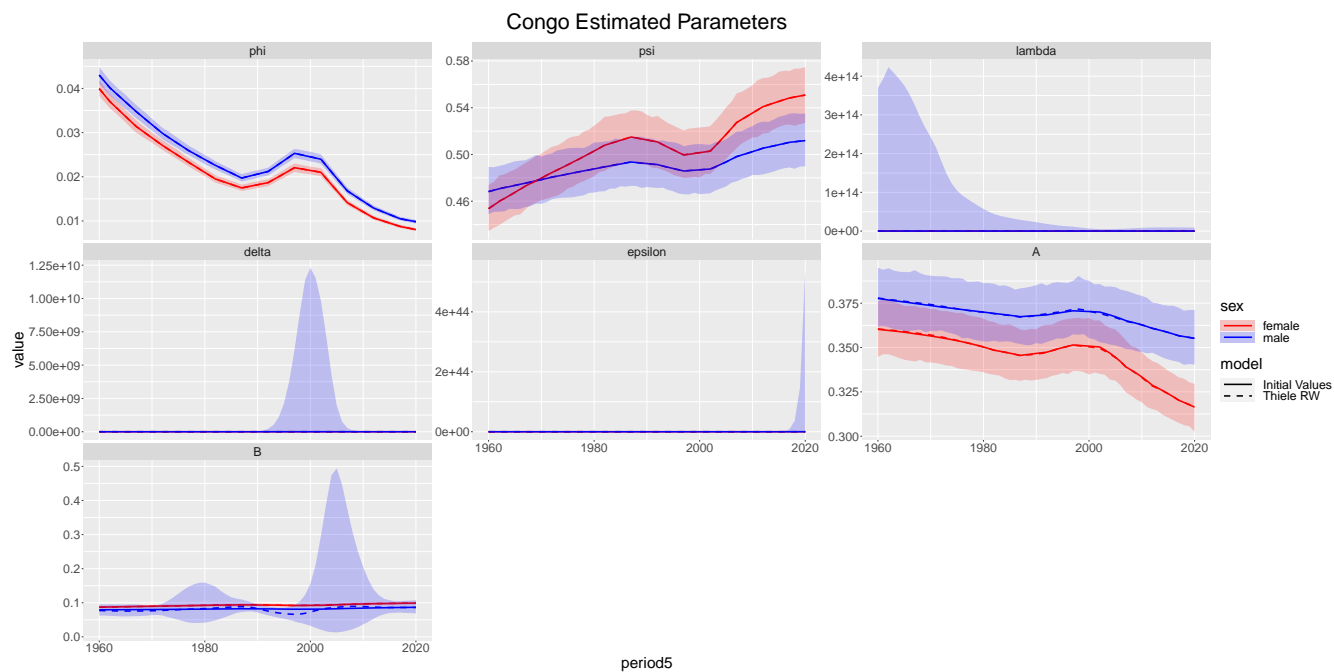


Figure 1: Estimated parameters

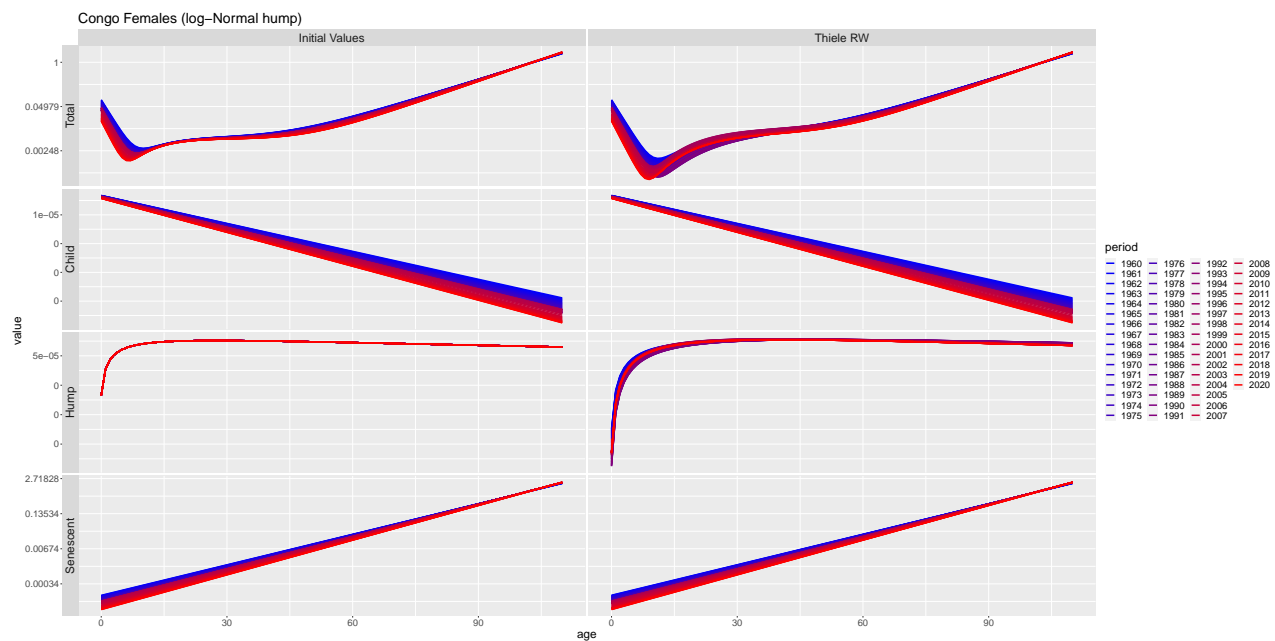


Figure 2: Thiele Decomposed

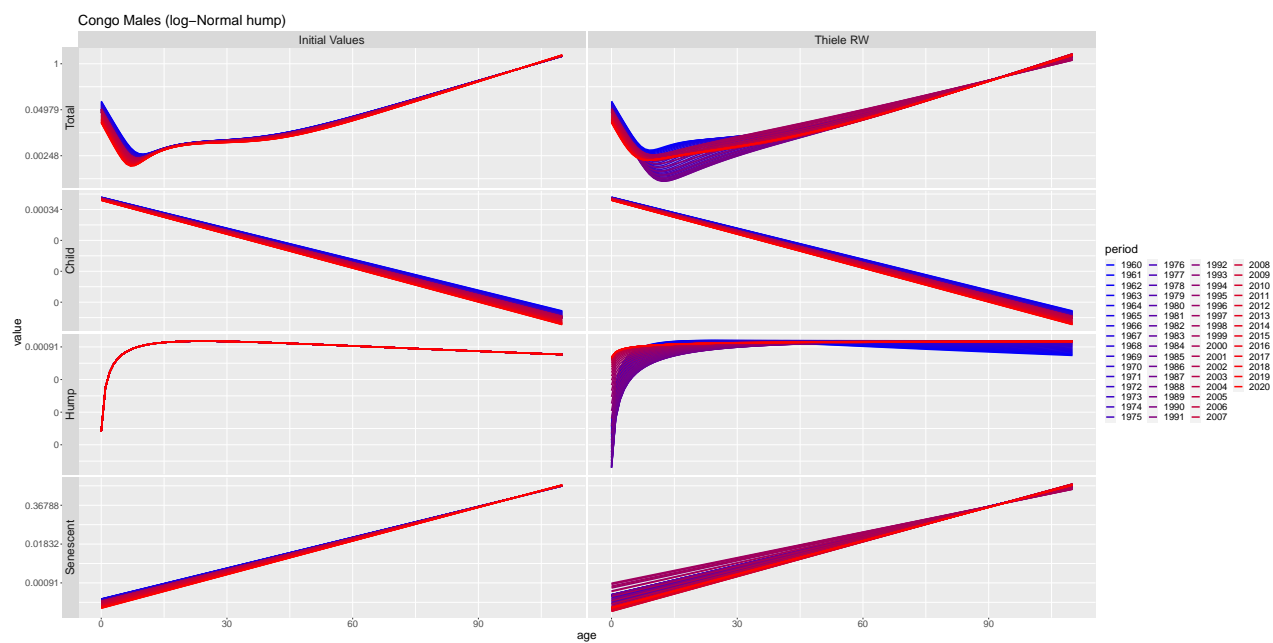


Figure 3: Thiele Decomposed

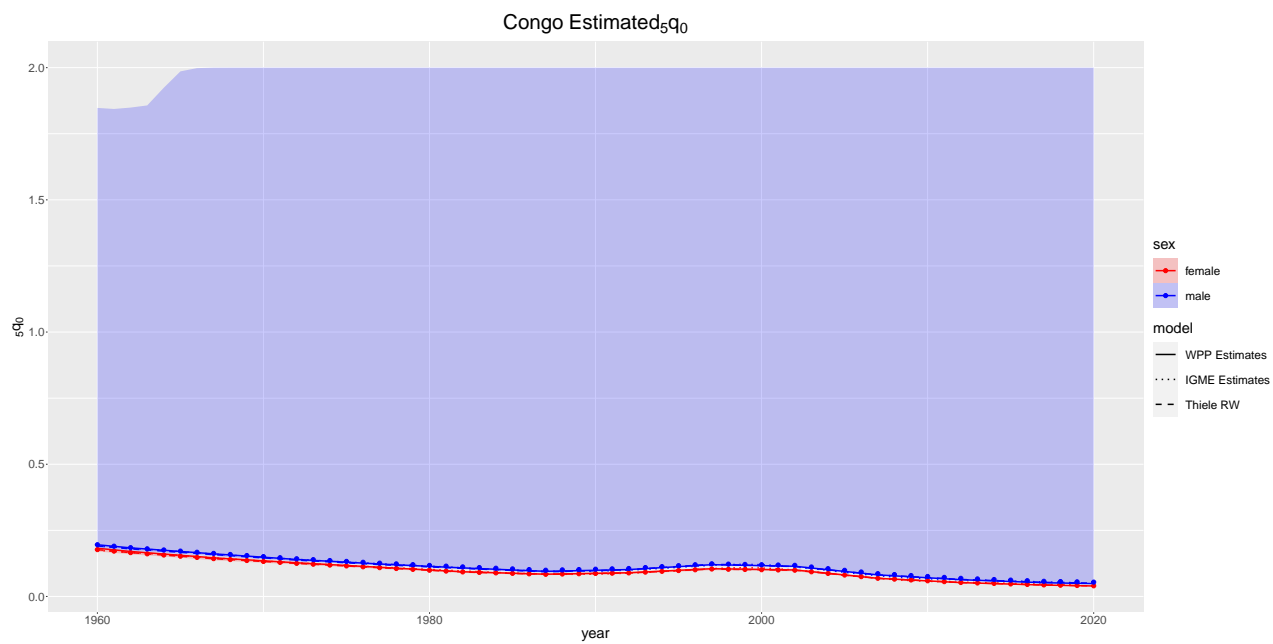


Figure 4: Estimated ${}_5q_0$

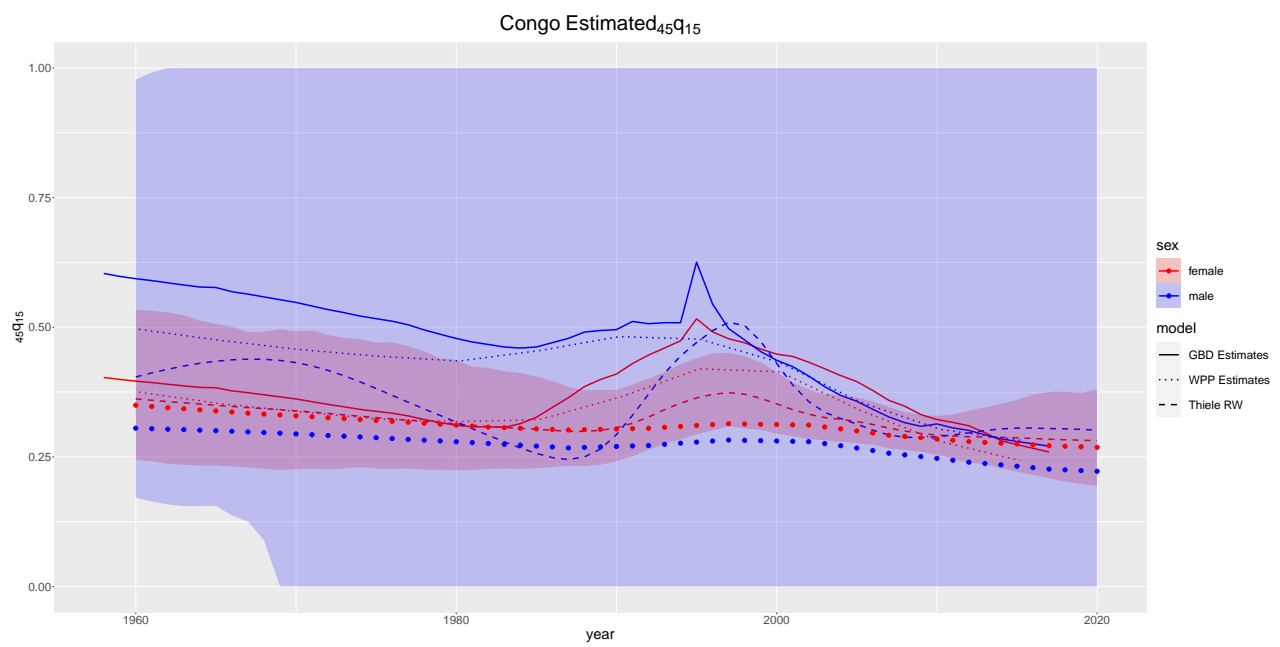


Figure 5: Estimated $_{45}q_{15}$

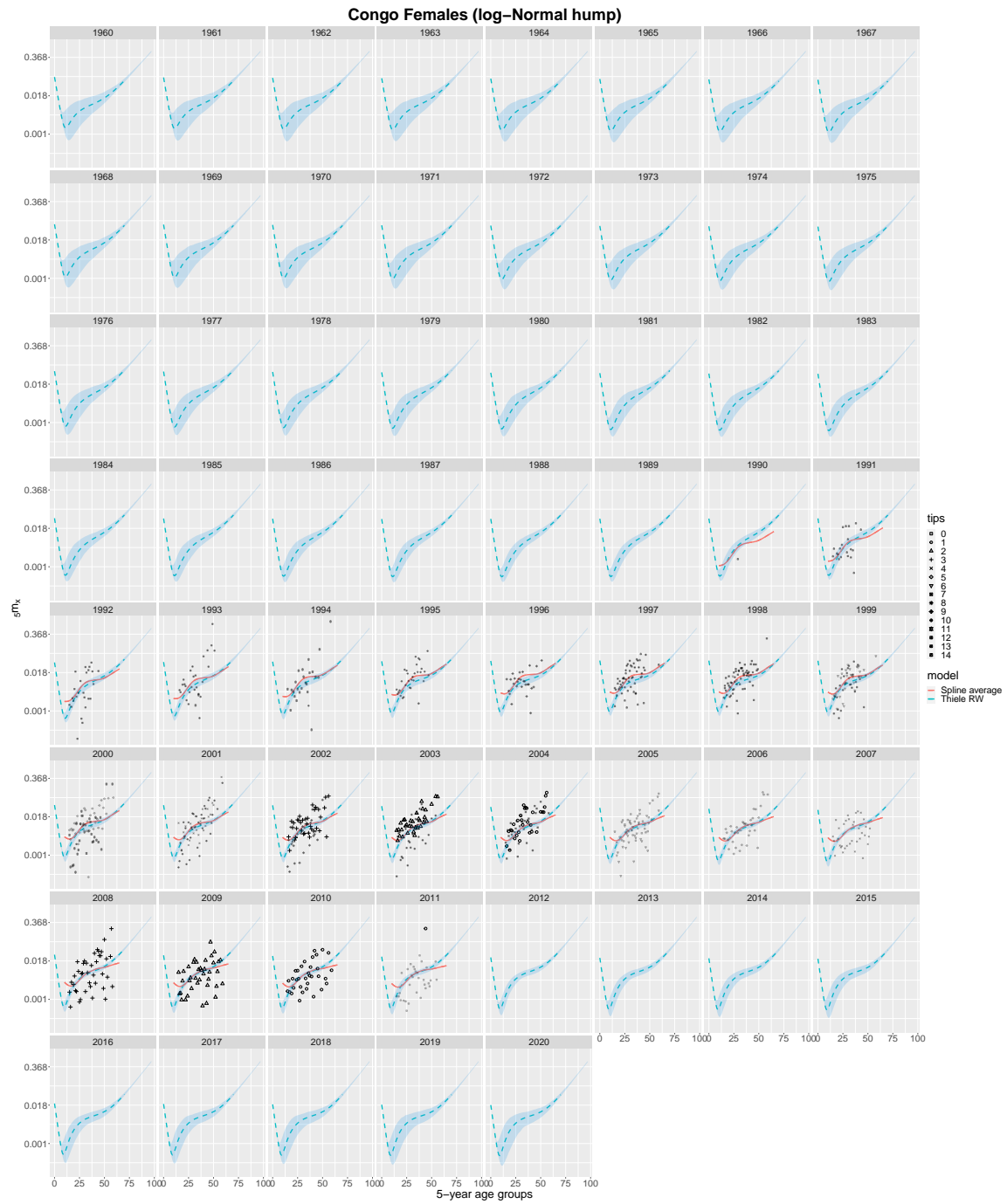


Figure 6: Mortality Schedules

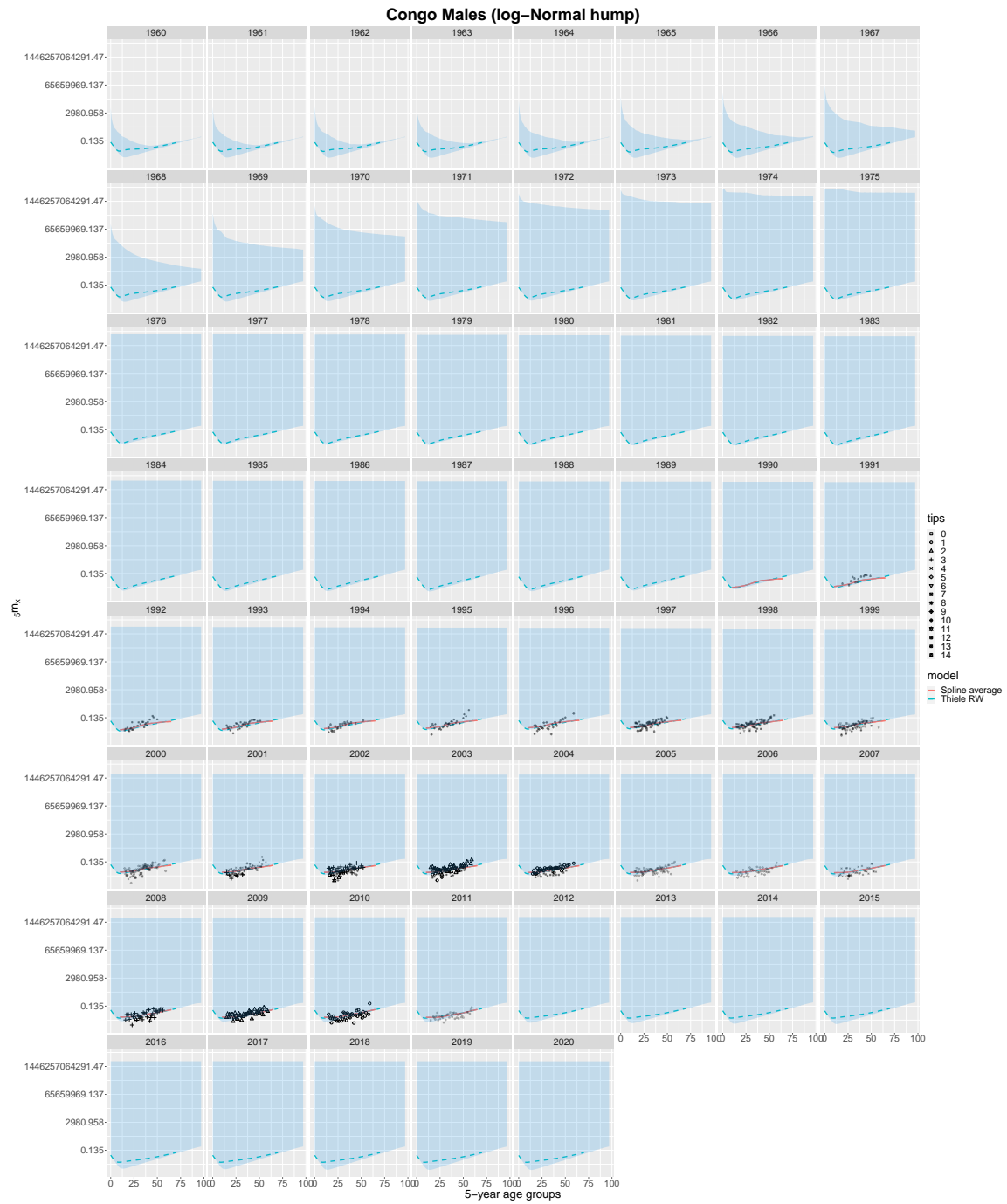


Figure 7: Mortality Schedules

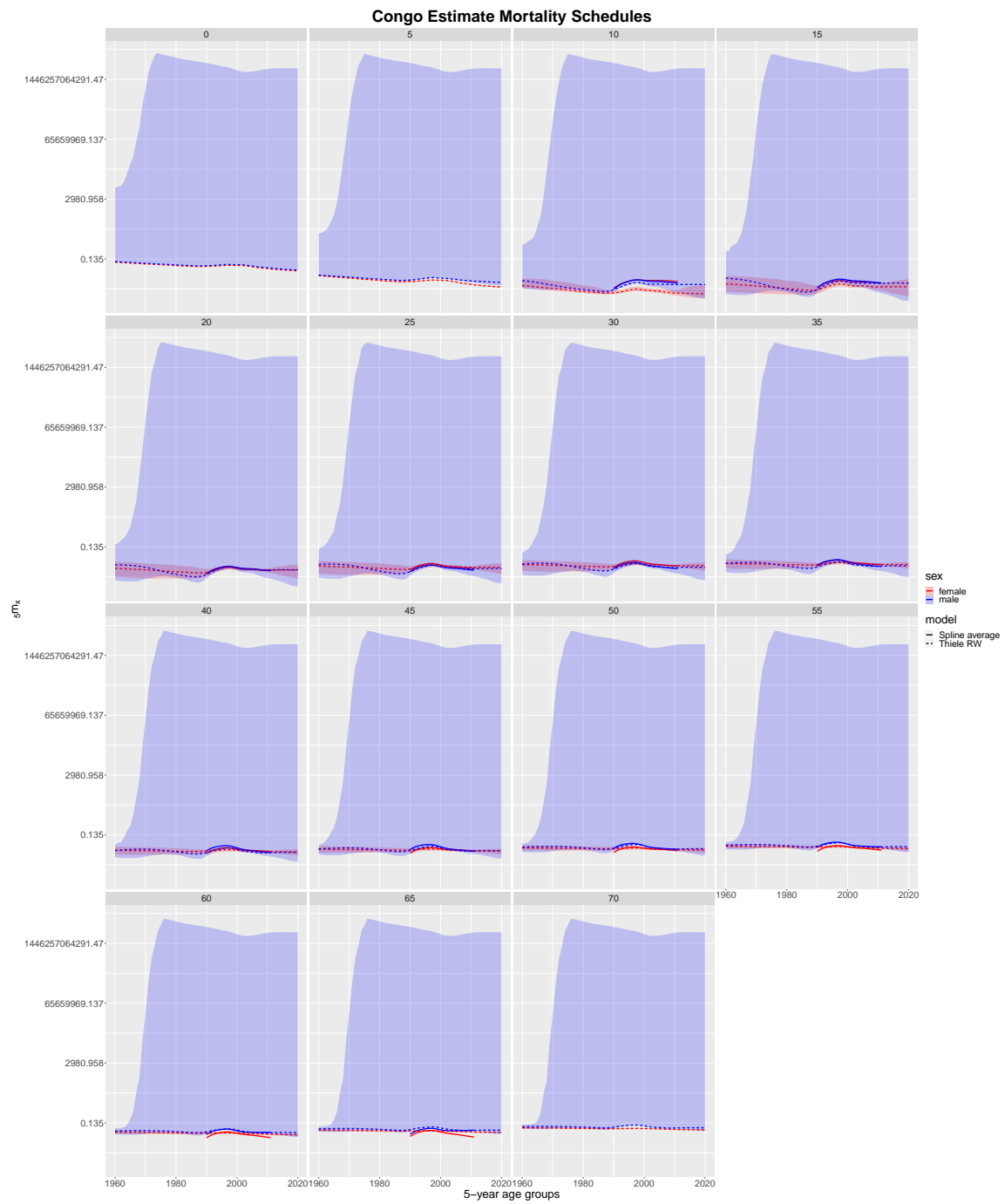


Figure 8: Mortality Schedules

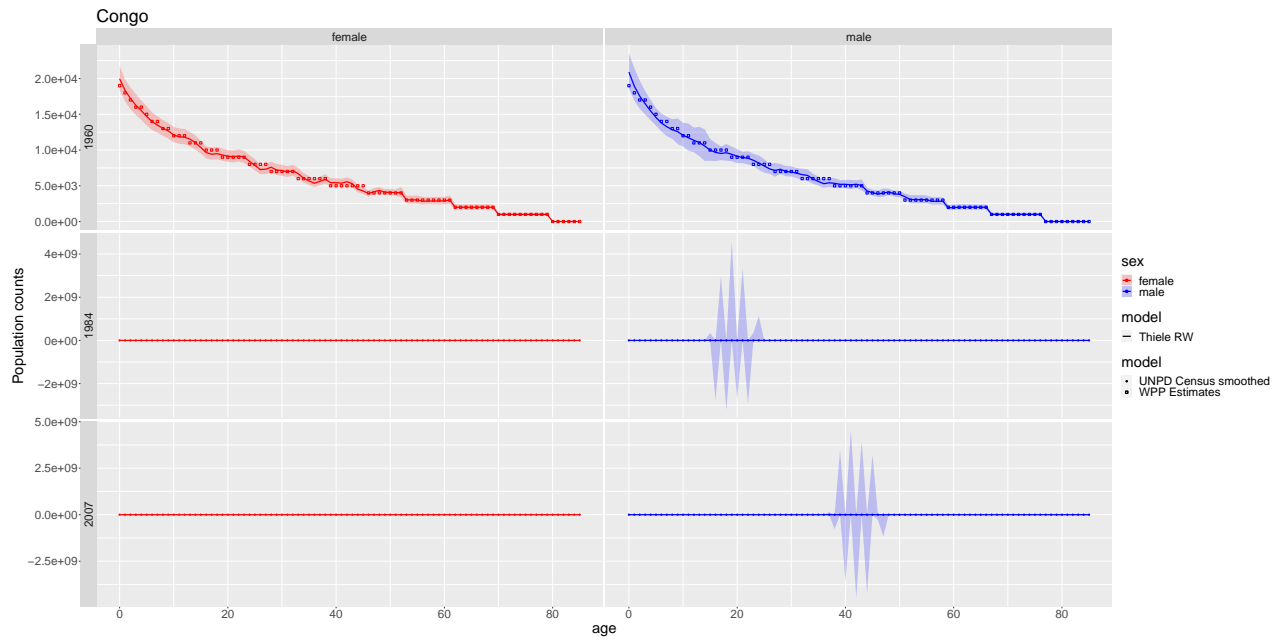


Figure 9: Population

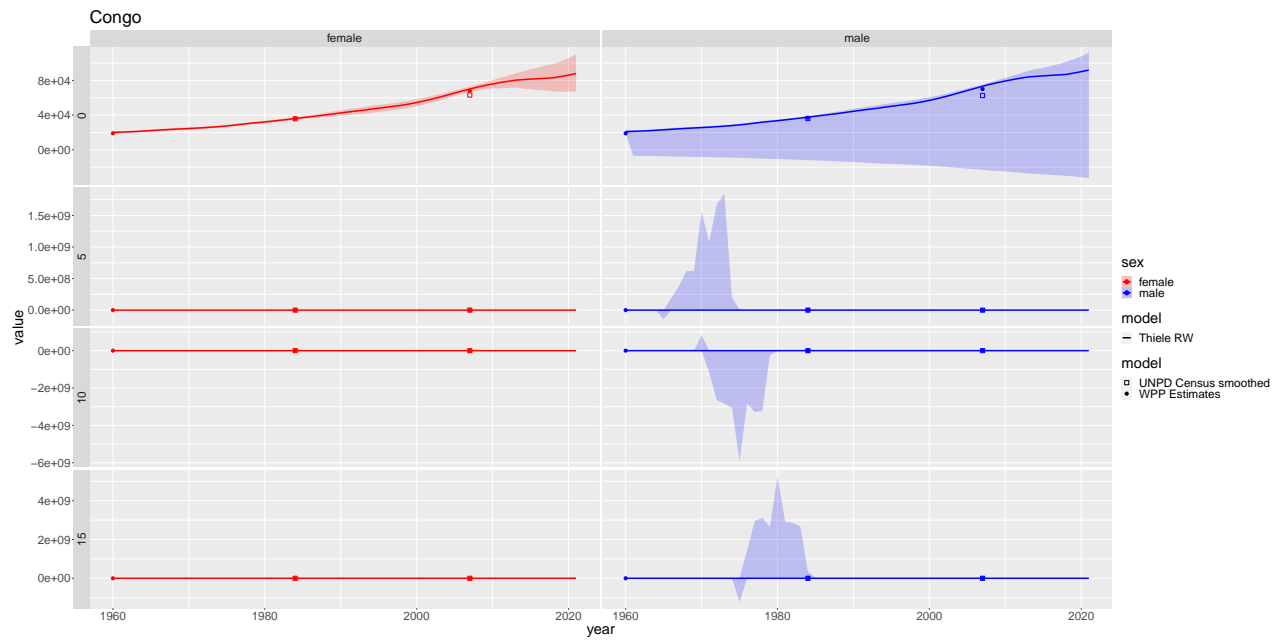


Figure 10: Population

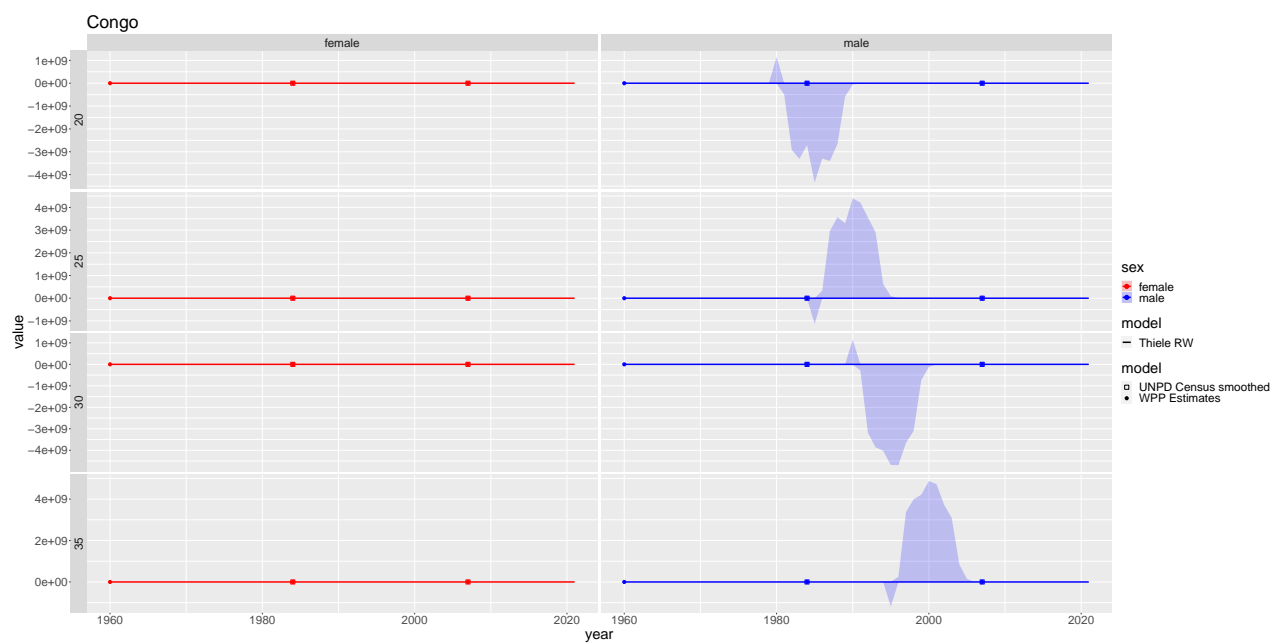


Figure 11: Population

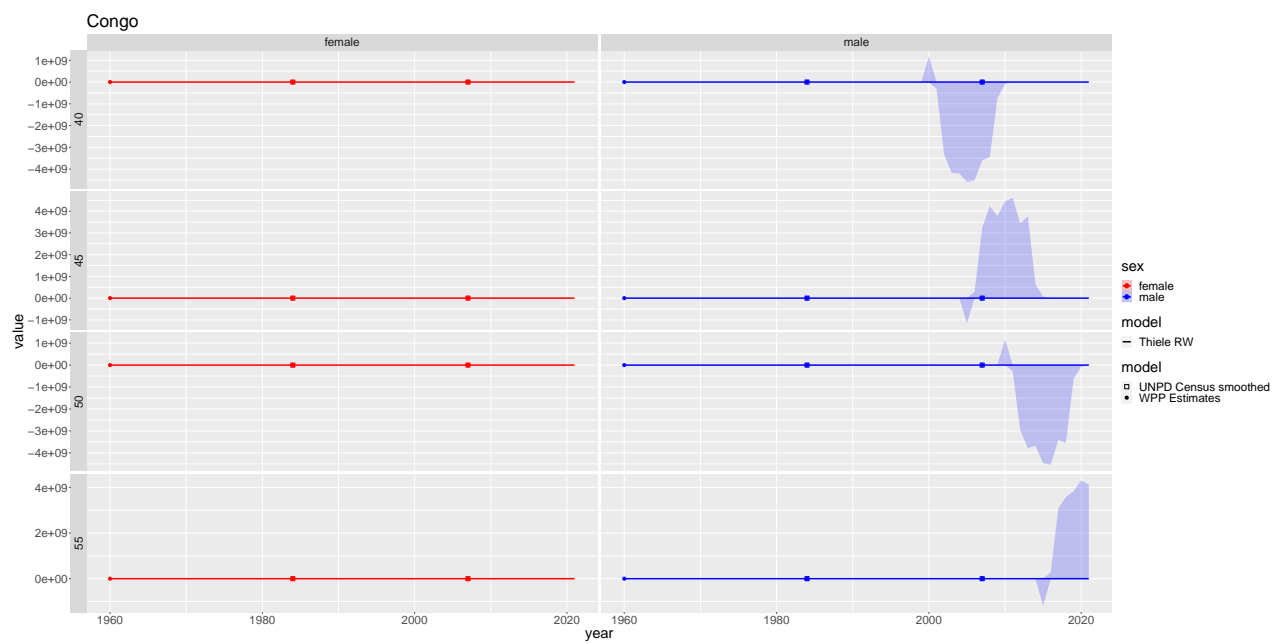


Figure 12: Population



Figure 13: Population

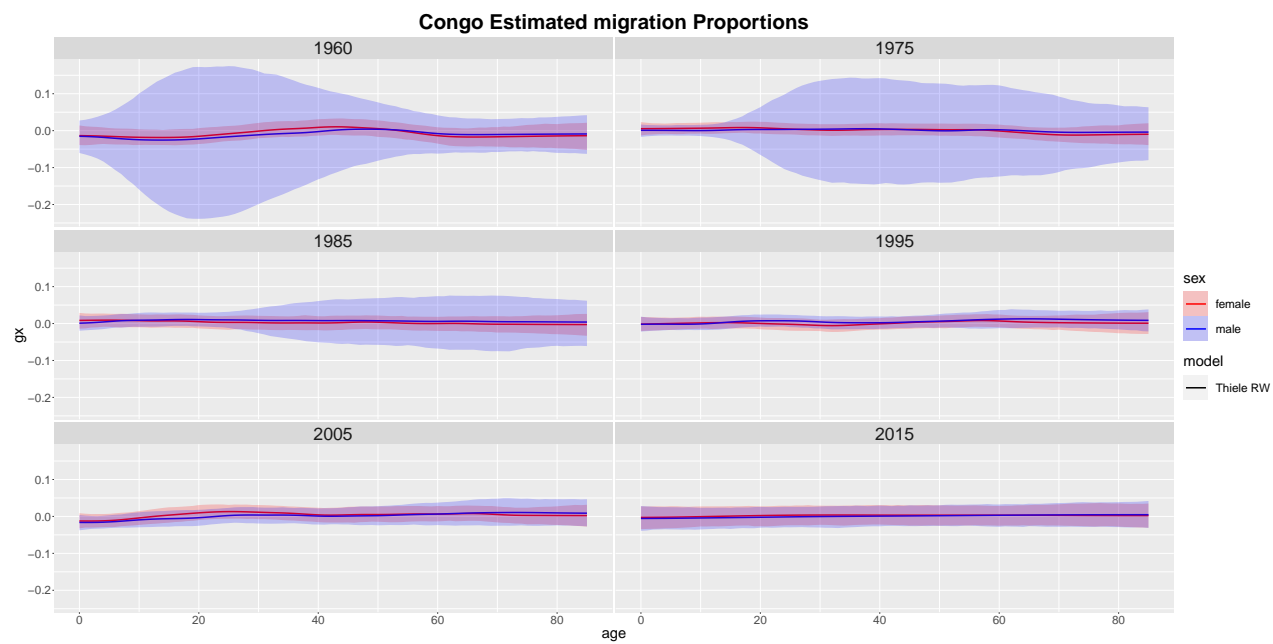


Figure 14: Migration

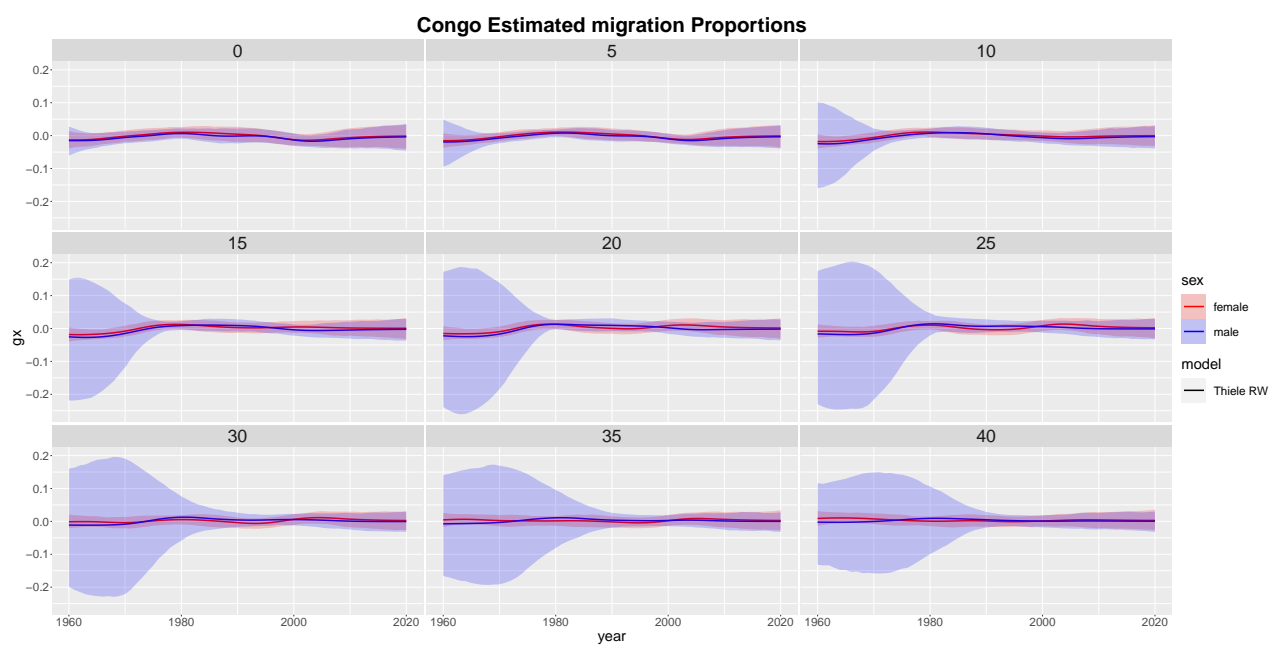


Figure 15: Migration

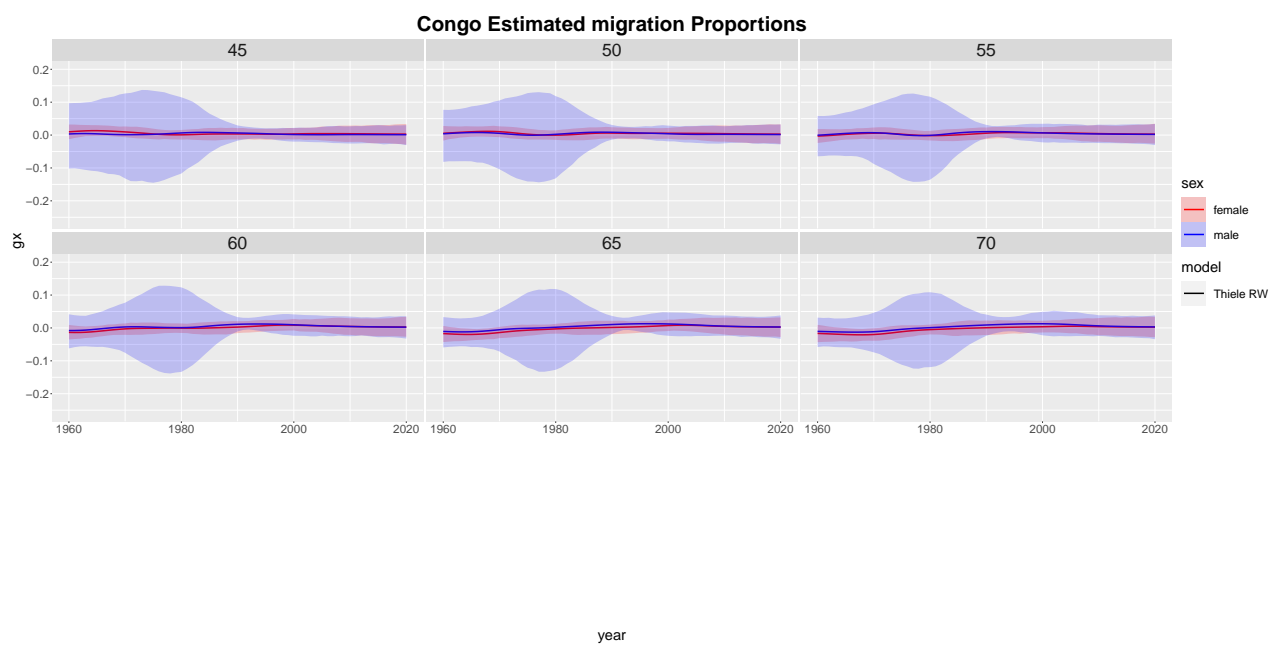


Figure 16: Migration

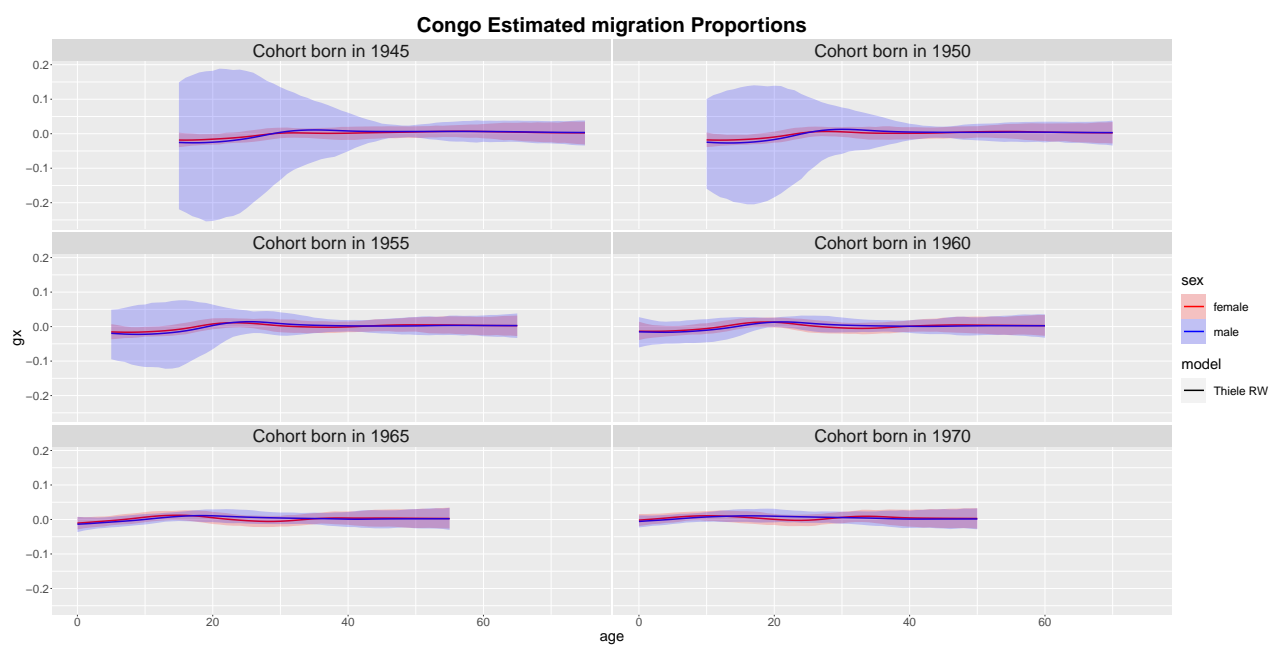


Figure 17: Migration

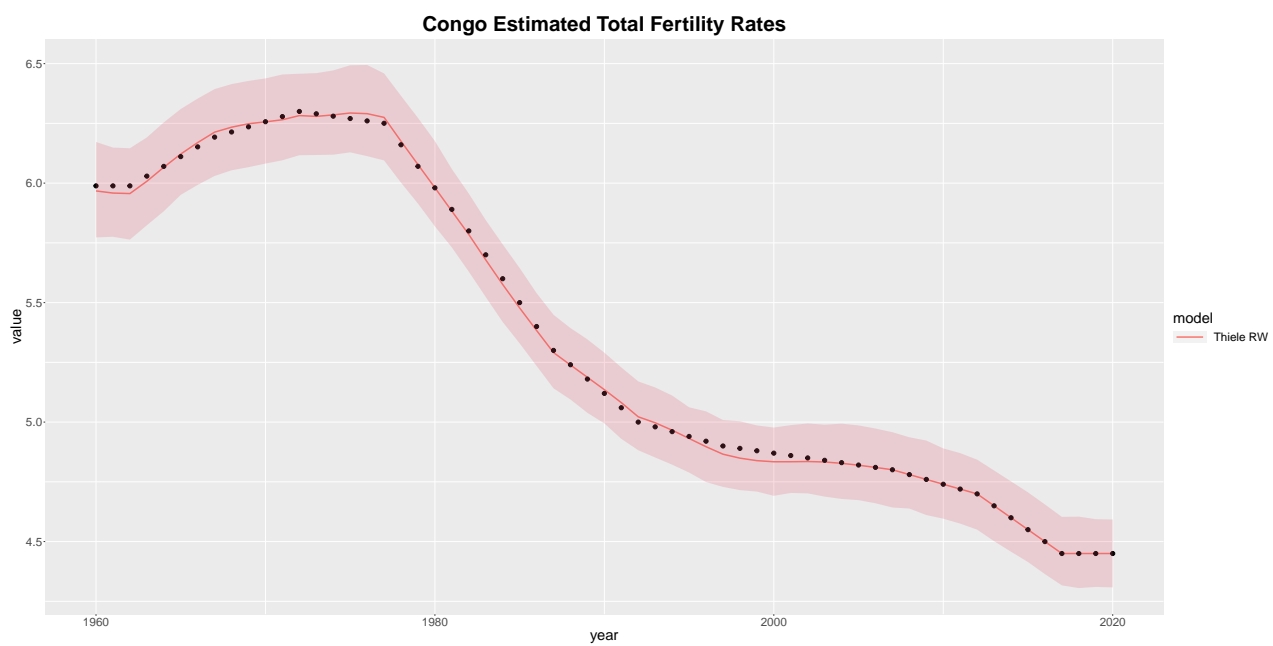


Figure 18: Total Fertility

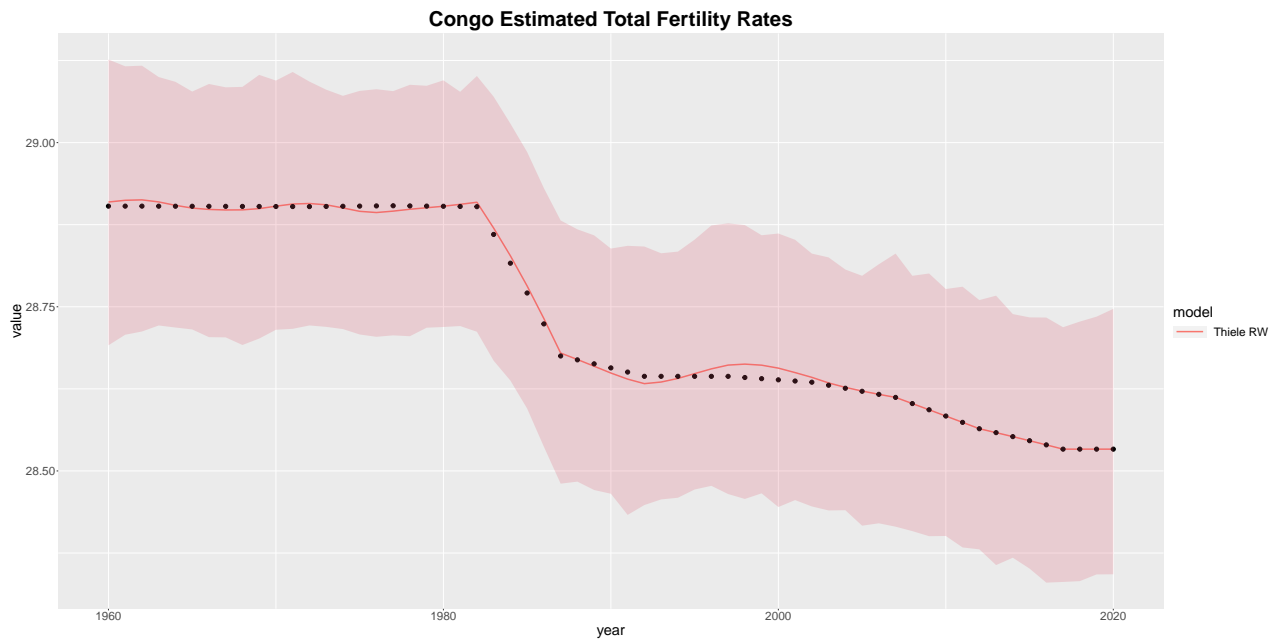


Figure 19: Mean age at births

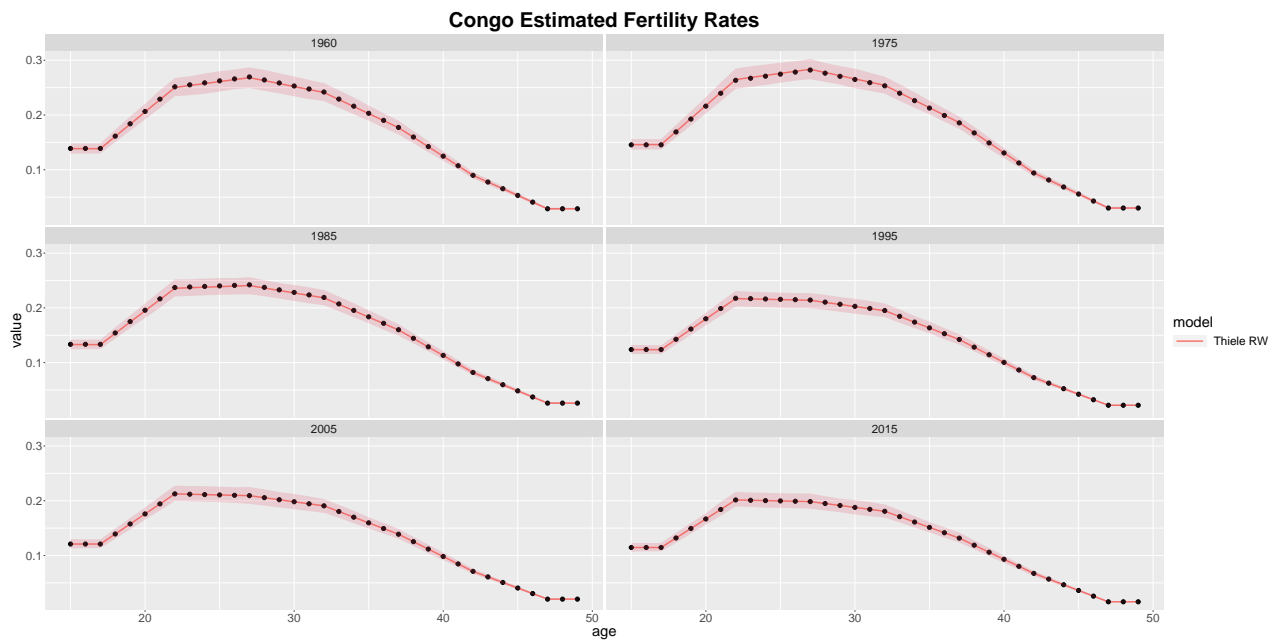


Figure 20: Fertility

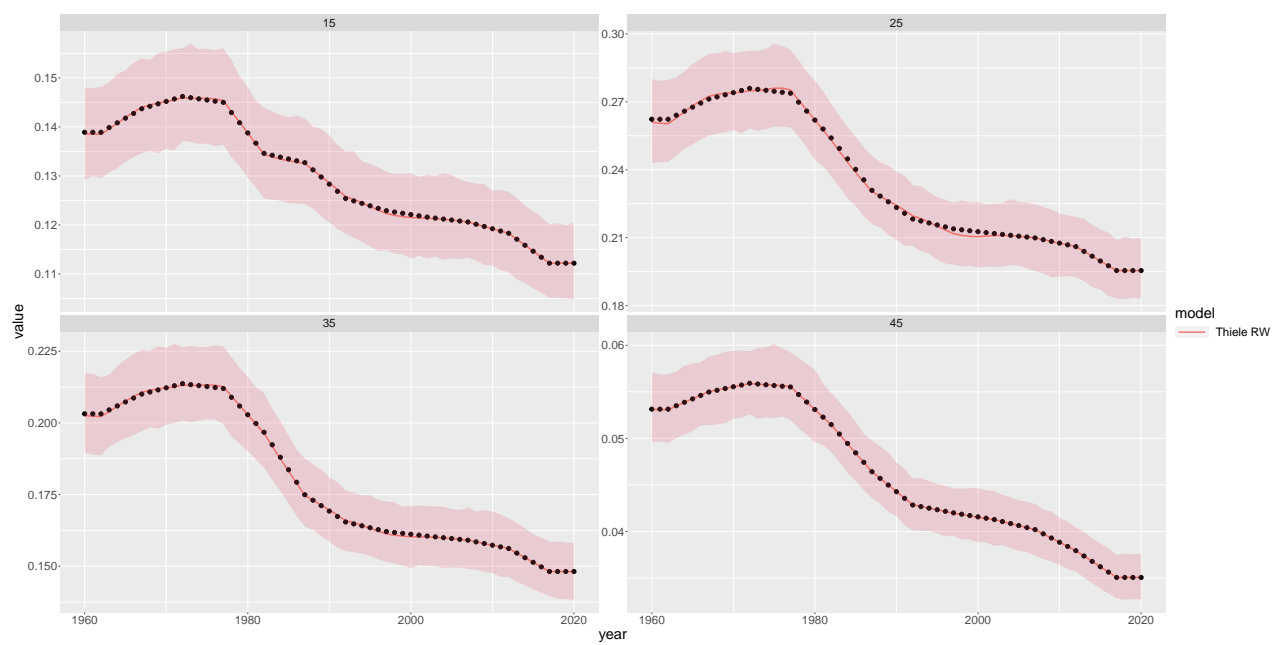


Figure 21: Fertility