

Zimbabwe

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

## # A tibble: 86 x 6
##   age `1969` `1982` `1992` `2002` `2012`
##   <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
## 1     0  215. 137199. 169638. 170997. 215623.
## 2     1  200. 134655. 159190. 172117. 211071.
## 3     2  219. 133815. 158420. 168708. 198666.
## 4     3  229. 131120. 158291. 164925. 190736.
## 5     4  240. 128619. 160494. 162274. 183611.
## 6     5  251. 126617. 162425. 159507. 177197.
## 7     6  258. 125956. 164145. 156778. 173472.
## 8     7  261. 125351. 166412. 155377. 171651.
## 9     8  262. 124105. 167841. 153895. 169450.
## 10    9  259. 118378. 165018. 153789. 171475.
## # ... with 76 more rows

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

## # A tibble: 18 x 2
##   age `1969`
##   <dbl> <dbl>
## 1     0 1100.
## 2     5 1252.
## 3    10 1181.
## 4    15  935.
## 5    20  709.
## 6    25  541.
## 7    30  437.
## 8    35  379.
## 9    40  303.
## 10   45  227.
## 11   50  168.
## 12   55  124.
## 13   60   95.4
## 14   65   67.1
## 15   70   35.5
## 16   75   17.0
## 17   80    9.26
## 18   85   13.4

## [1] "Census Males"

## # A tibble: 86 x 6
##   age `1969` `1982` `1992` `2002` `2012`
##   <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
## 1     0  238. 133357. 168079. 170637. 213895.
## 2     1  232. 129754. 158096. 172216. 210140.
## 3     2  231. 129163. 156962. 168433. 197420.
## 4     3  235. 127343. 157057. 164960. 189835.
## 5     4  242. 125798. 159247. 162197. 182613.
## 6     5  248. 124587. 161170. 159217. 176094.
```

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## 7      6    255. 124714. 162716. 156209. 172218.
## 8      7    265. 124146. 164082. 154419. 170262.
## 9      8    271. 122838. 164791. 152264. 167883.
## 10     9    271. 117620. 161620. 152041. 170380.
## # ... with 76 more rows
```

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

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

```
##   age `1969`
##   <dbl> <dbl>
```

```
## 1     0 1156.
## 2     5 1278.
## 3    10 1207.
## 4    15  931.
## 5    20  636.
## 6    25  459.
## 7    30  389.
## 8    35  341.
## 9    40  280.
## 10   45  229.
## 11   50  186.
## 12   55  142.
## 13   60   97.1
## 14   65   60.0
## 15   70   32.4
## 16   75   15.2
## 17   80    8.24
## 18   85    7.21
```

Thiele log-Normal Hump Spline

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

| | | | | |
|----|-------------------|------------------|--------------------|-----------------|
| ## | log_tau2_logpop | log_tau2_logpop | log_tau2_logpop | log_tau2_logpop |
| ## | 4.206964445 | 6.003090142 | 4.362942390 | 5.740807419 |
| ## | log_lambda_fx | log_lambda_gx | log_dispersion | log_dispersion |
| ## | 10.545033588 | 10.874594772 | 1.192539799 | 1.184173835 |
| ## | log_lambda_tp | tp_slope | tp_params_5 | tp_params_10 |
| ## | 3.591096962 | -0.004455636 | 0.226154565 | 0.426490737 |
| ## | log_lambda_phi | log_lambda_psi | log_lambda_A | log_lambda_B |
| ## | 13.740352556 | 12.768610775 | 13.693942532 | 12.041326087 |
| ## | log_lambda_lambda | log_lambda_delta | log_lambda_epsilon | |
| ## | 1.828135883 | 4.703624972 | 3.376302654 | |

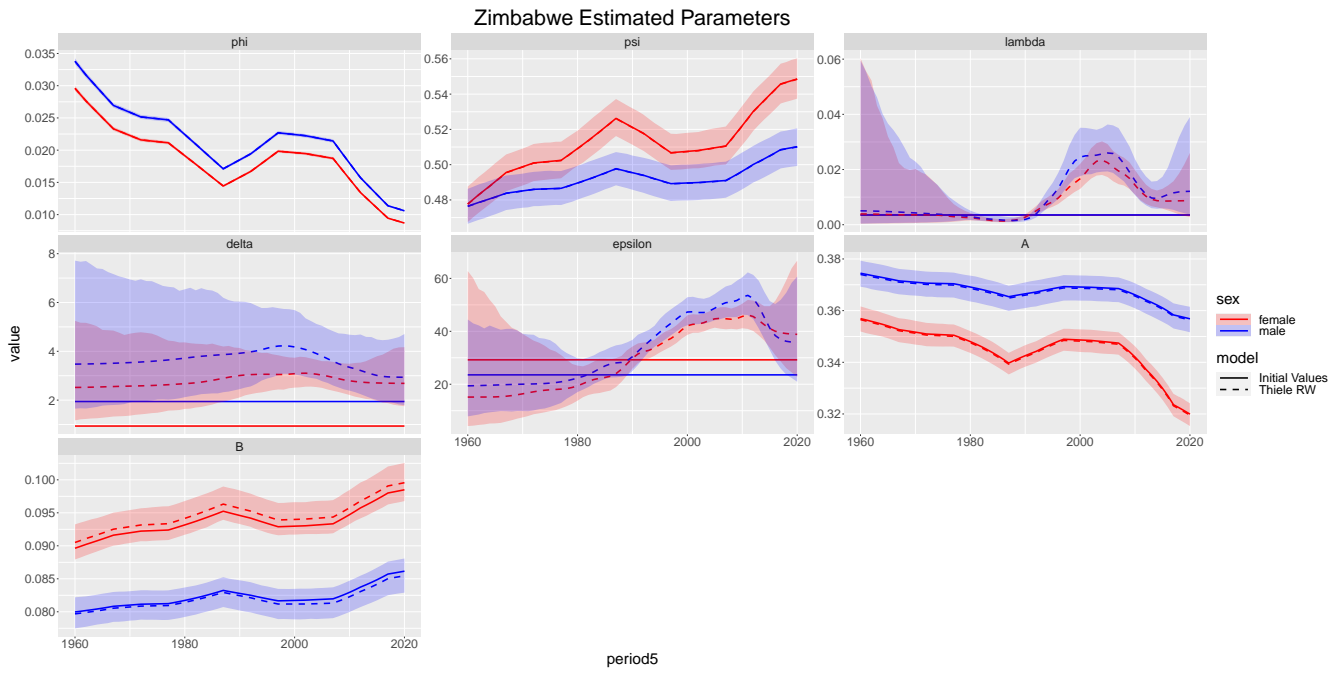


Figure 1: Estimated parameters

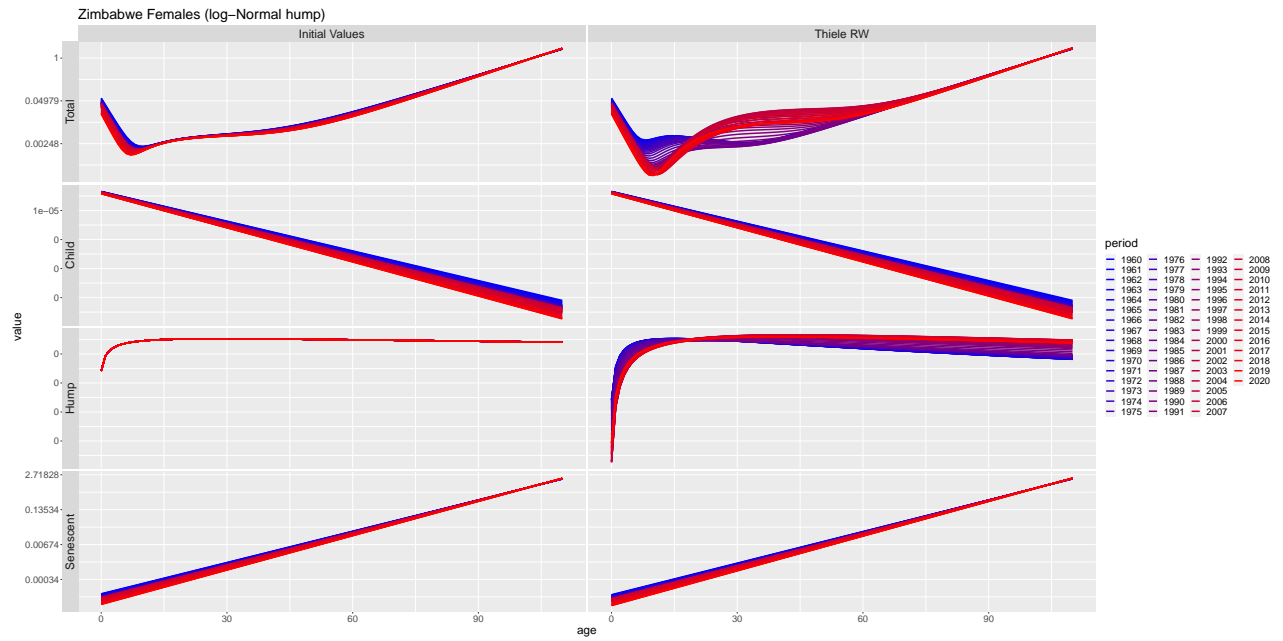


Figure 2: Thiele Decomposed

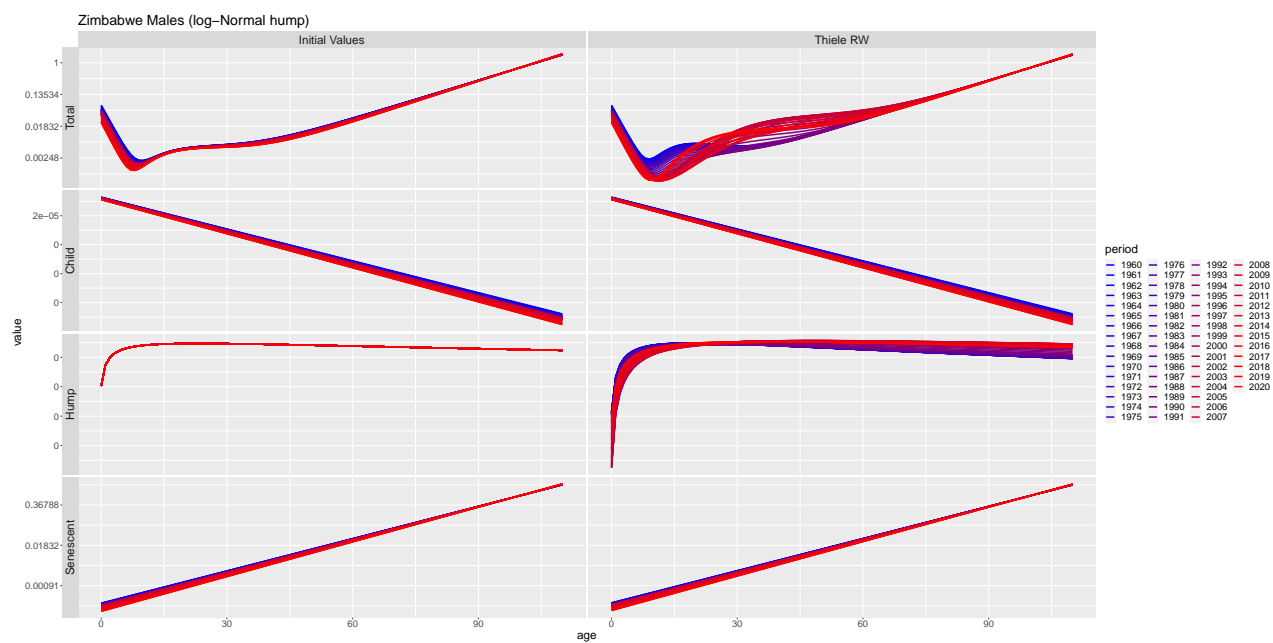


Figure 3: Thiele Decomposed

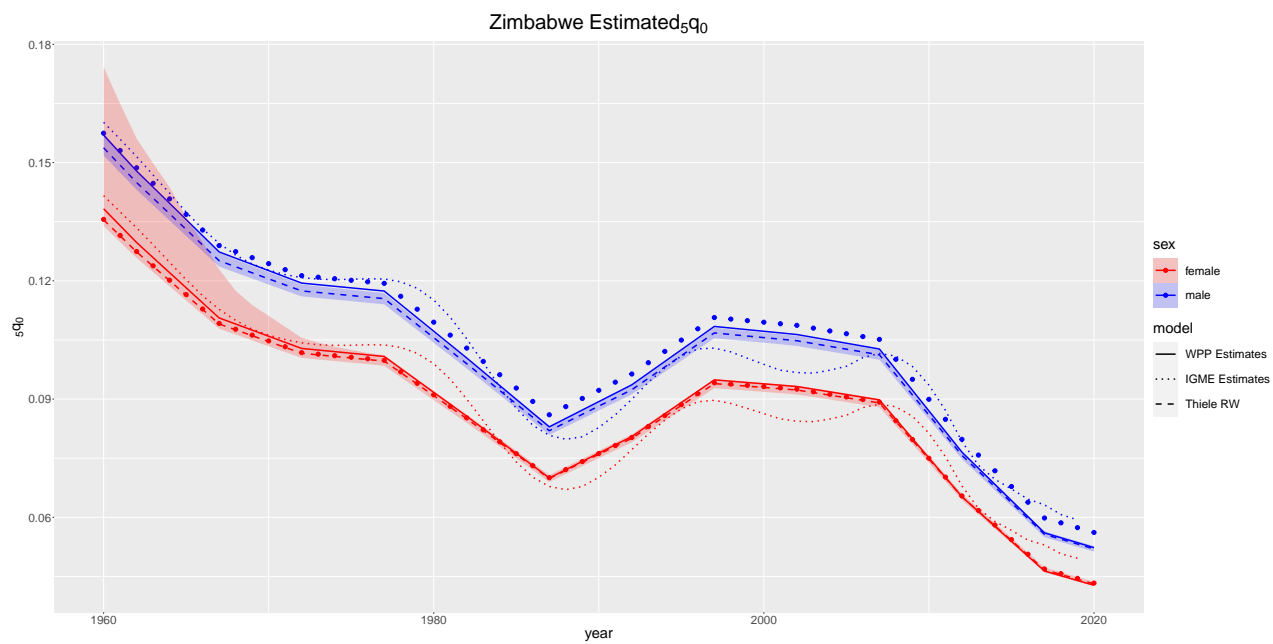


Figure 4: Estimated ${}_5q_0$

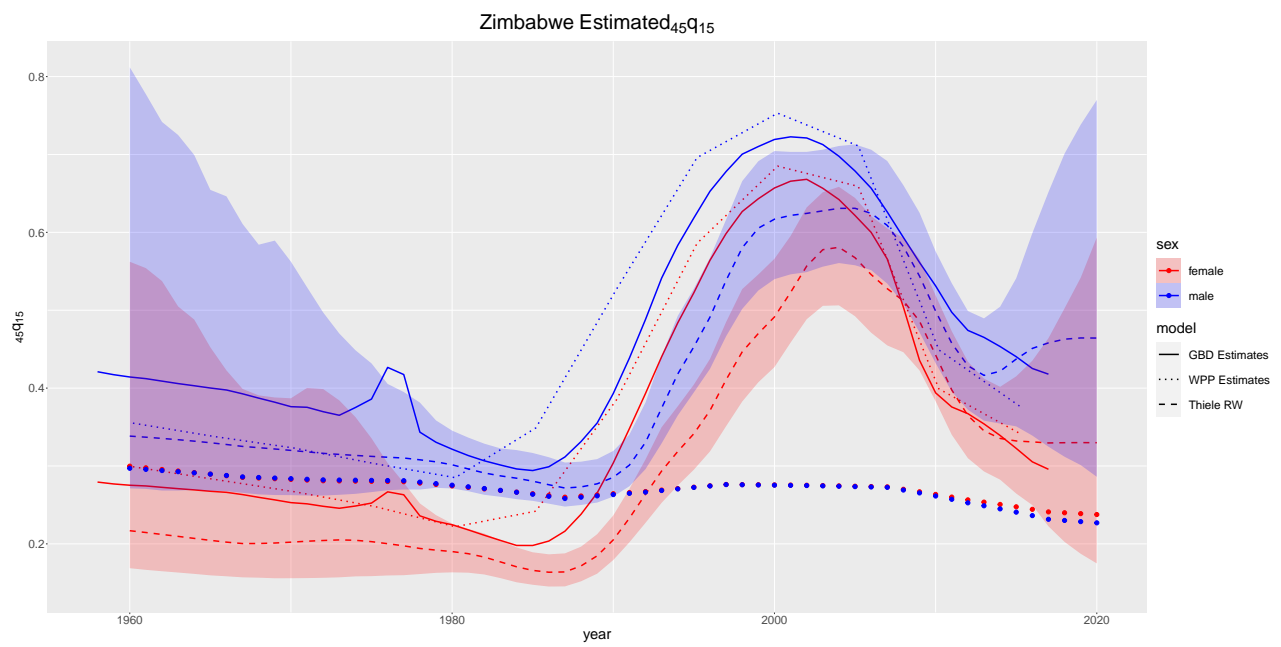


Figure 5: Estimated $_{45}q_{15}$

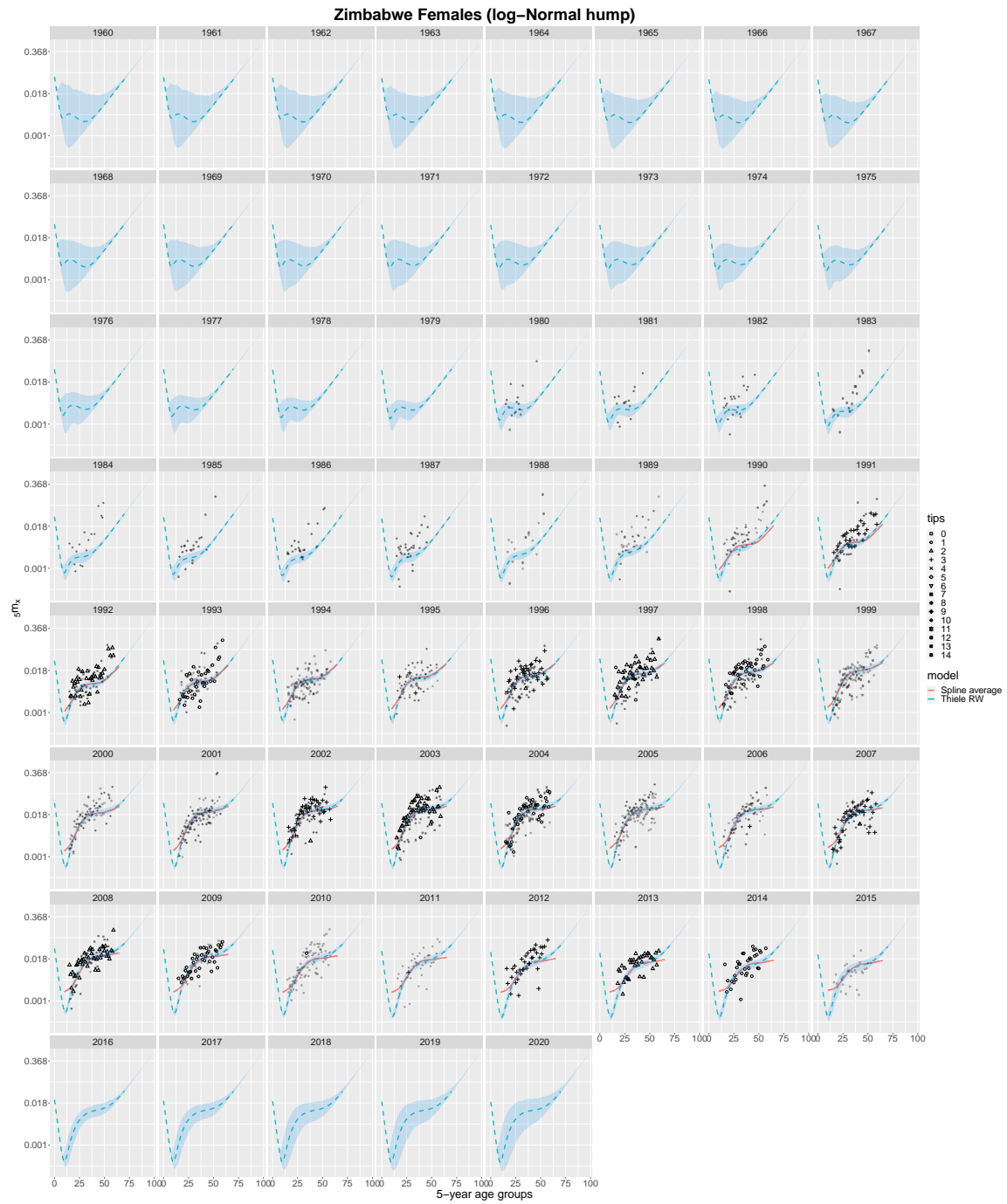


Figure 6: Mortality Schedules

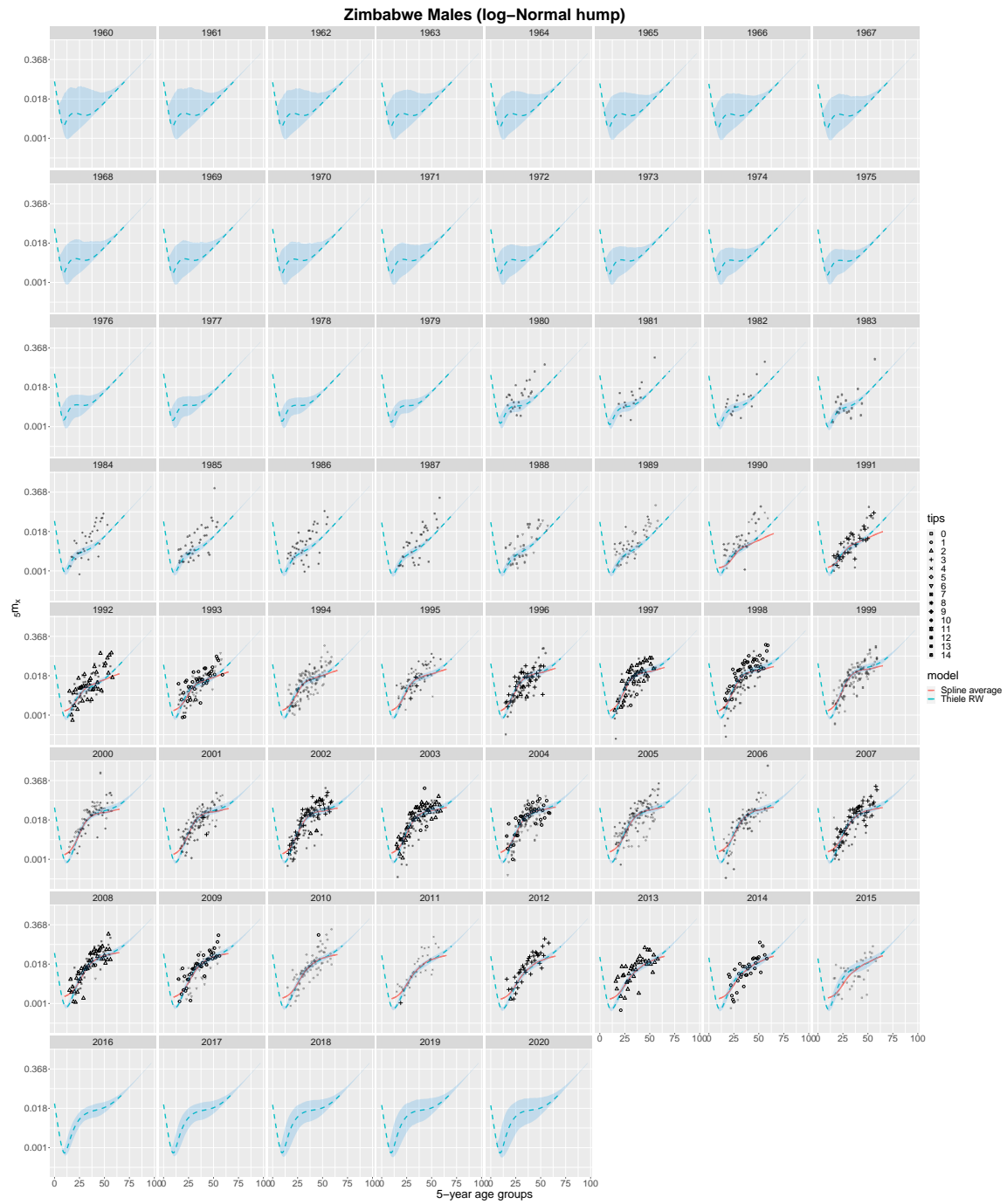


Figure 7: Mortality Schedules

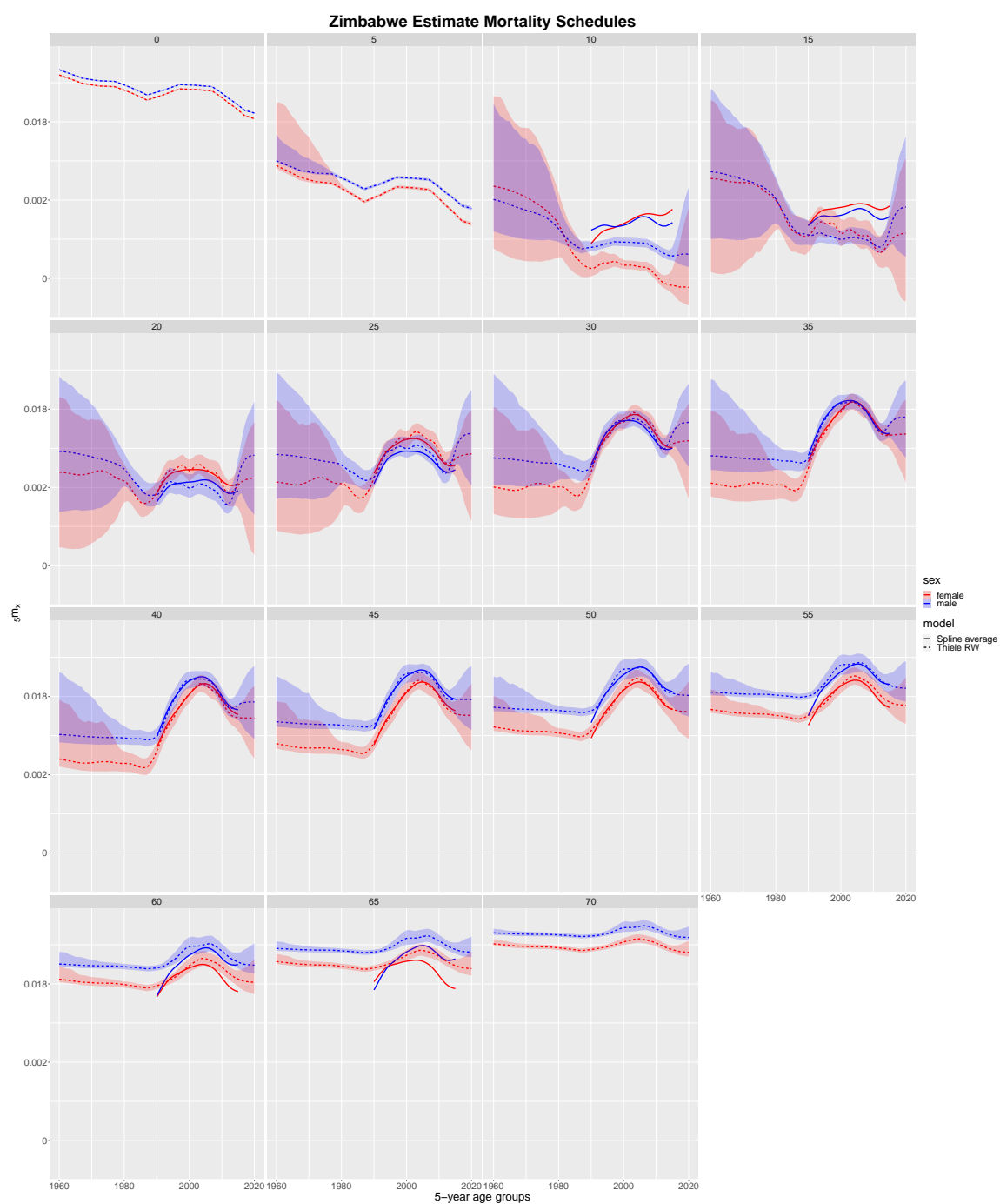


Figure 8: Mortality Schedules

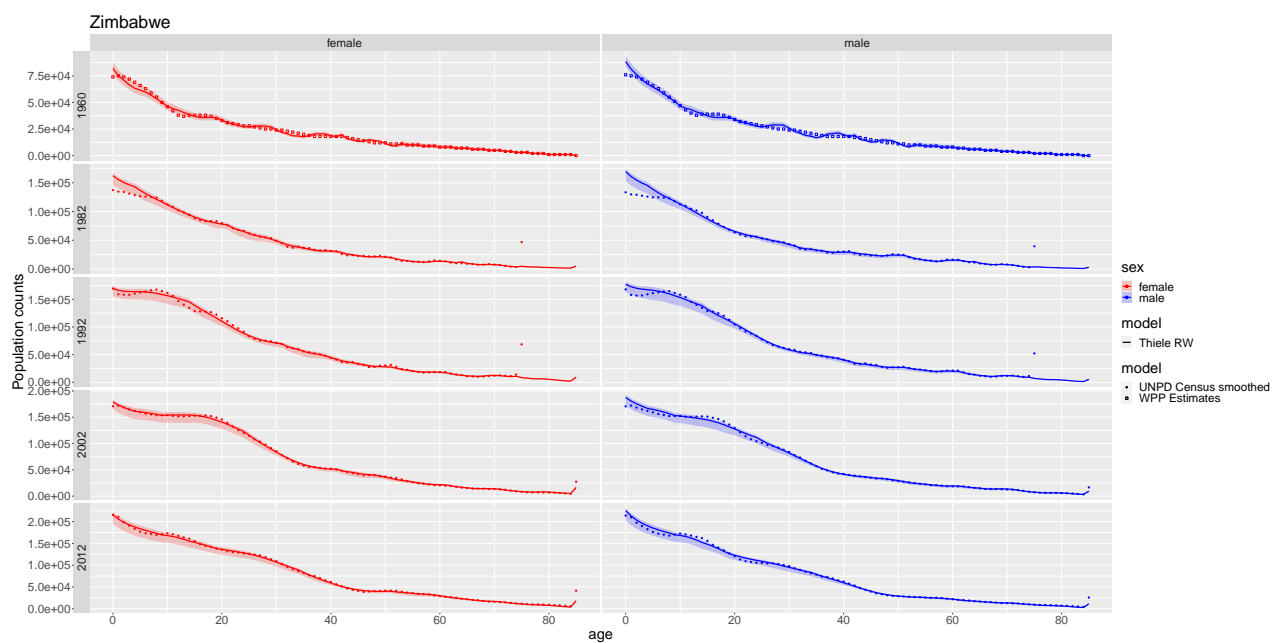


Figure 9: Population

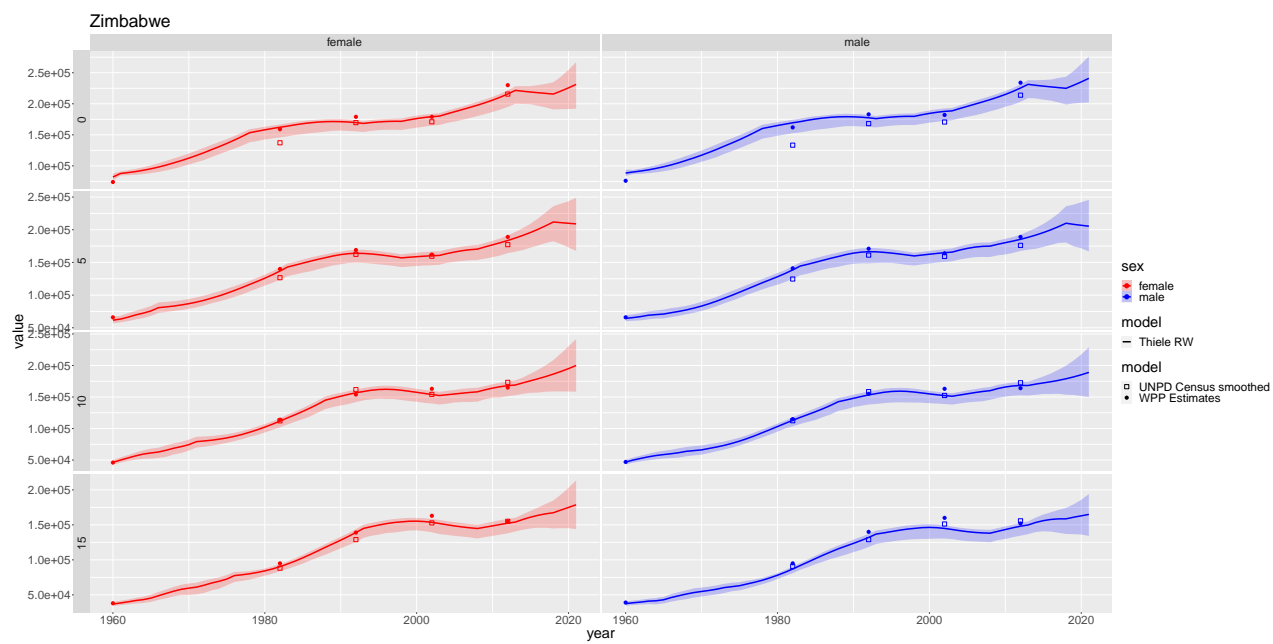


Figure 10: Population

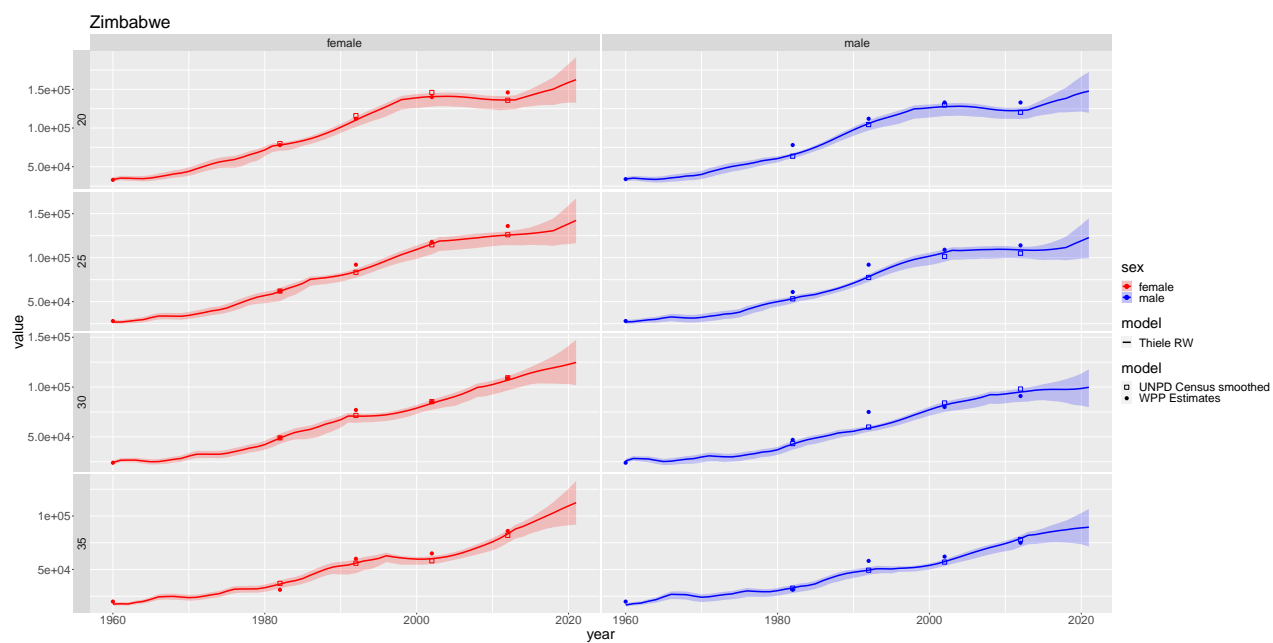


Figure 11: Population

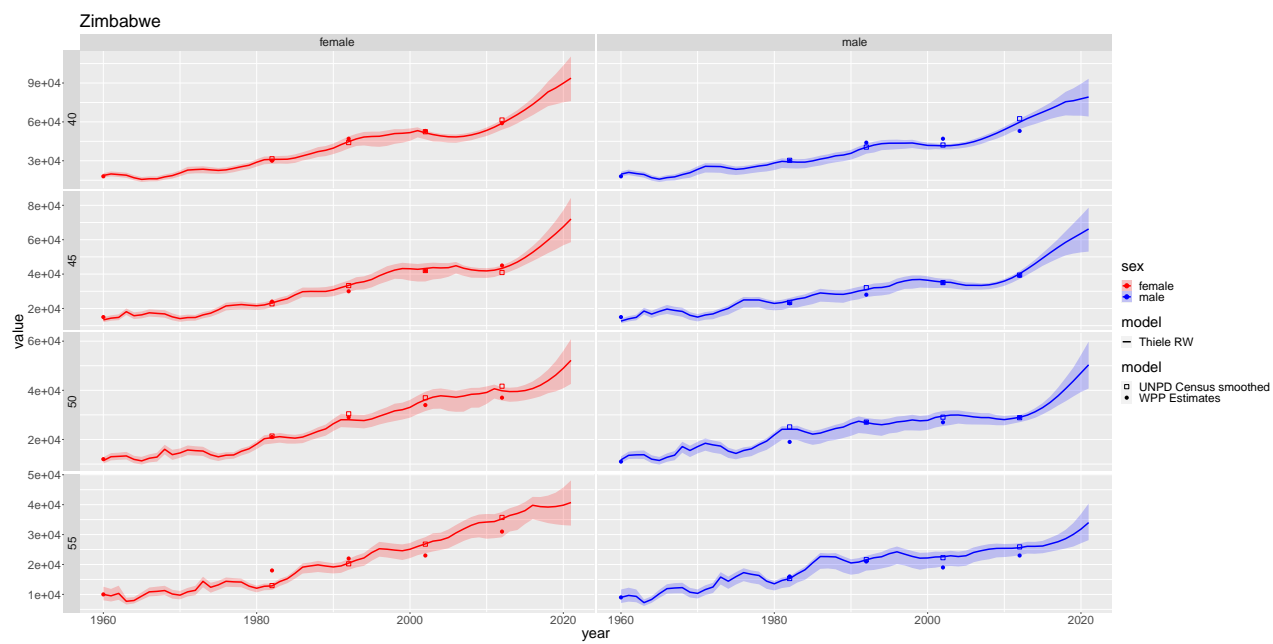


Figure 12: Population

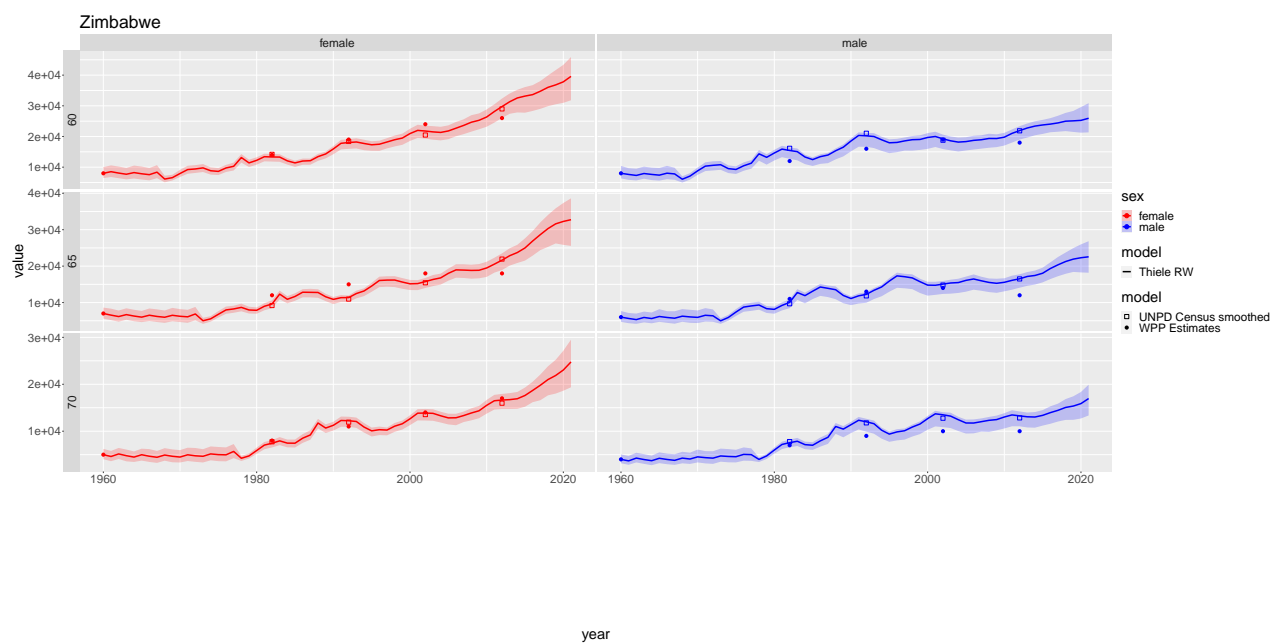


Figure 13: Population

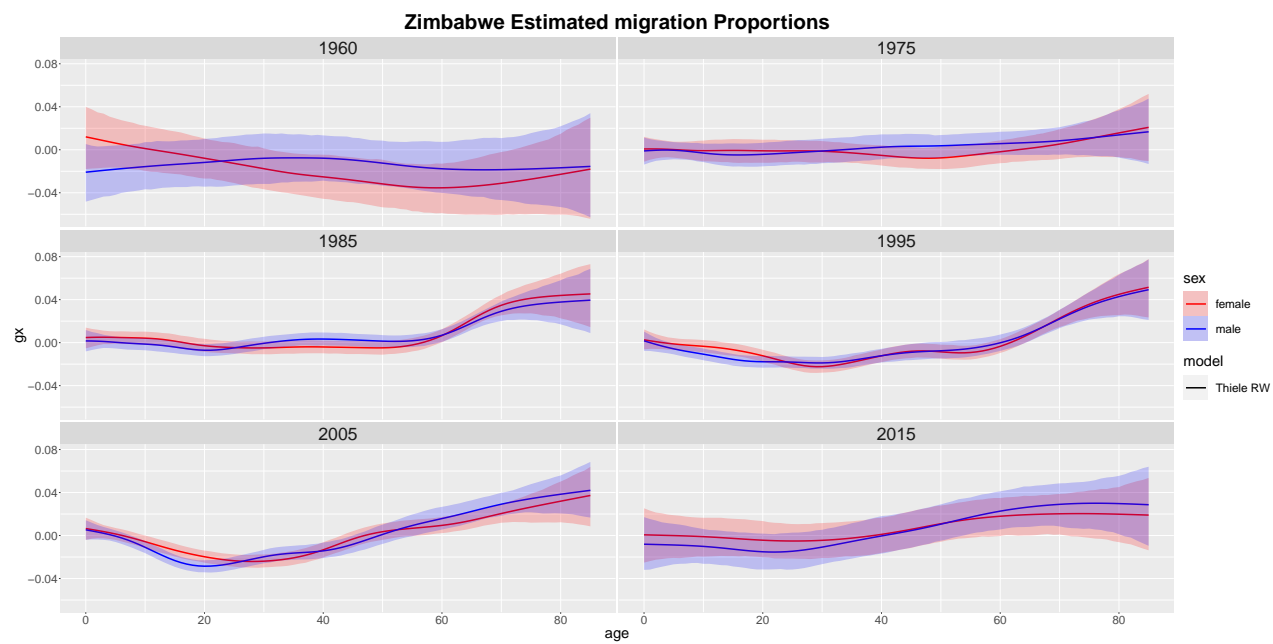


Figure 14: Migration

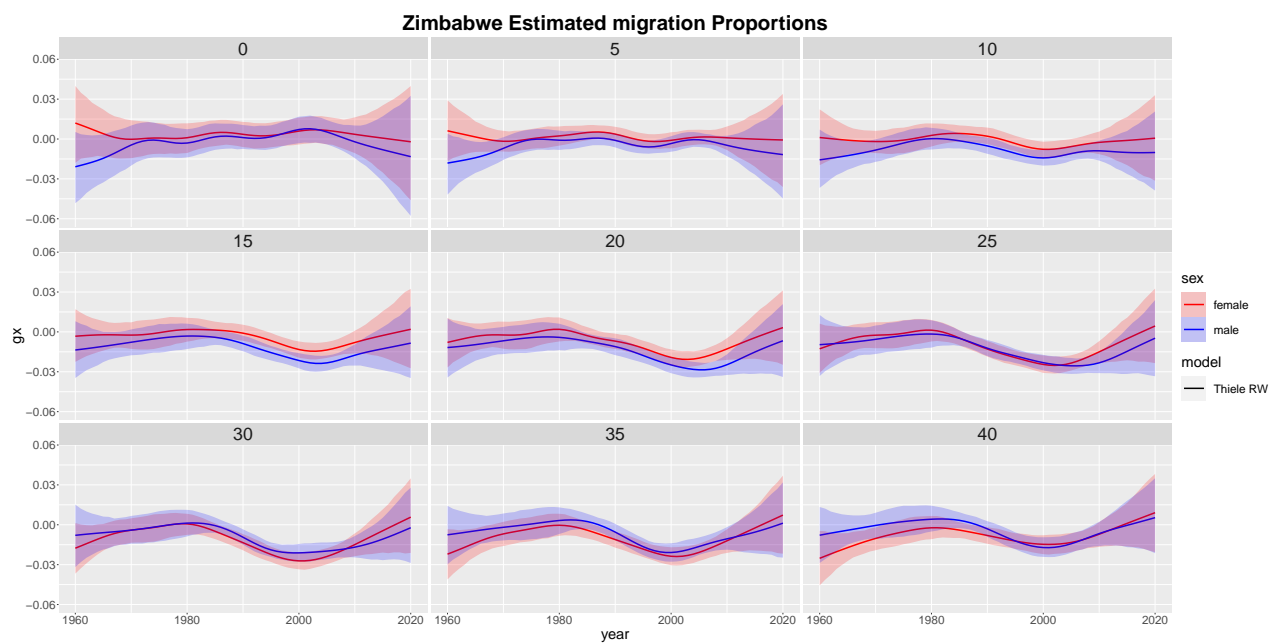


Figure 15: Migration

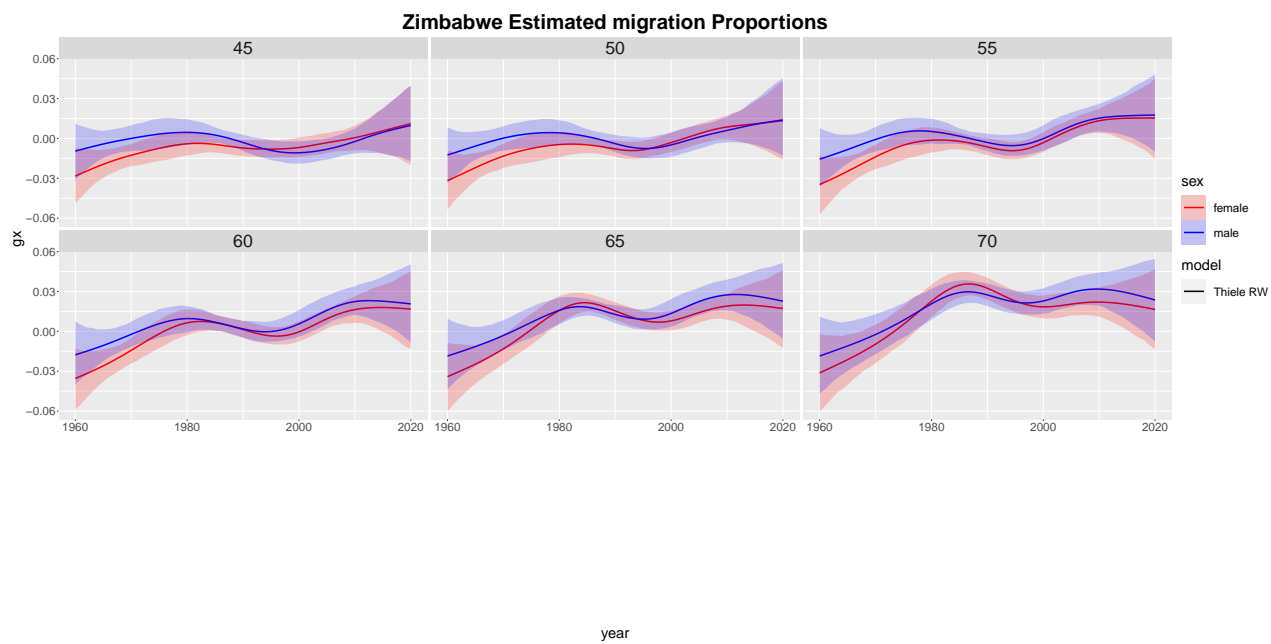


Figure 16: Migration

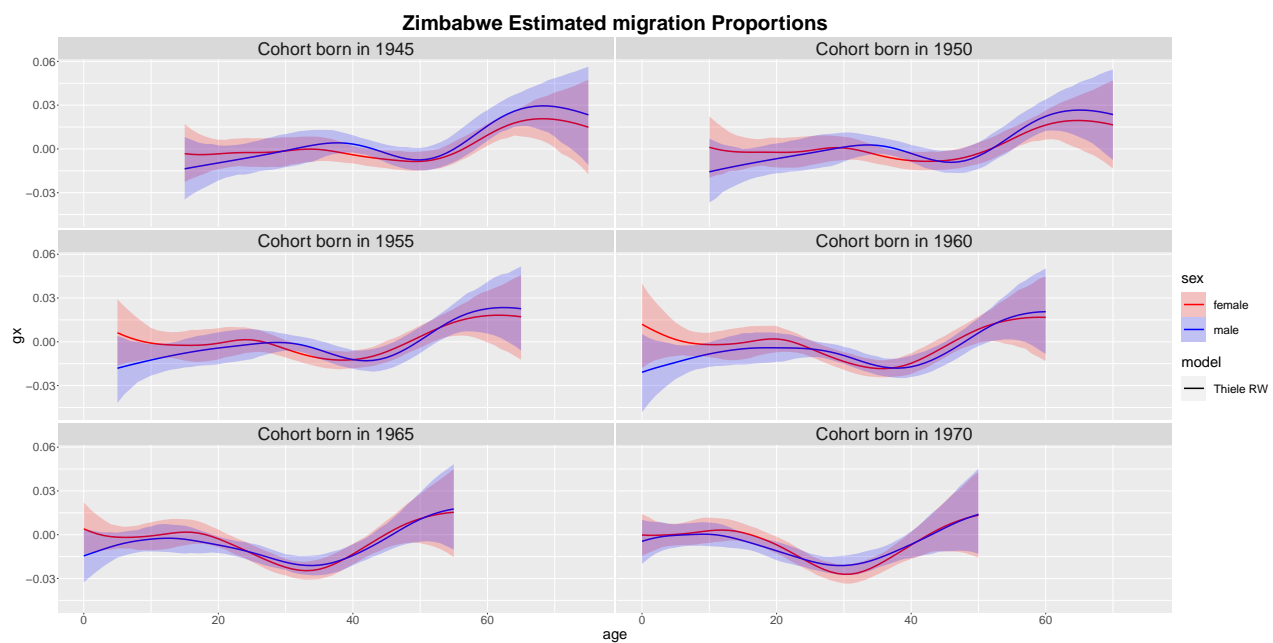


Figure 17: Migration

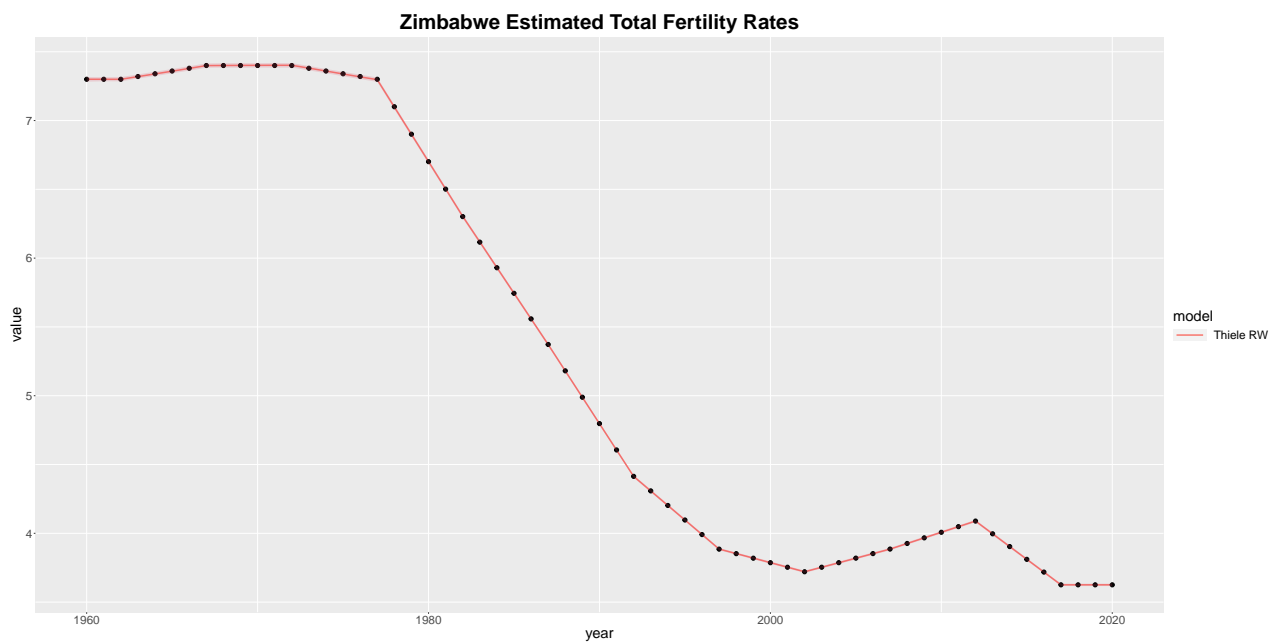


Figure 18: Total Fertility

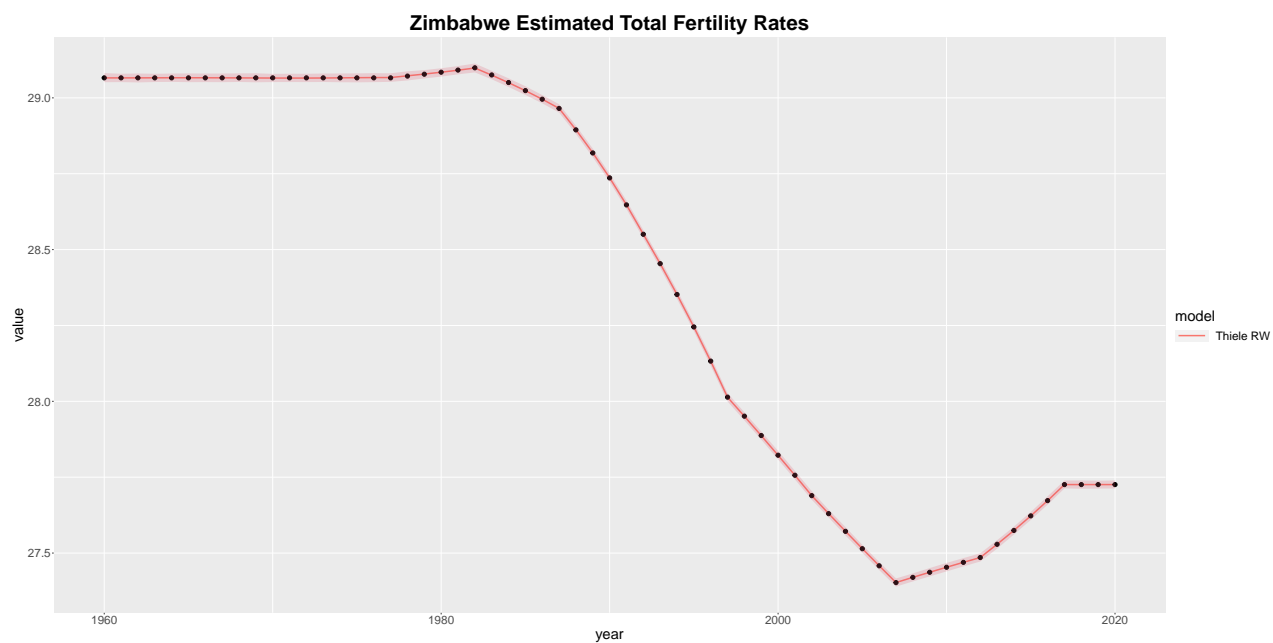


Figure 19: Mean age at births

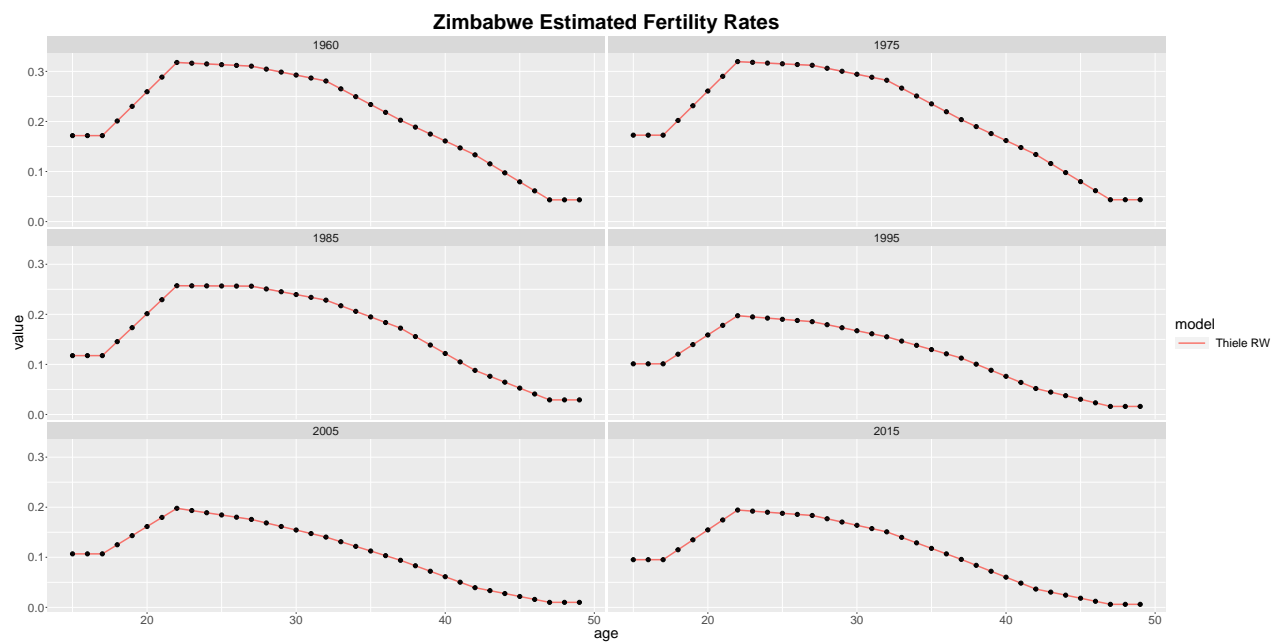


Figure 20: Fertility

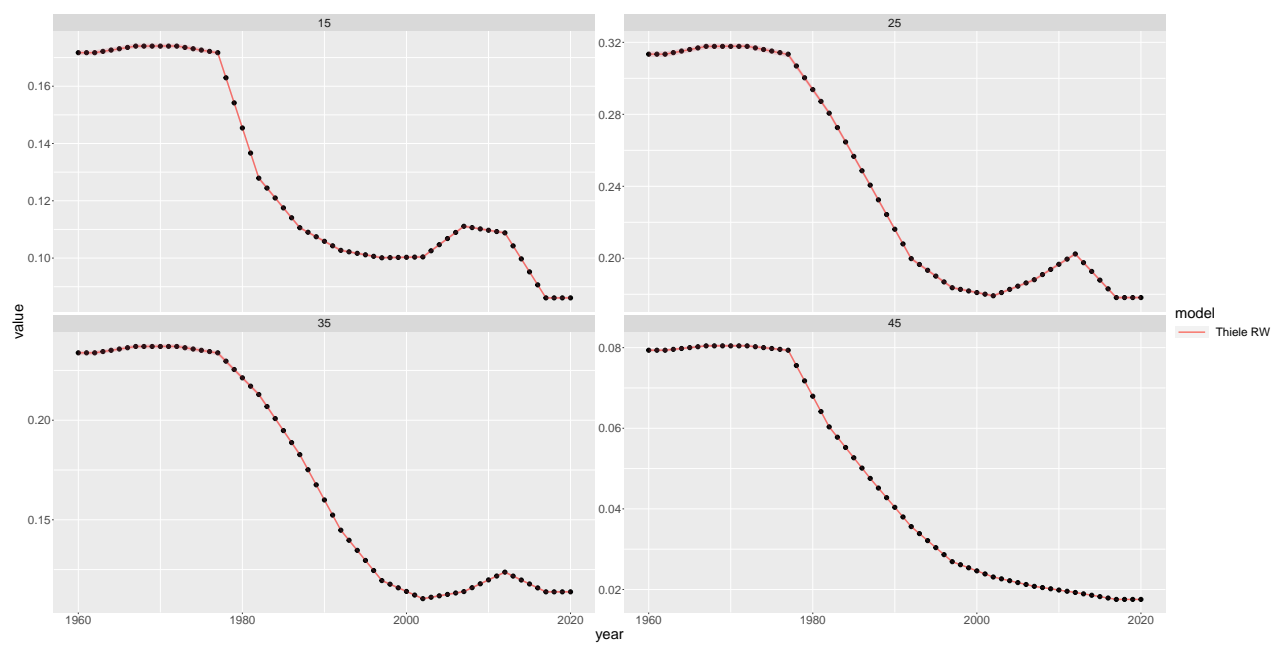


Figure 21: Fertility