

Malawi

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

## # A tibble: 86 x 5
##   age `1987` `1998` `2008` `2018`
##   <dbl> <dbl> <dbl> <dbl> <dbl>
## 1 0 150512. 185817 255576 263837
## 2 1 130056. 161798. 237534. 255733
## 3 2 137591. 163355. 237811. 255945
## 4 3 142055. 163996. 231596. 260083.
## 5 4 146577. 160454. 224314. 261987.
## 6 5 146247. 158092. 220173. 264751.
## 7 6 140033. 154088. 212261. 266295.
## 8 7 132367. 147606. 201612. 267062.
## 9 8 126294. 139309 192051. 266622.
## 10 9 117420. 133715. 185614. 263807.
## # ... with 76 more rows

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

## # A tibble: 18 x 3
##   age `1966` `1977`
##   <dbl> <dbl> <dbl>
## 1 0 382092 552376.
## 2 5 301988 416036.
## 3 10 250885. 313031.
## 4 15 209466 273147.
## 5 20 183540. 255764.
## 6 25 164044. 220751.
## 7 30 142858 175355.
## 8 35 121689. 140220.
## 9 40 102922 119257.
## 10 45 83121. 104342.
## 11 50 66045 85701.
## 12 55 49106 67465.
## 13 60 33155 54358.
## 14 65 79545 40983.
## 15 70 NA 28902.
## 16 75 NA 20259.
## 17 80 NA 13773.
## 18 85 NA 24390.

## [1] "Census Males"

## # A tibble: 86 x 5
##   age `1987` `1998` `2008` `2018`
##   <dbl> <dbl> <dbl> <dbl> <dbl>
## 1 0 147339. 182508 247809 258965
## 2 1 127821. 160517 232052. 252346.
## 3 2 134432. 160929 232018. 252047.
## 4 3 138672. 161853. 226052. 255496.
## 5 4 143023. 158123. 219009. 256999.
## 6 5 142844. 155530. 214853. 259155.
```

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## 7      6 137182. 151564. 207116. 259989.
## 8      7 129233. 145452  196810. 259862.
## 9      8 123508. 137236. 187436. 258800.
## 10     9 115626. 131935. 181245. 255940.
## # ... with 76 more rows
```

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

```
## # A tibble: 18 x 3
##   age `1966` `1977`
##   <dbl> <dbl> <dbl>
## 1     0 366133 529521.
## 2     5 295618 410674.
## 3    10 238983. 314866.
## 4    15 189232 253035.
## 5    20 153666. 213954.
## 6    25 128427. 187227.
## 7    30 109493. 156681.
## 8    35  95656. 125964.
## 9    40  84395 106763.
## 10   45  71344.  92944.
## 11   50  59436.  75529.
## 12   55  47722  61111.
## 13   60  33228  50887.
## 14   65  81935  39100.
## 15   70      NA  28168.
## 16   75      NA  19497.
## 17   80      NA  11498.
## 18   85      NA  23975.
```

Thiele log-Normal Hump Spline

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

##	log_tau2_logpop	log_tau2_logpop	log_tau2_logpop	log_tau2_logpop	log
##	4.71064958	6.14579147	4.53714213	5.87869741	
##	log_dispersion	log_dispersion	log_lambda_tp	tp_slope	
##	0.98568581	1.20994988	3.31426890	-0.01650436	
##	log_lambda_phi	log_lambda_psi	log_lambda_A	log_lambda_B	log_la
##	11.38166676	5.62971403	11.22817861	8.14906869	
##	log_lambda_epsilon				
##	5.64553871				

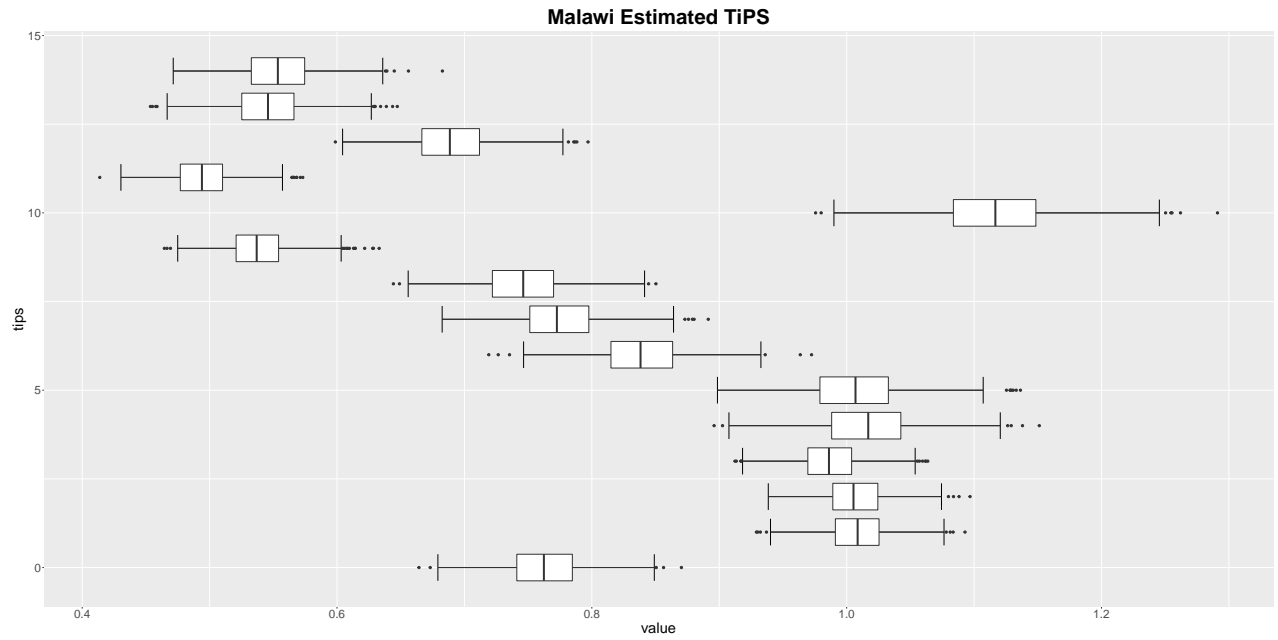


Figure 1: Estimated TiPS

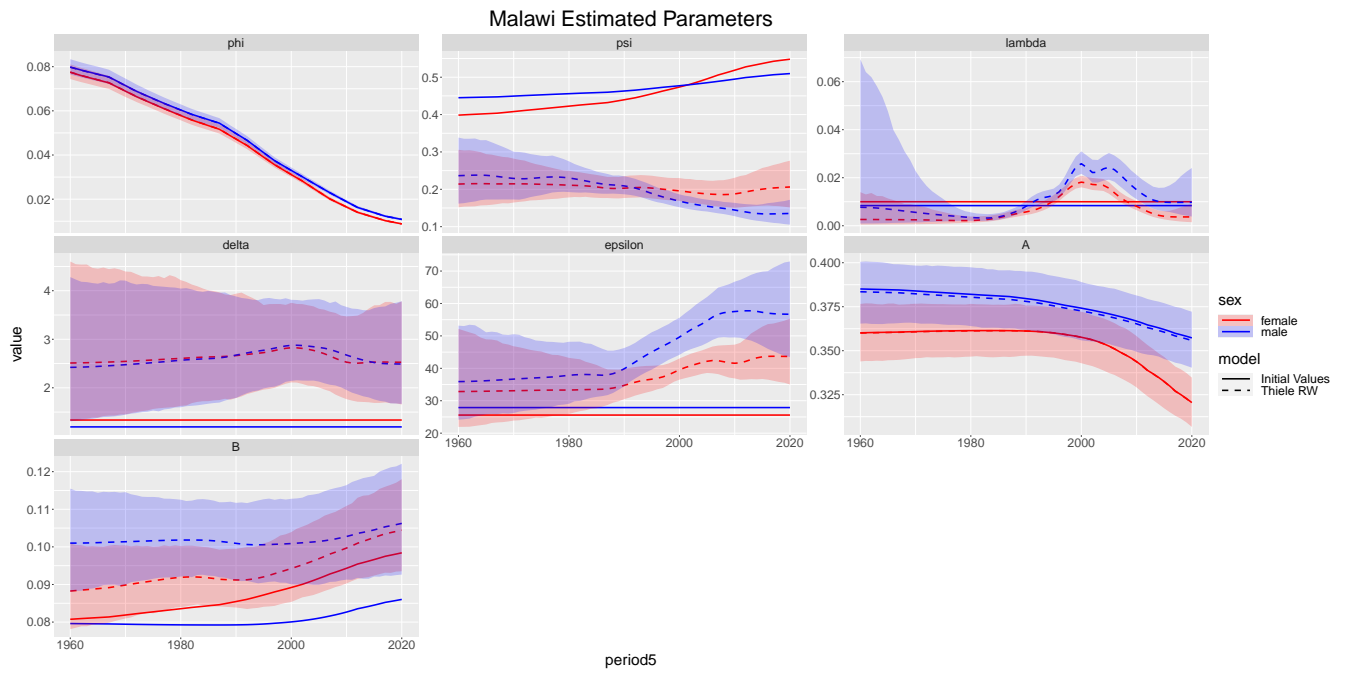


Figure 2: Estimated parameters

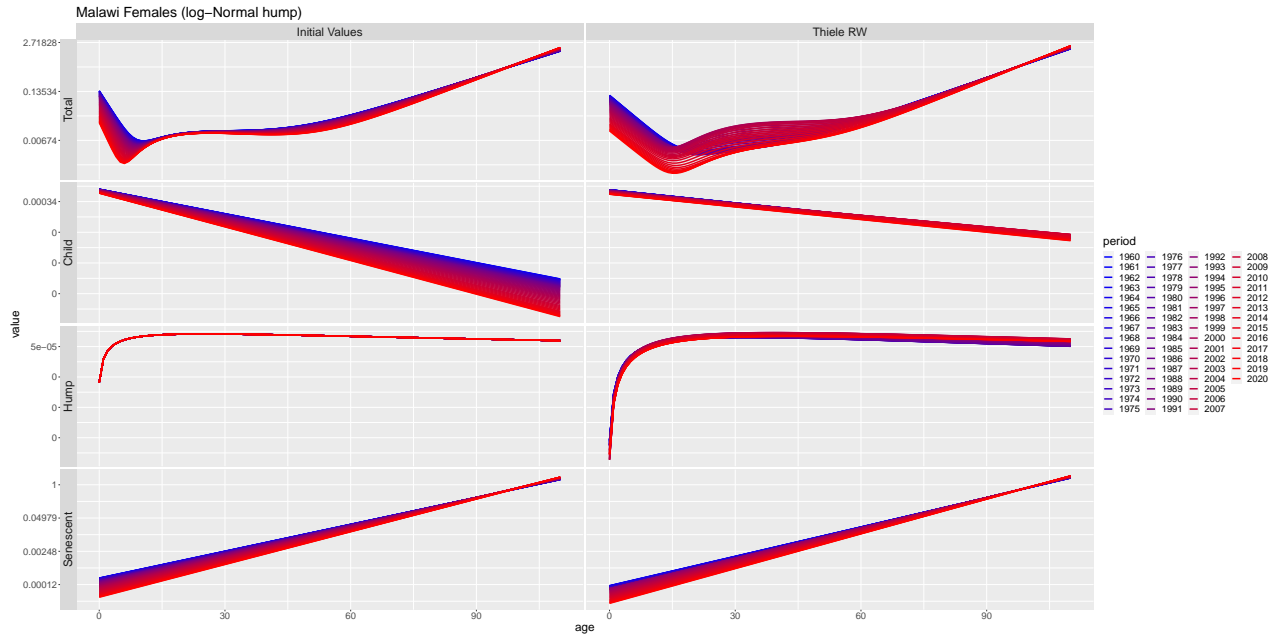


Figure 3: Thiele Decomposed

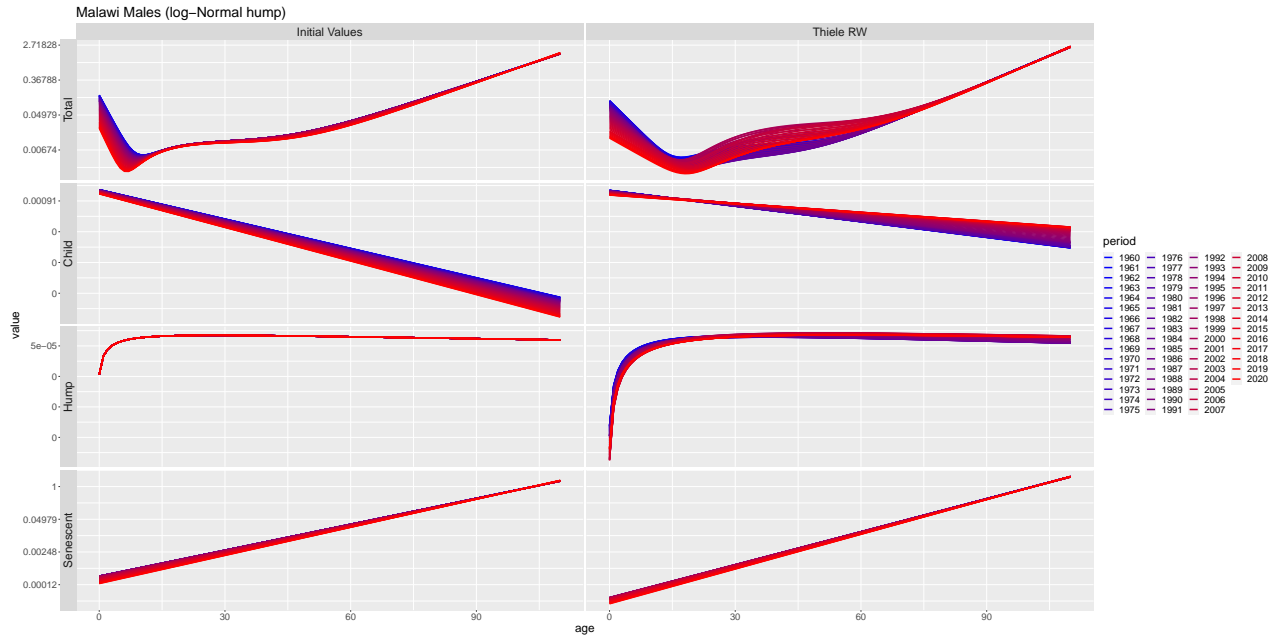


Figure 4: Thiele Decomposed

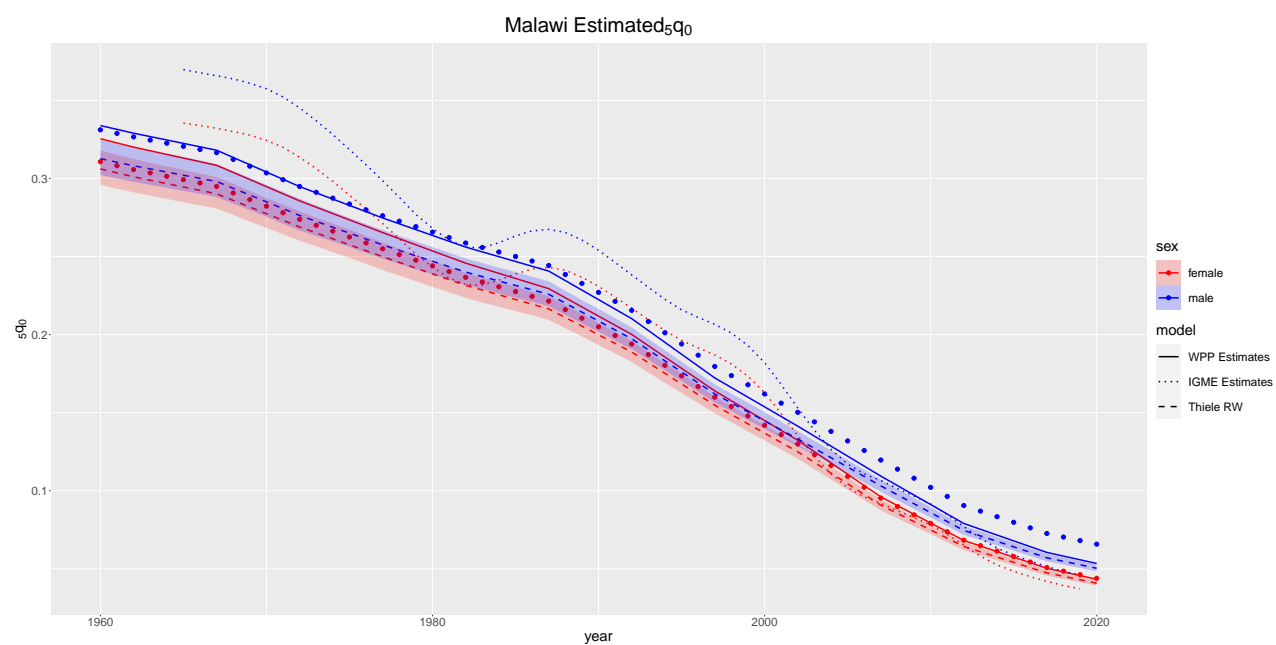


Figure 5: Estimated ${}_5q_0$

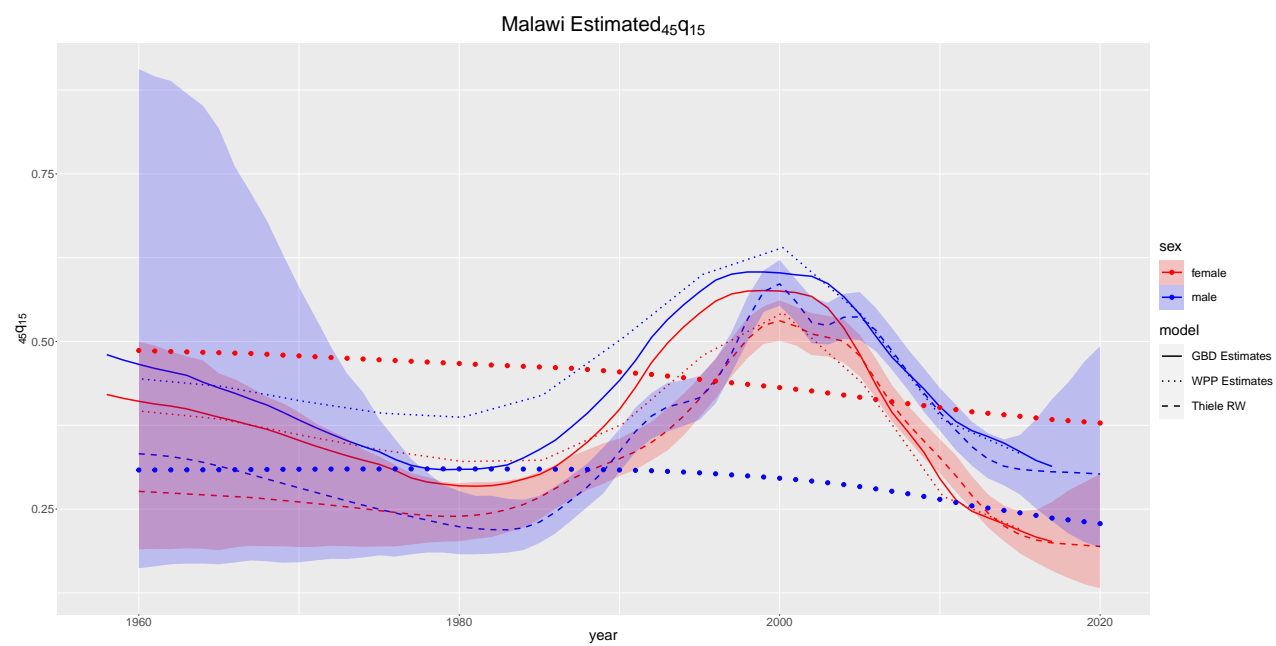


Figure 6: Estimated ${}_{45}q_{15}$

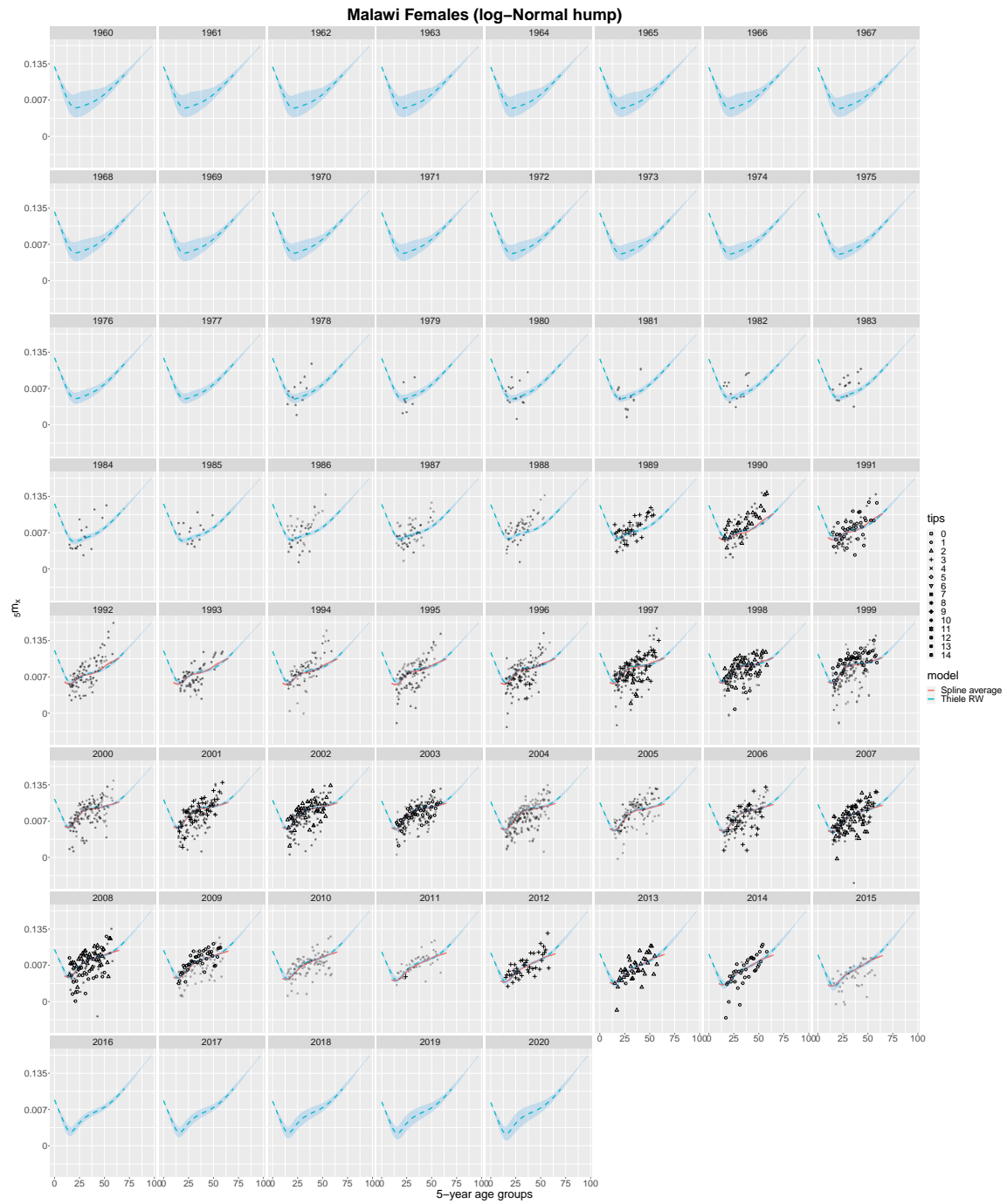


Figure 7: Mortality Schedules

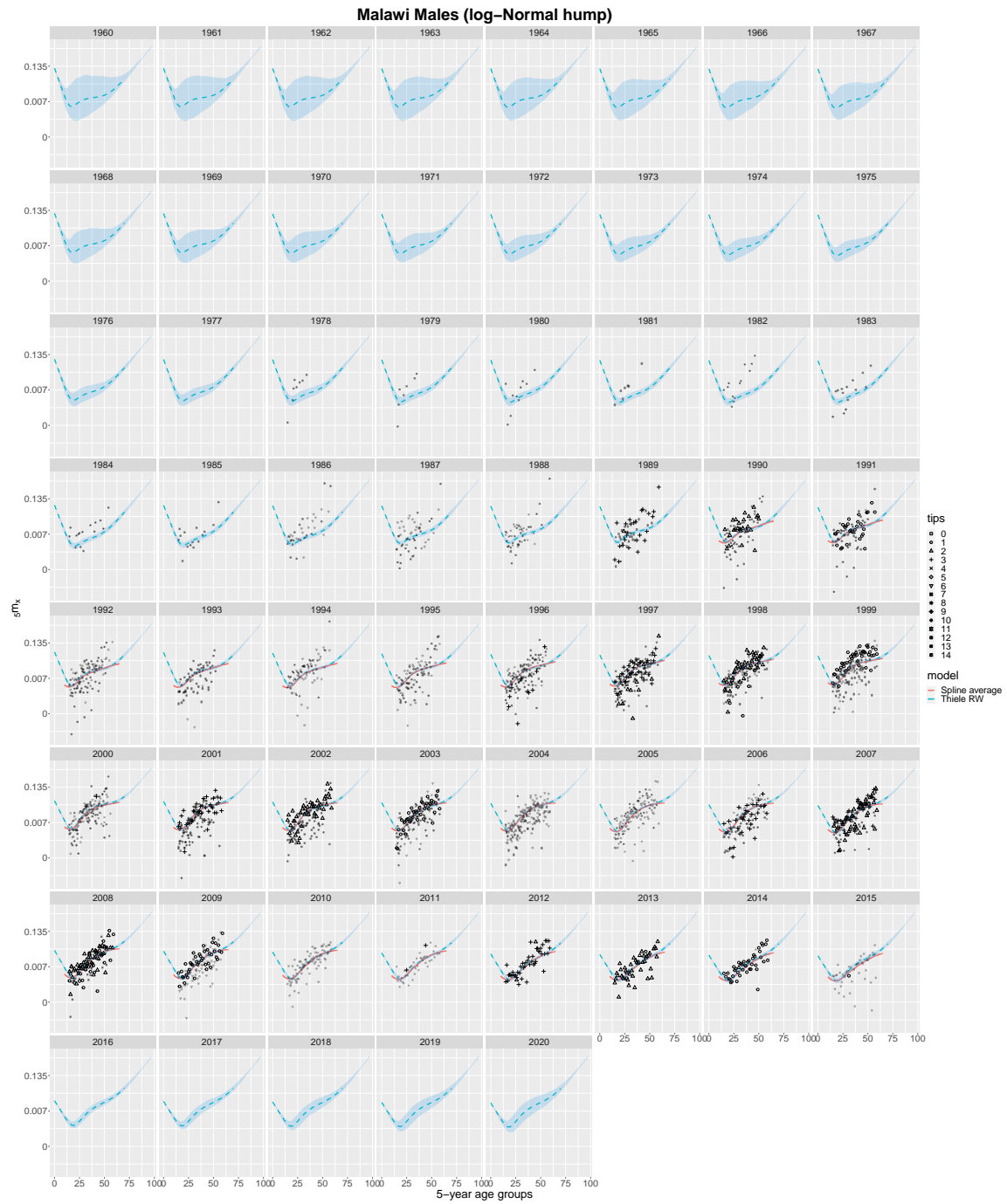


Figure 8: Mortality Schedules

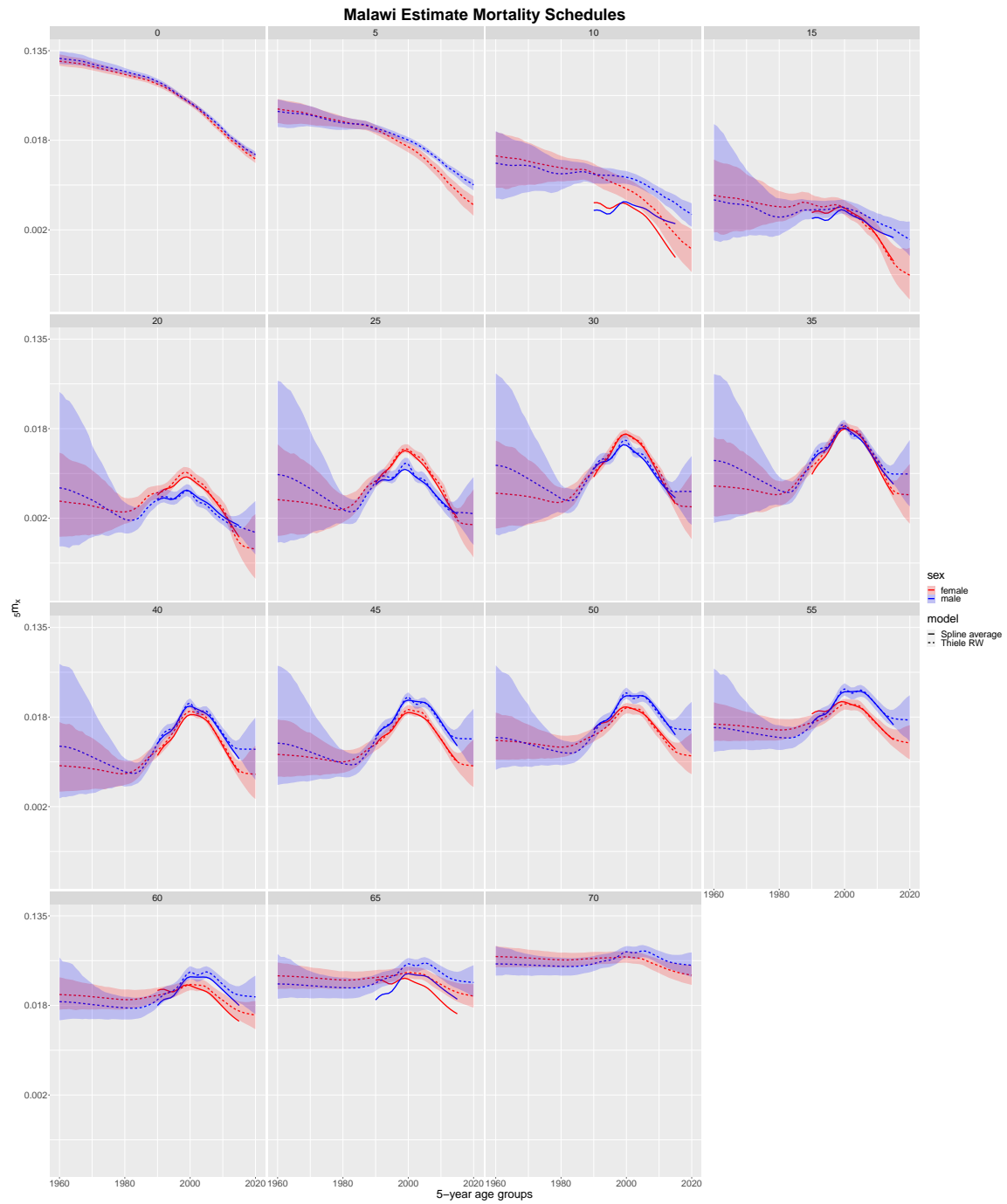


Figure 9: Mortality Schedules

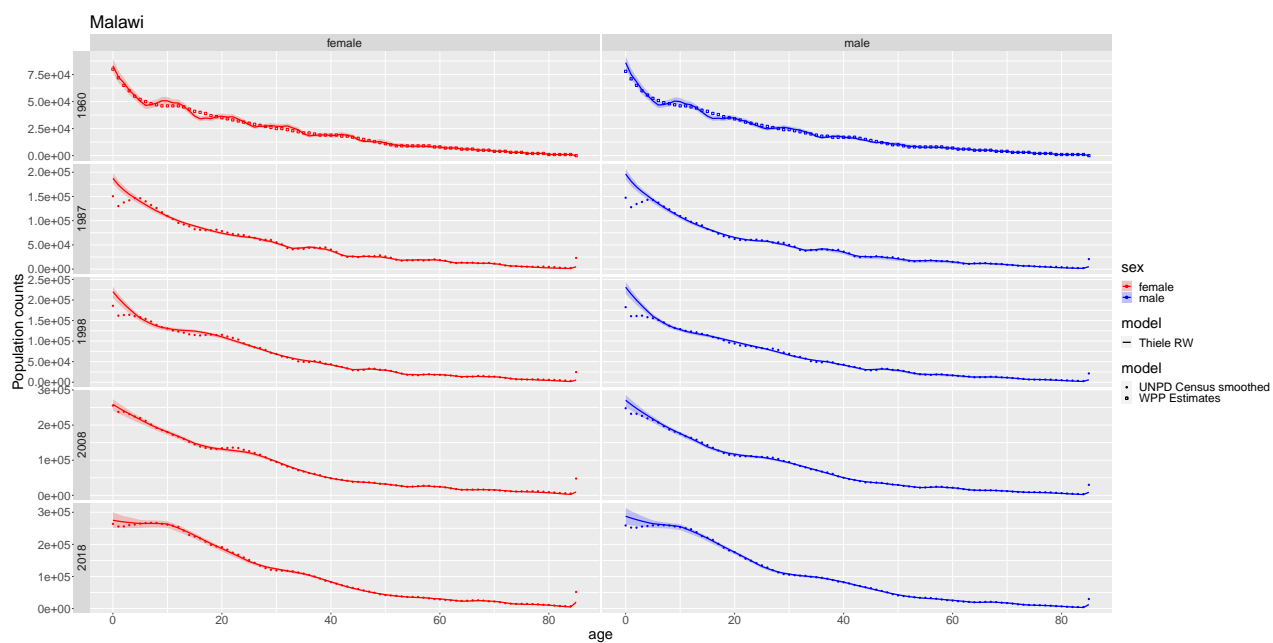


Figure 10: Population

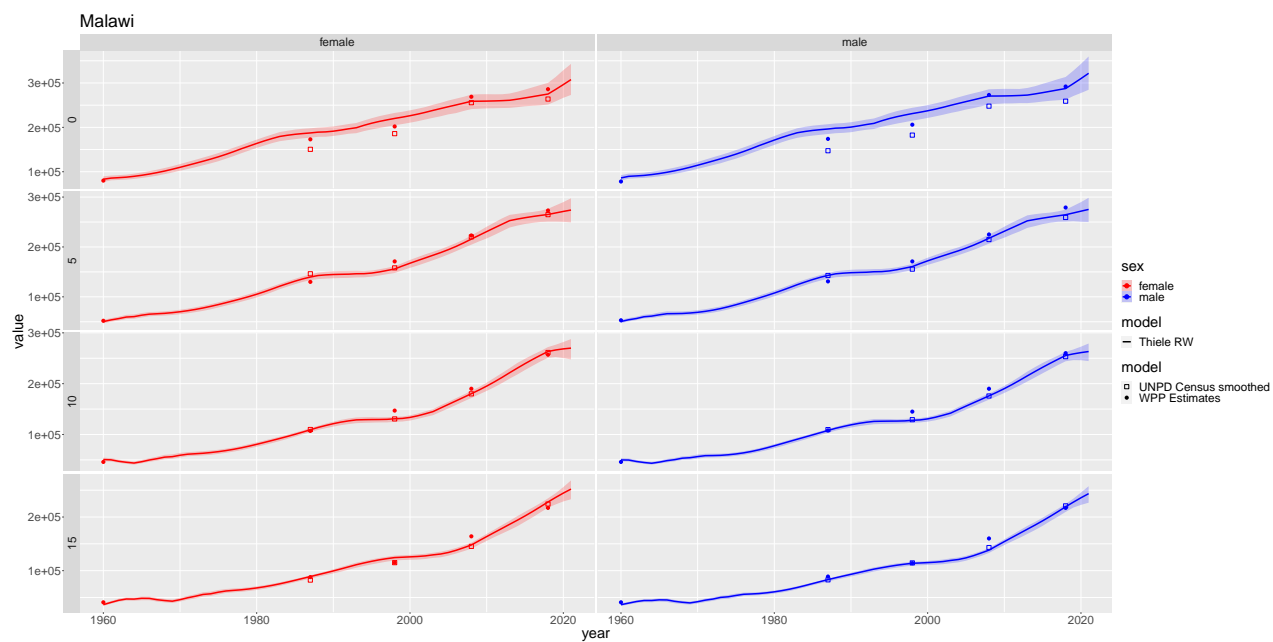


Figure 11: Population

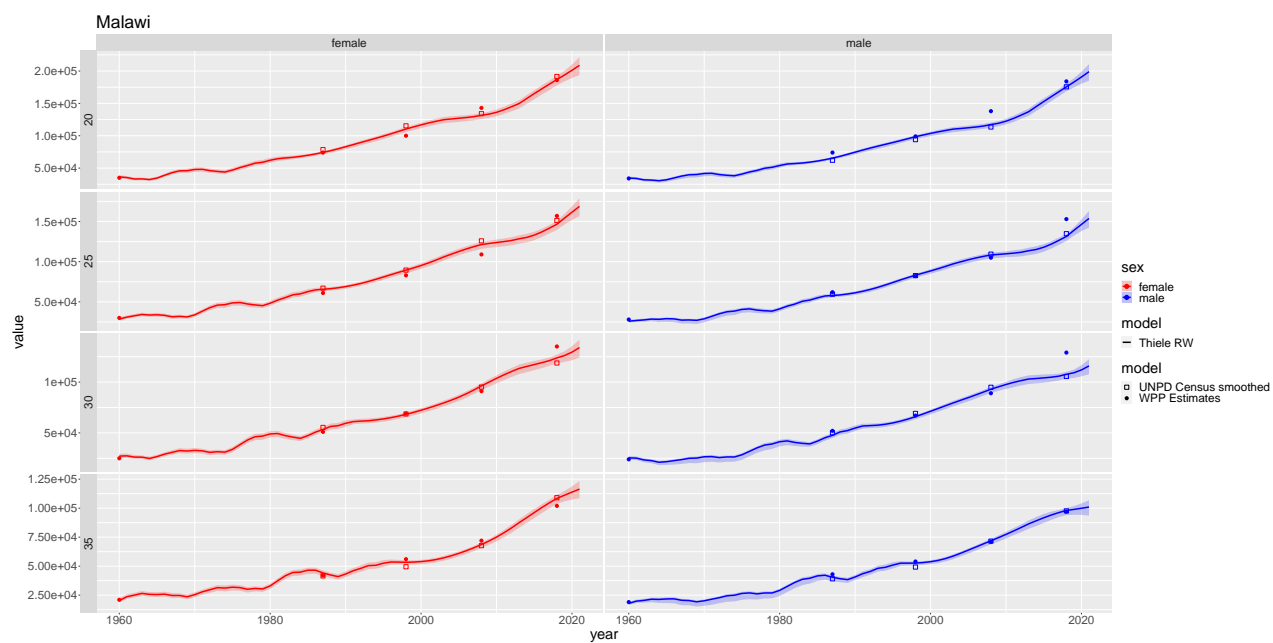


Figure 12: Population

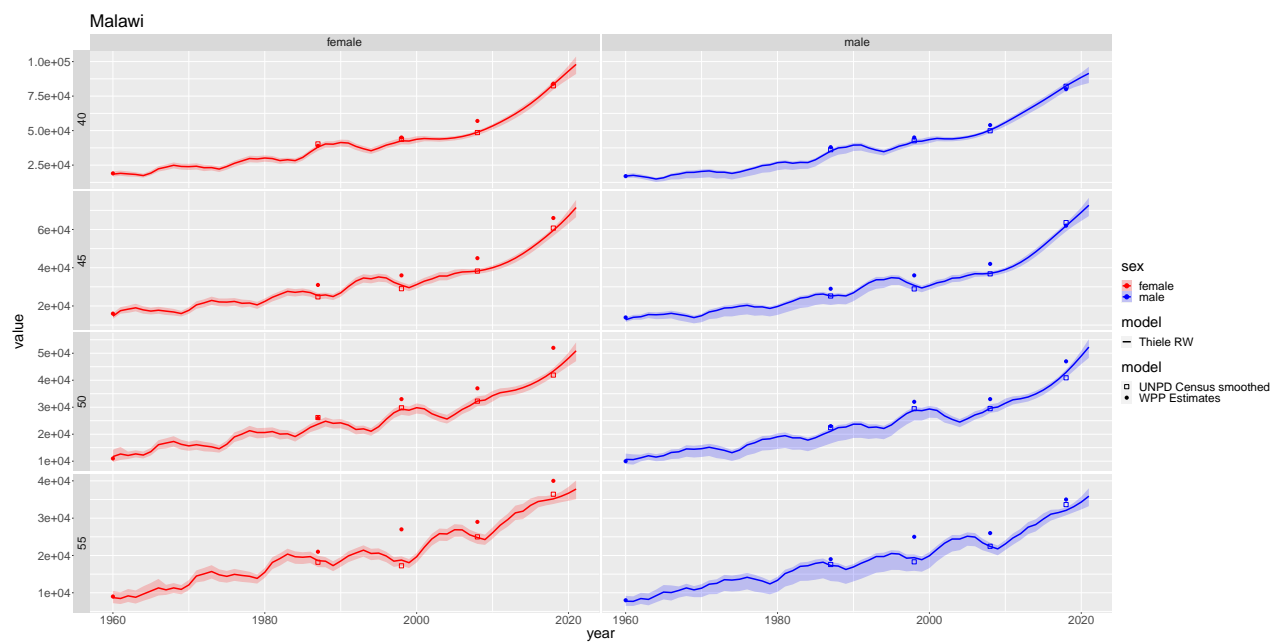


Figure 13: Population

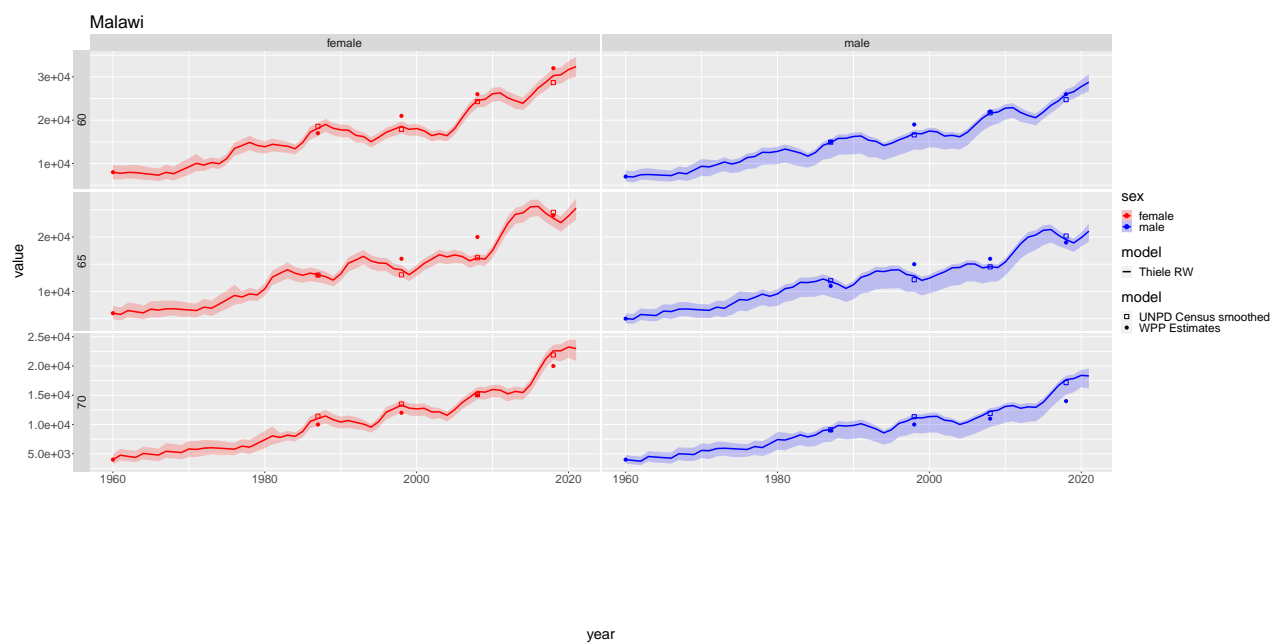


Figure 14: Population

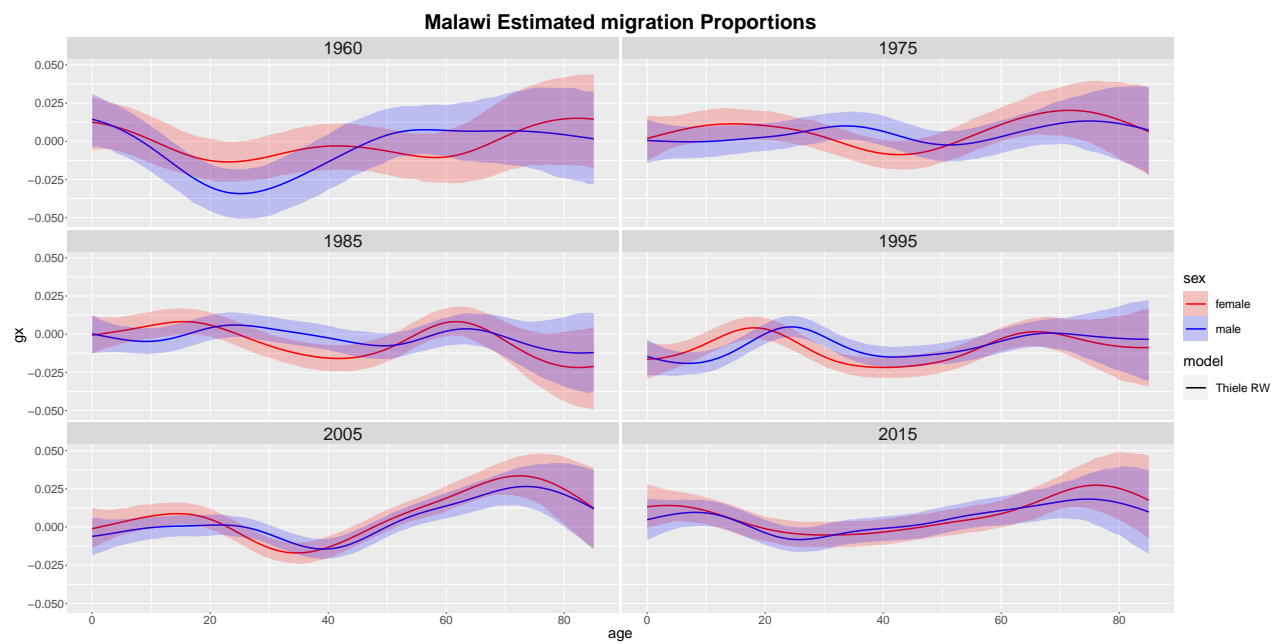


Figure 15: Migration

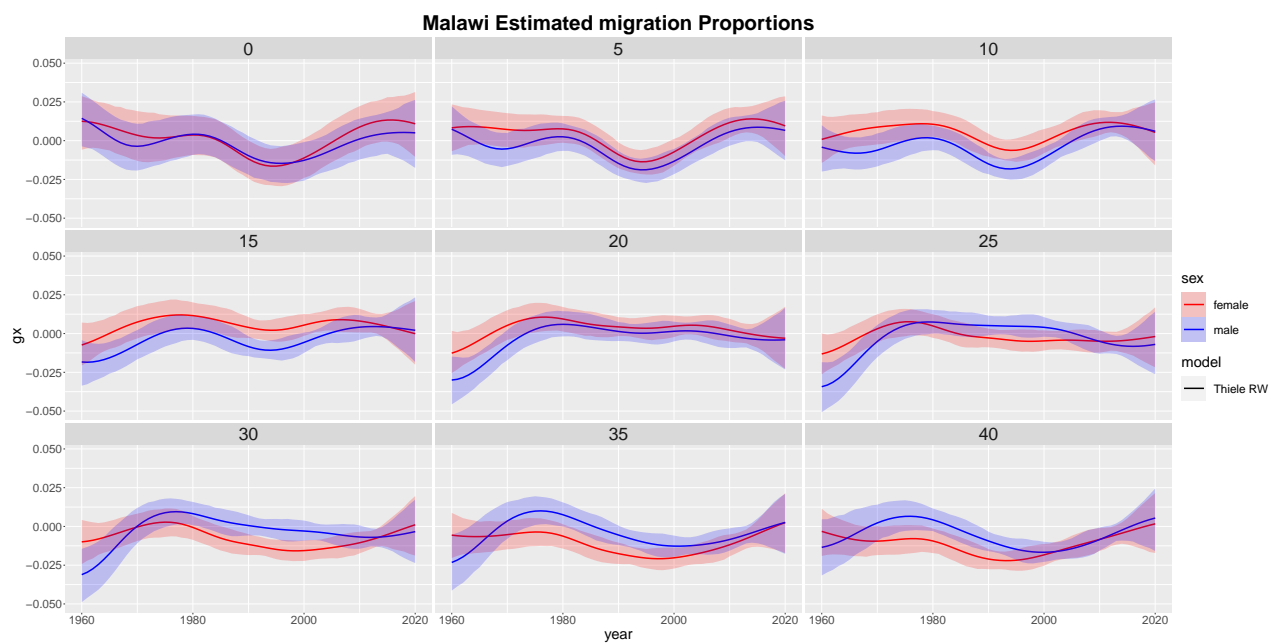


Figure 16: Migration

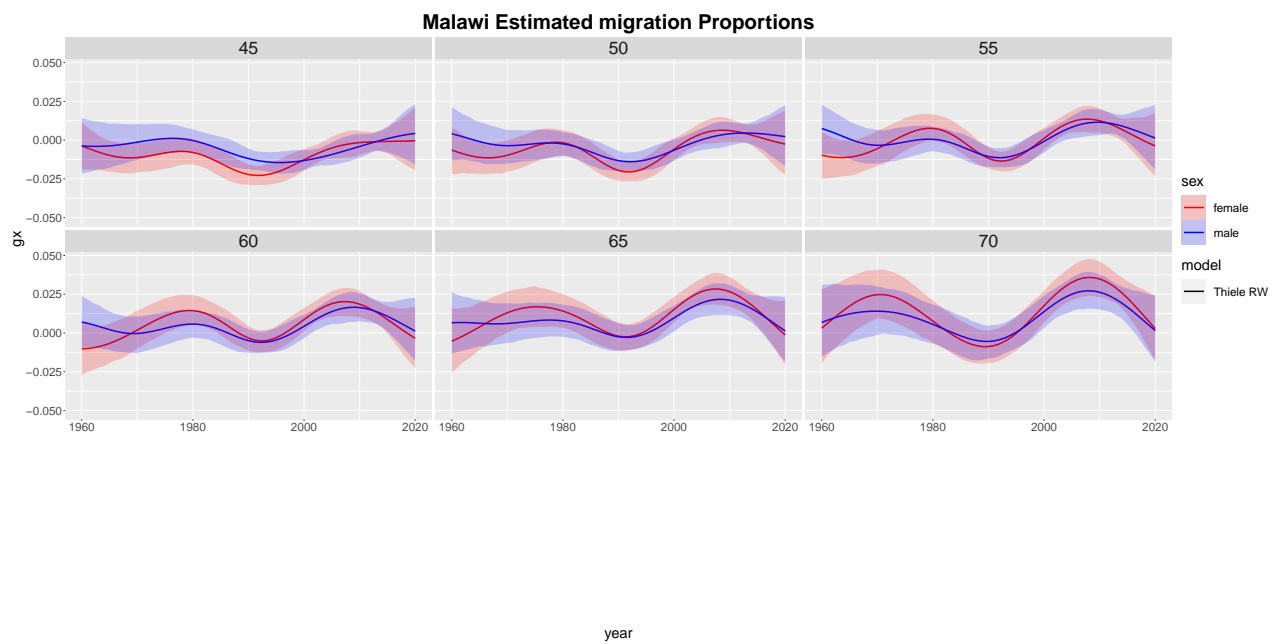


Figure 17: Migration

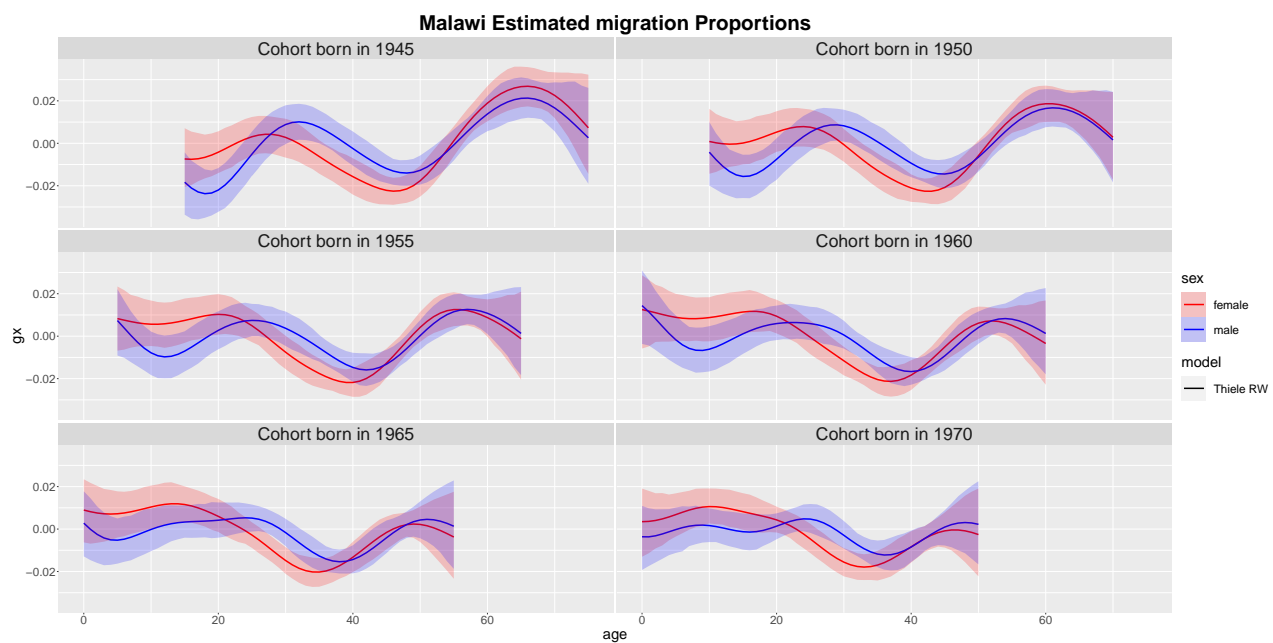


Figure 18: Migration

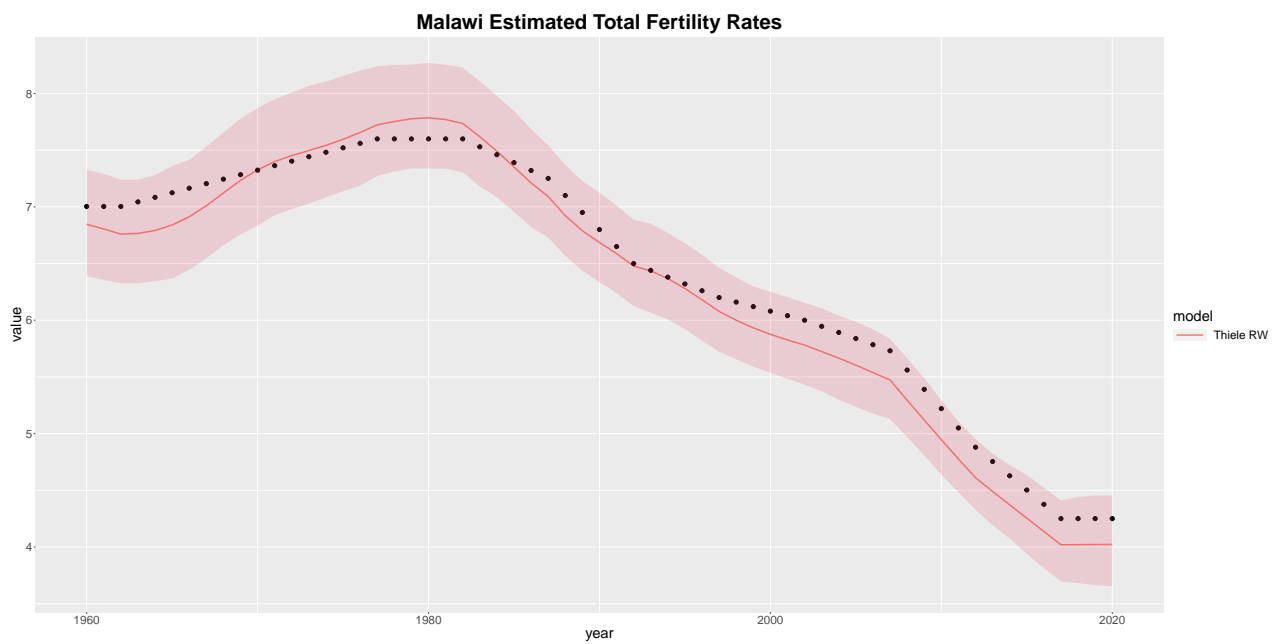


Figure 19: Total Fertility

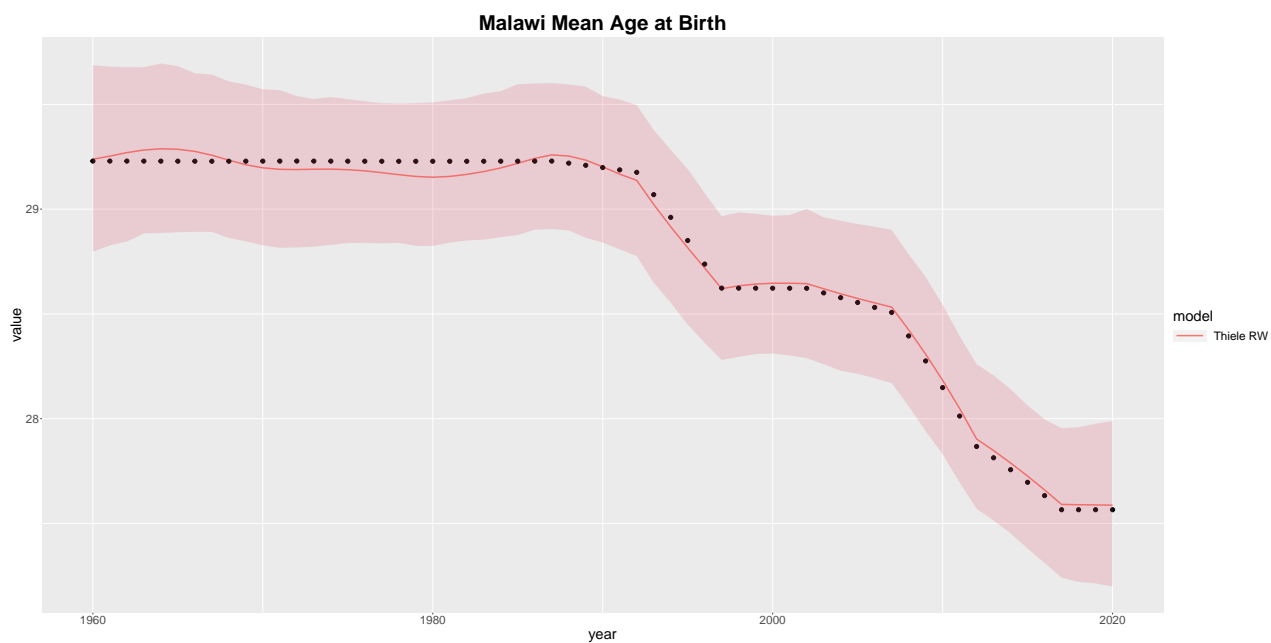


Figure 20: Mean age at births

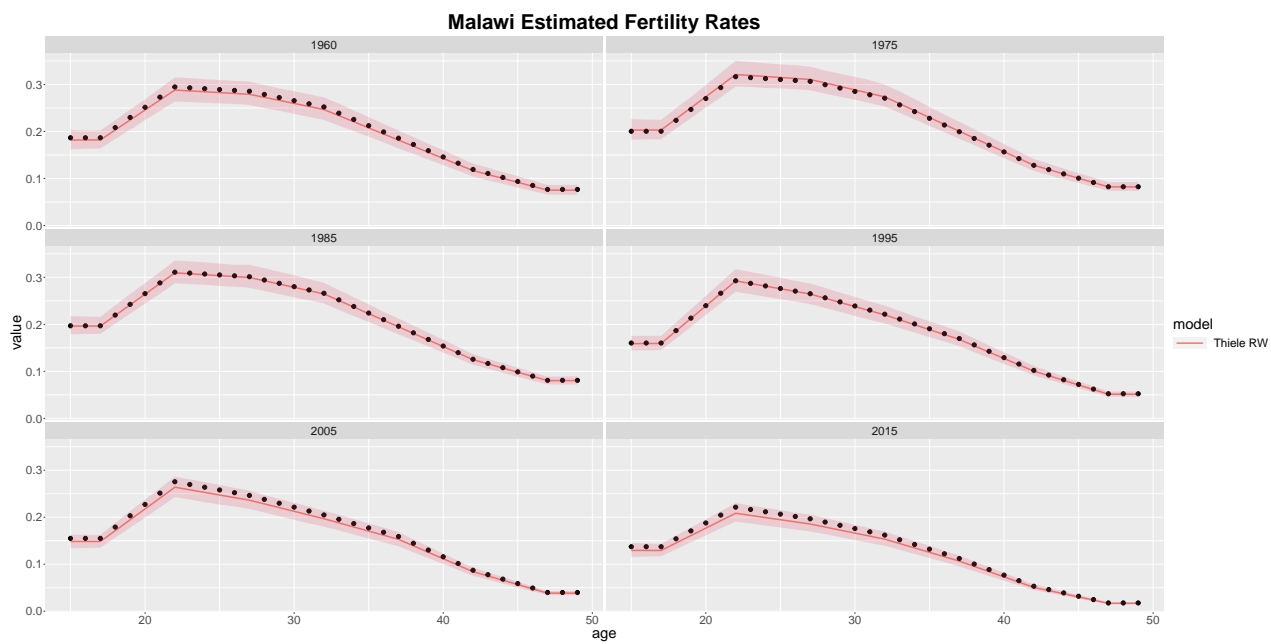


Figure 21: Fertility

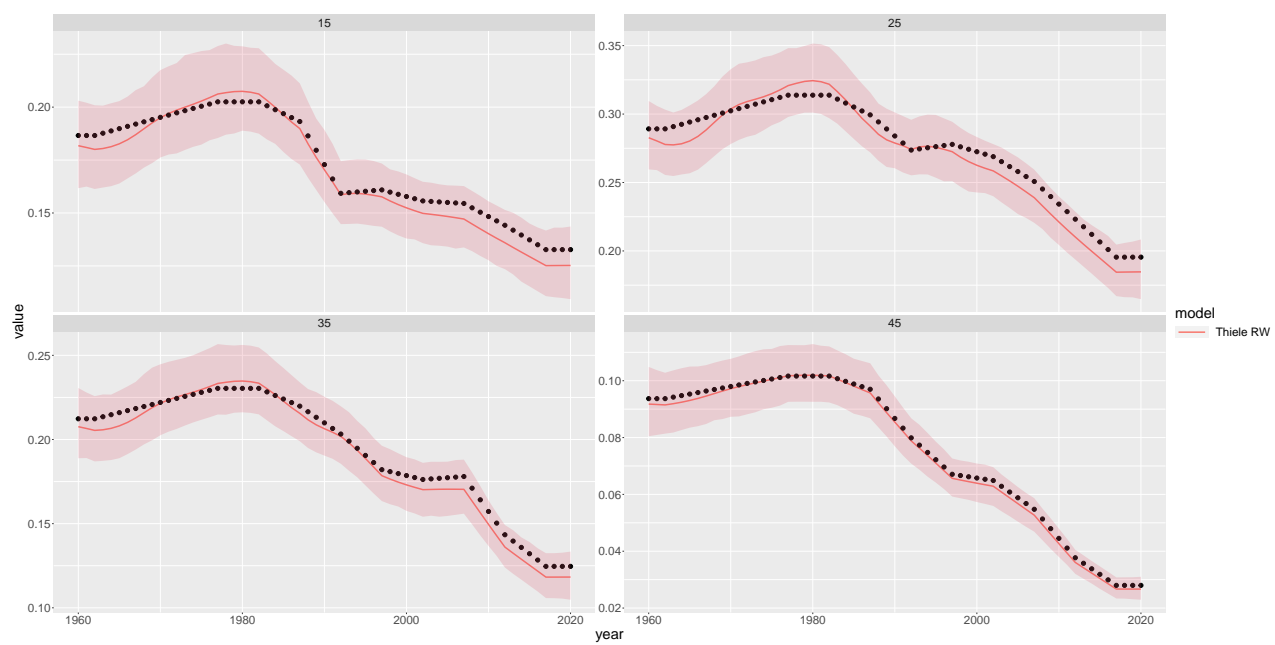


Figure 22: Fertility