# Chad

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

```
## # A tibble: 18 x 3
##    aggr.age  `1993`   `2009`
##  *    <dbl>   <dbl>    <dbl>
##  1        0 562409. 1101503.
##  2        5 500500.  931991.
##  3       10 401707.  711849.
##  4       15 317016.  562362.
##  5       20 269428.  489393.
##  6       25 239247.  421552.
##  7       30 199817.  341396.
##  8       35 162208.  267779.
##  9       40 132464.  207156.
## 10       45 104416.  156552.
## 11       50  82104.  117108.
## 12       55  63802.   85960.
## 13       60  52006.   67598.
## 14       65  39956.   52302.
## 15       70  38176.   38355.
## 16       75  37582.   26391.
## 17       80     NA    16551.
## 18       85     NA    19565.
```

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

```
## # A tibble: 18 x 3
##    aggr.age  `1993`   `2009`
##  *    <dbl>   <dbl>    <dbl>
##  1        0 567470. 1130761.
##  2        5 510473.  964574.
##  3       10 408514.  729538.
##  4       15 298617.  522475.
##  5       20 225577.  397175.
##  6       25 191518.  325200.
##  7       30 166186.  279434.
##  8       35 139564.  244519.
##  9       40 114484.  209622.
## 10       45  91839.  173042.
## 11       50  73183.  136213.
## 12       55  58250.  102671.
## 13       60  48631.   79671.
## 14       65  38604.   61274.
## 15       70  37058.   46124.
## 16       75  41378.   32356.
## 17       80     NA    20802.
## 18       85     NA    25930.
```

***Thiele log-Normal Hump RW***

```
## Warning in fit_tmb(input.thiele.loghump.oag.vec.RW, inner_verbose = FALSE, :
## convergence error: false convergence (8)
```

```
##    user  system elapsed
##   35.90    0.50   36.78
```

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

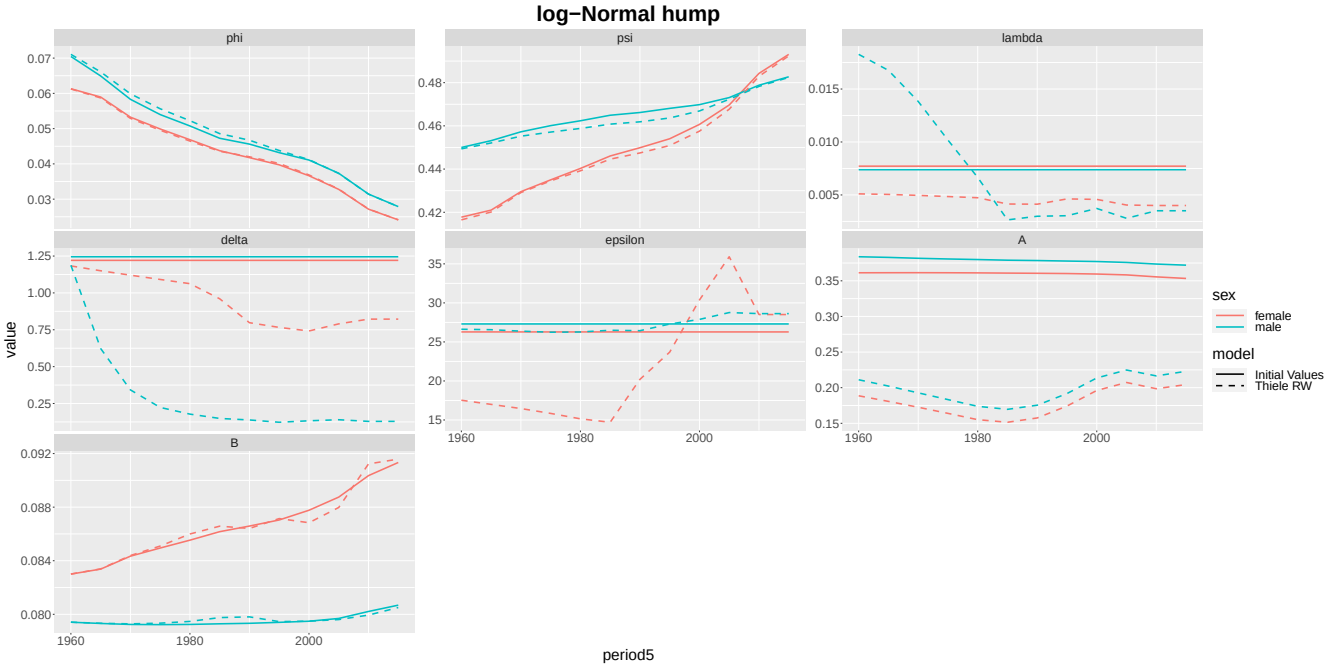


Figure 1: Estimated parameters


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

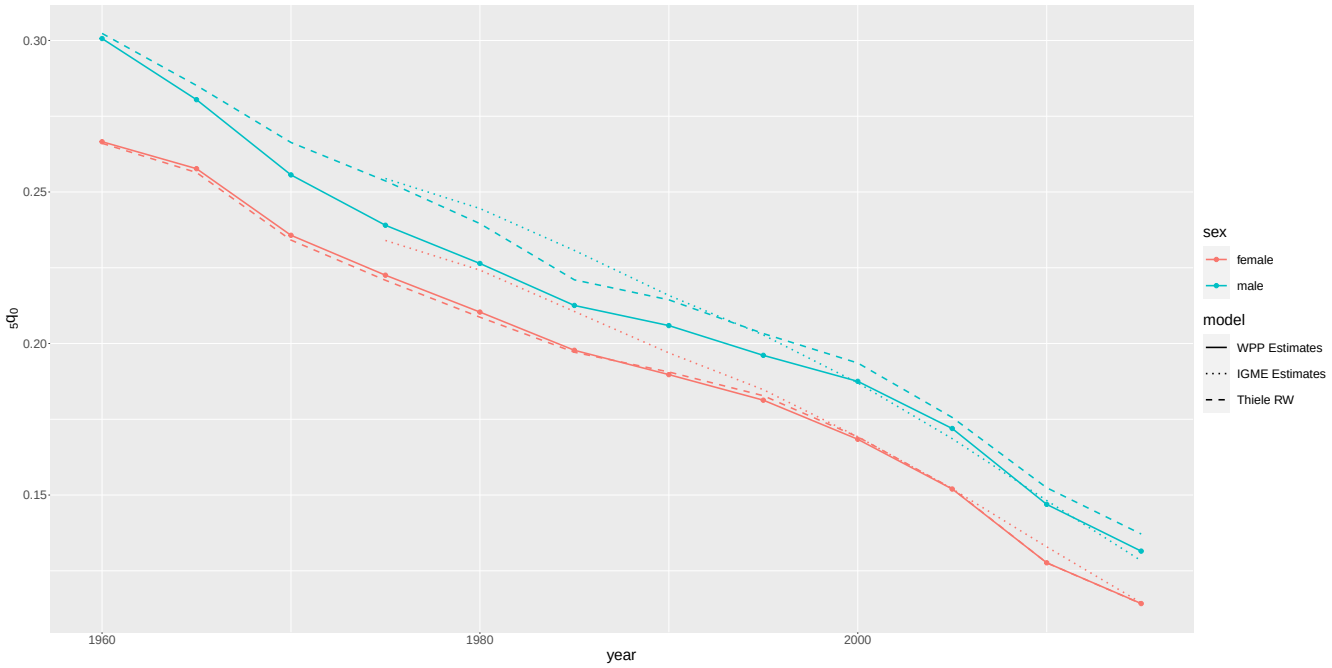


Figure 3: Estimated ${}_{5}q_{0}$

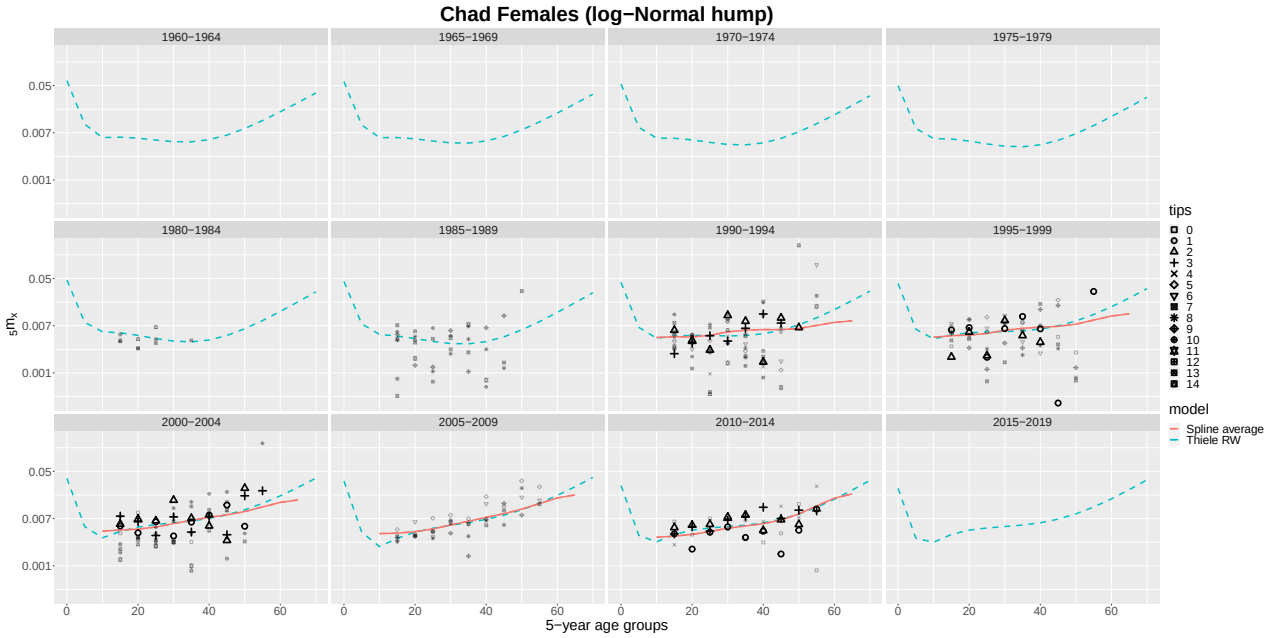


Figure 4: Mortality Schedules

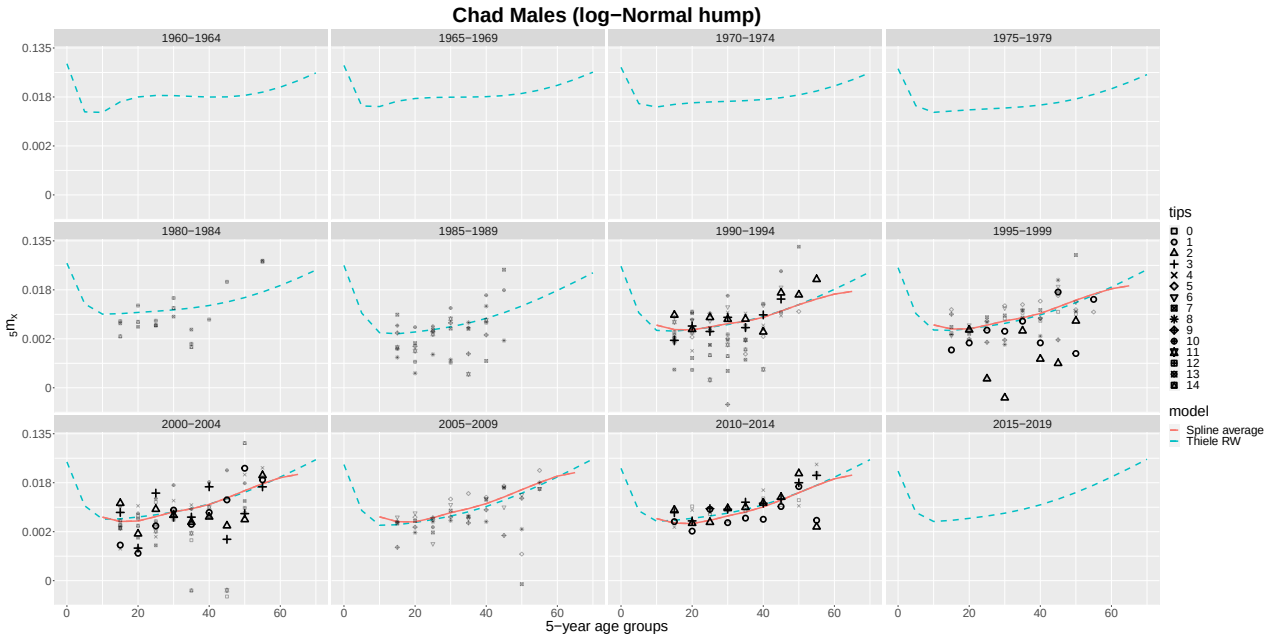


Figure 5: Mortality Schedules

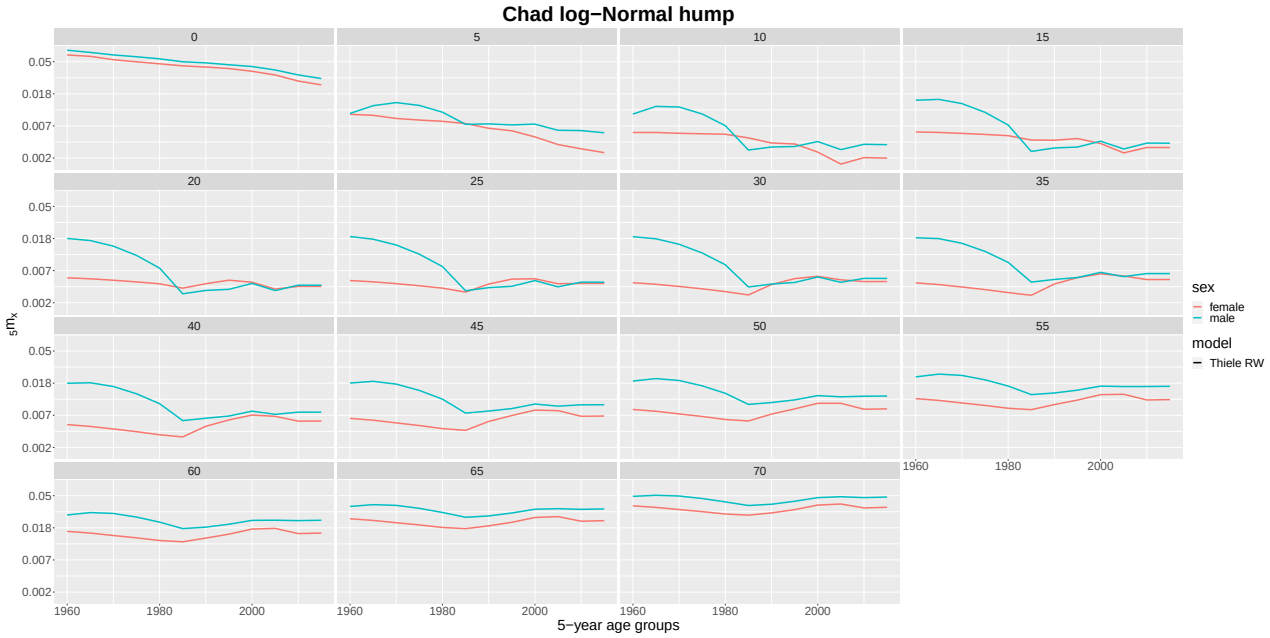


Figure 6: Mortality Schedules

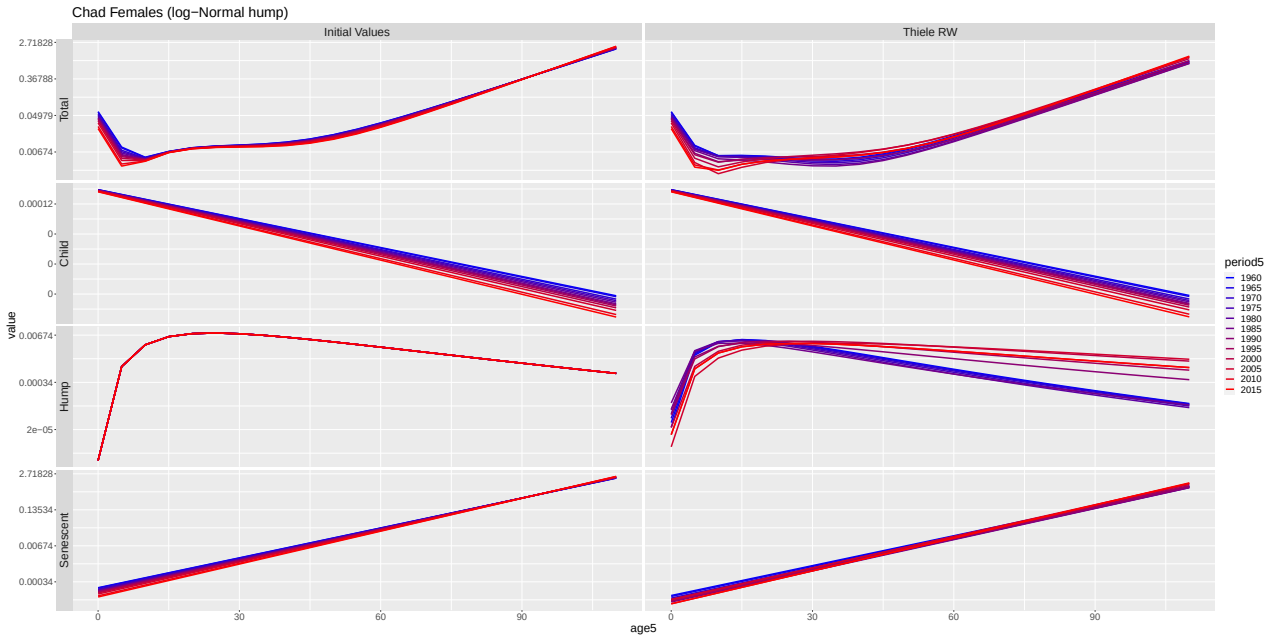


Figure 7: Thiele Decomposed

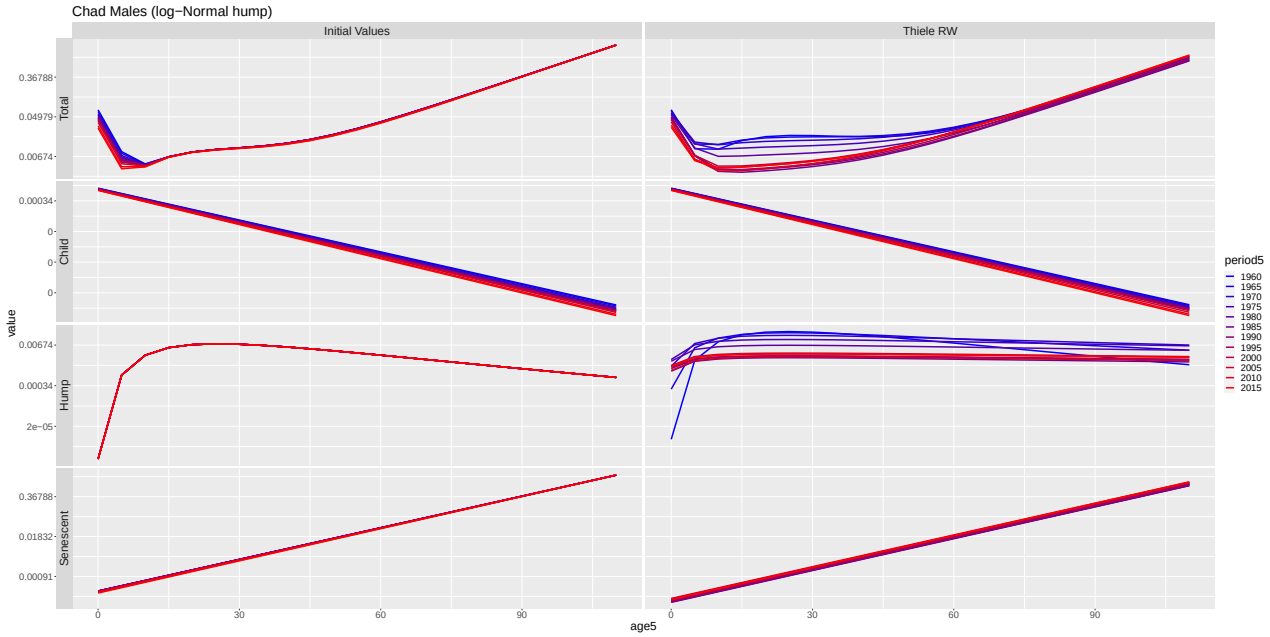


Figure 8: Thiele Decomposed

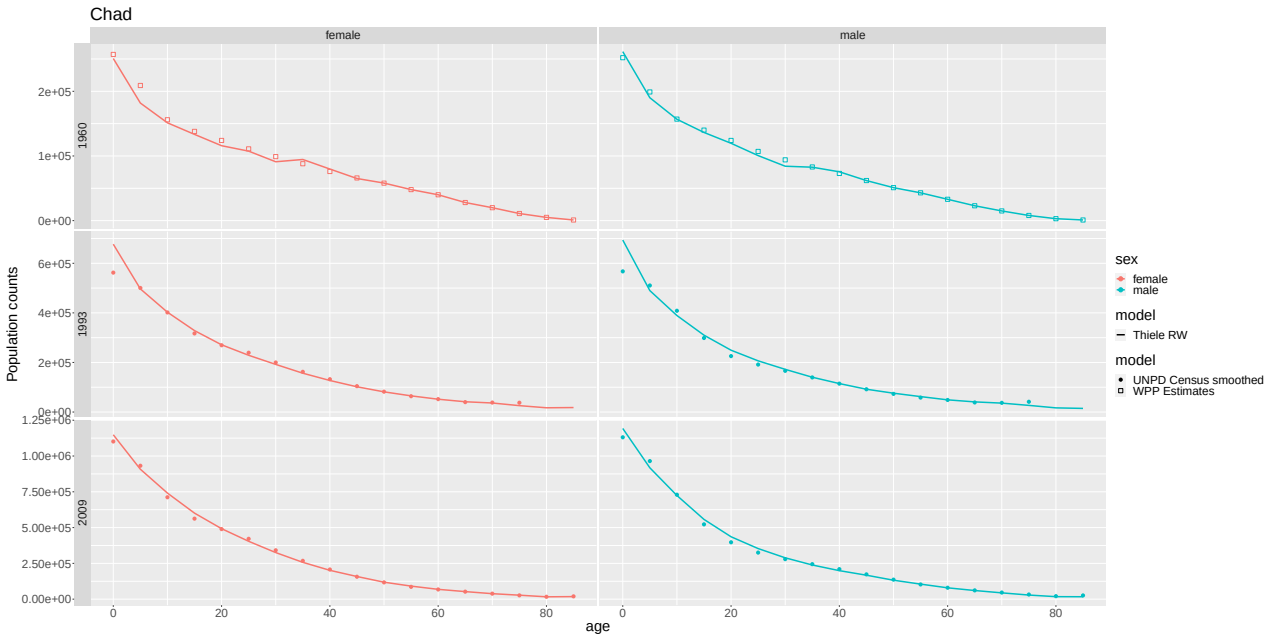


Figure 9: Population

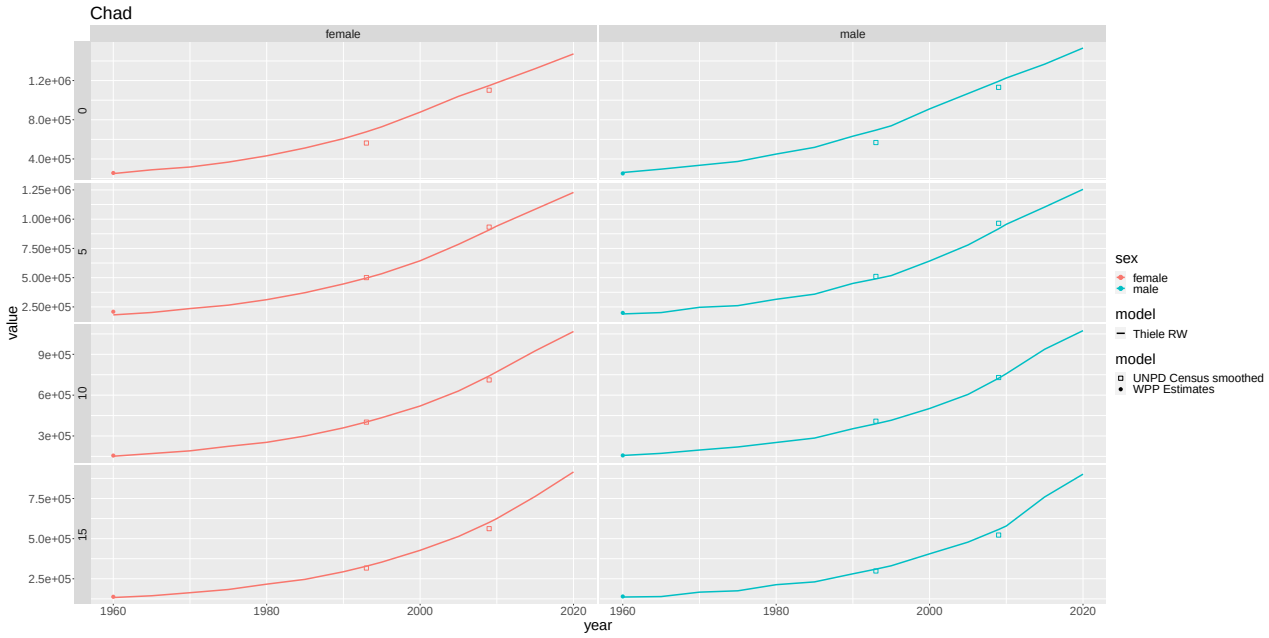


Figure 10: Population

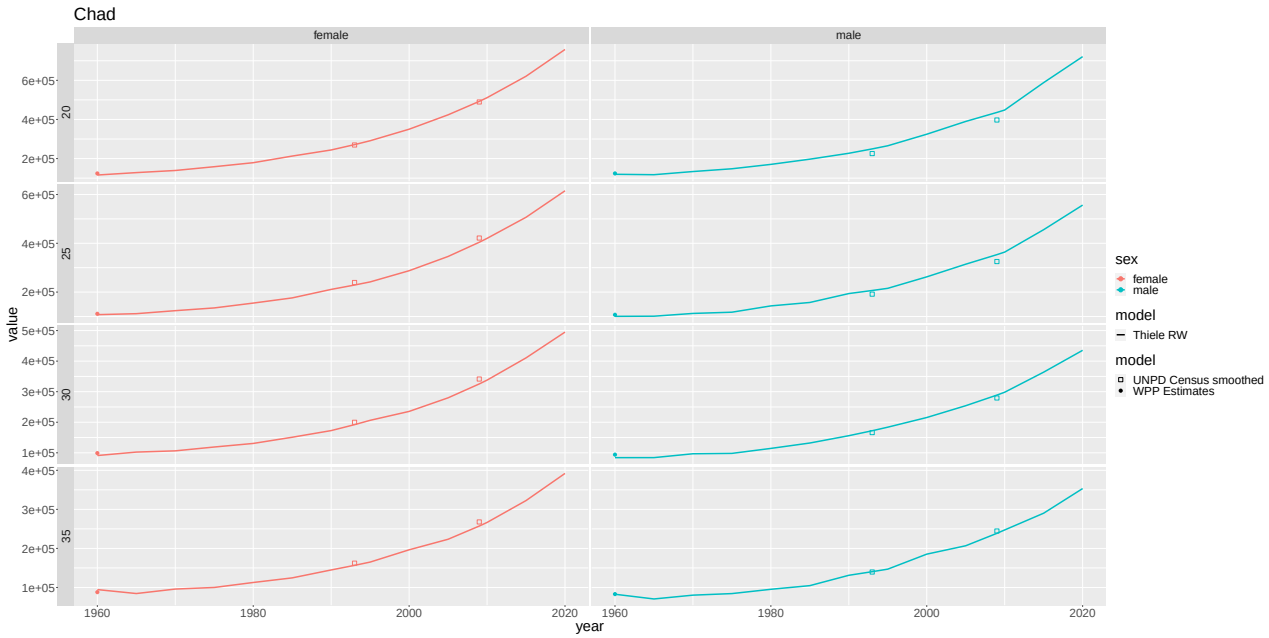


Figure 11: Population

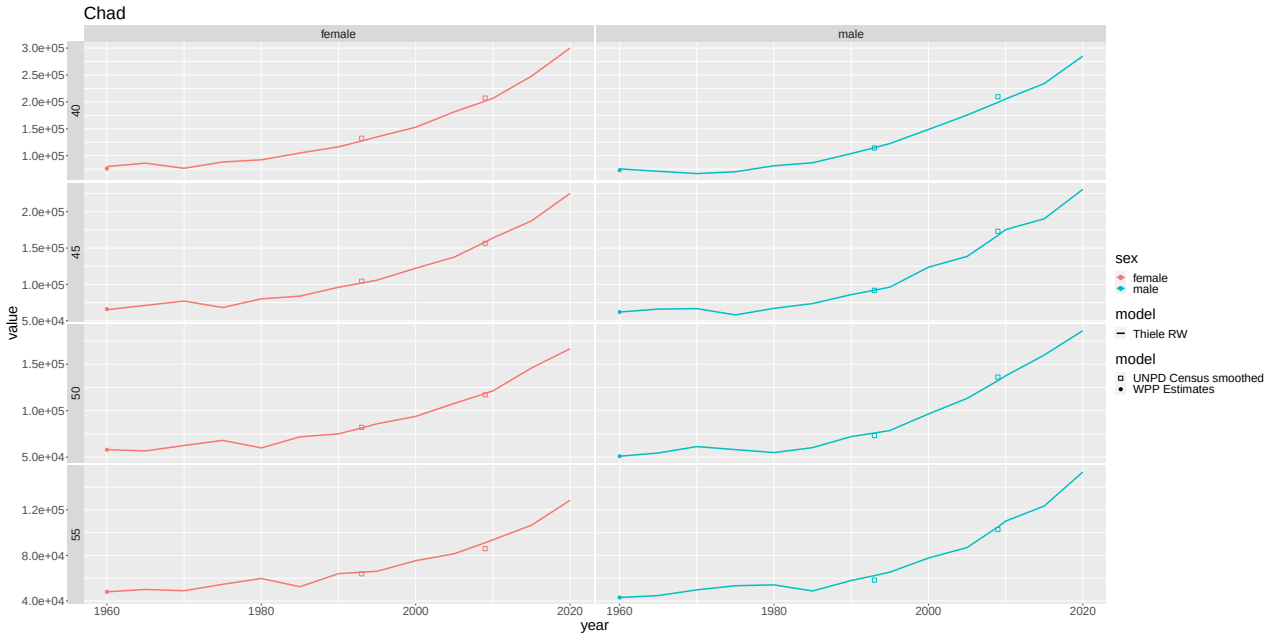


Figure 12: Population

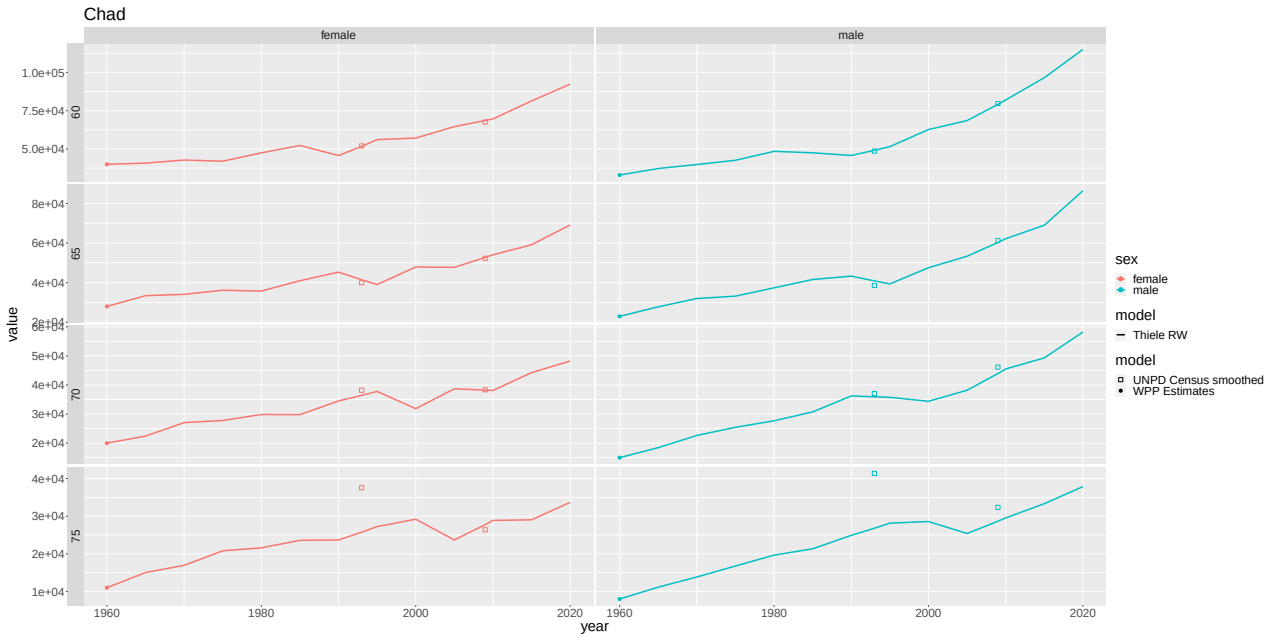


Figure 13: Population

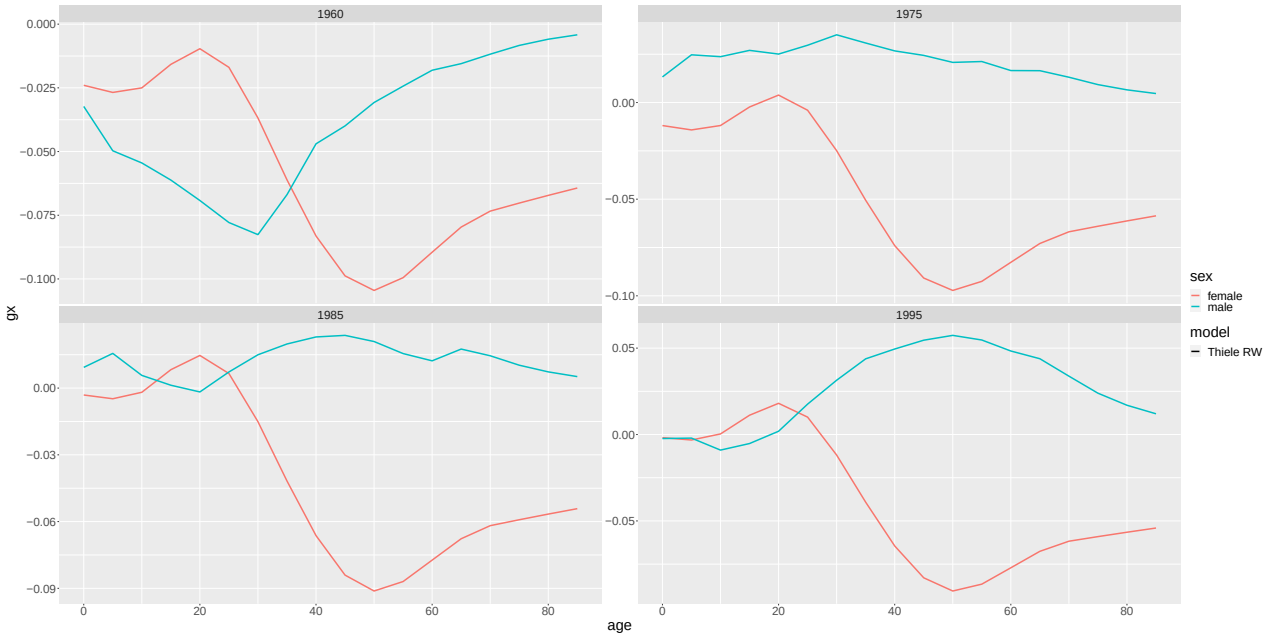


Figure 14: Migration

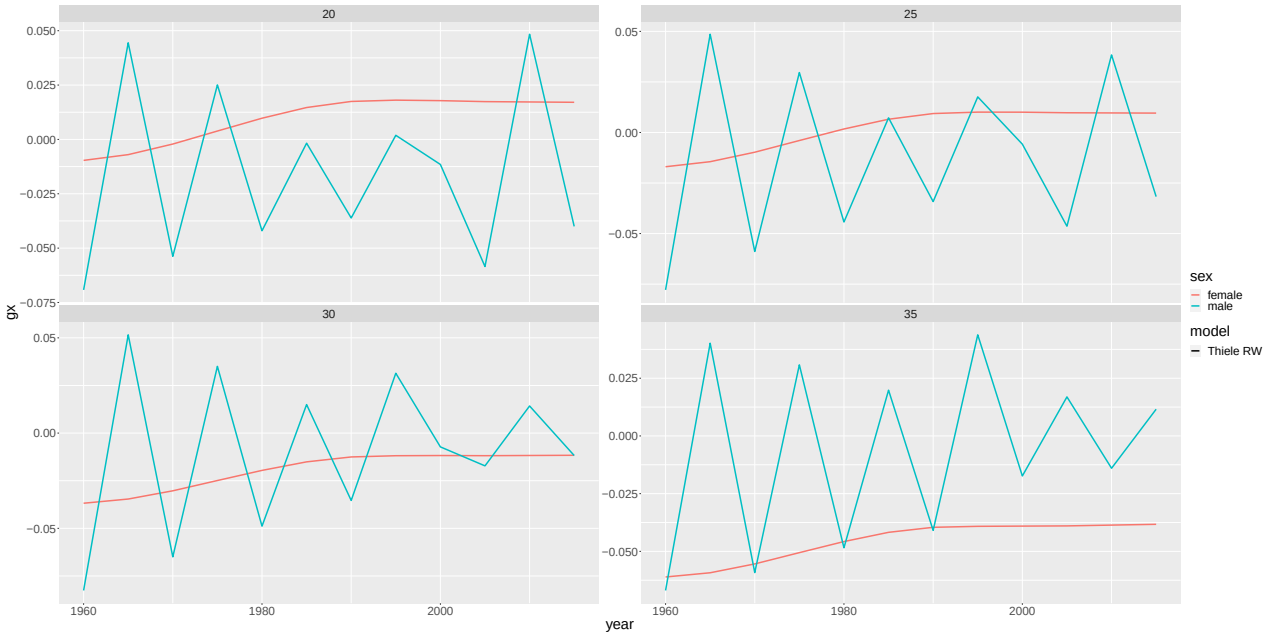


Figure 15: Migration

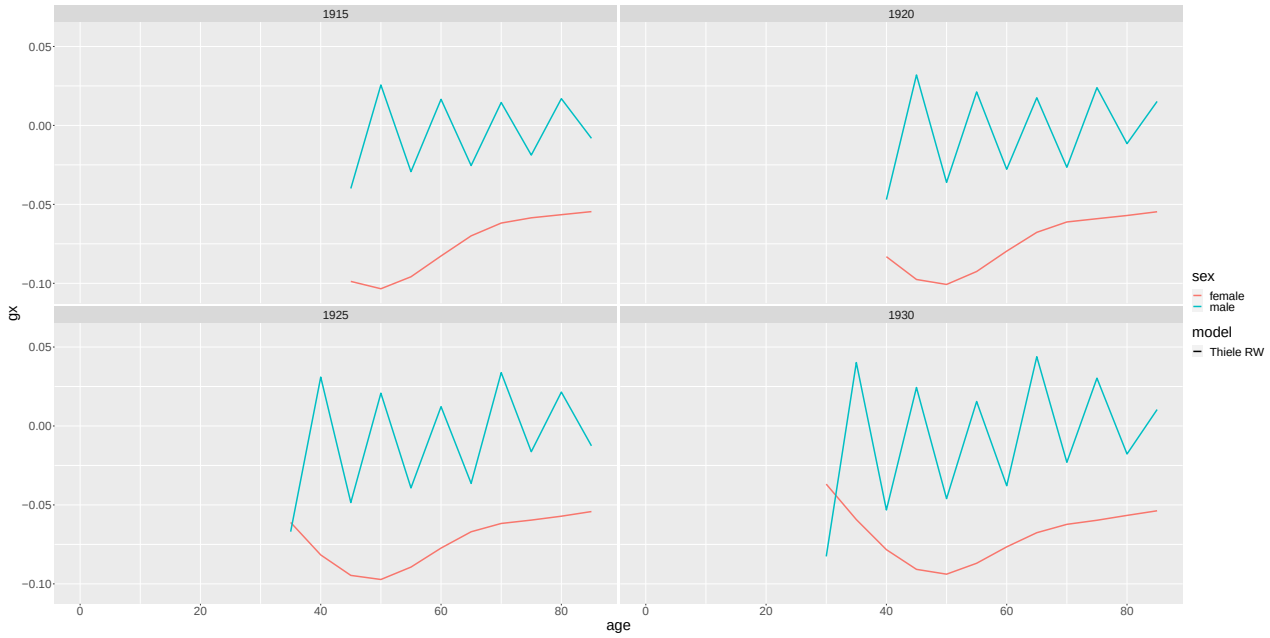


Figure 16: Migration

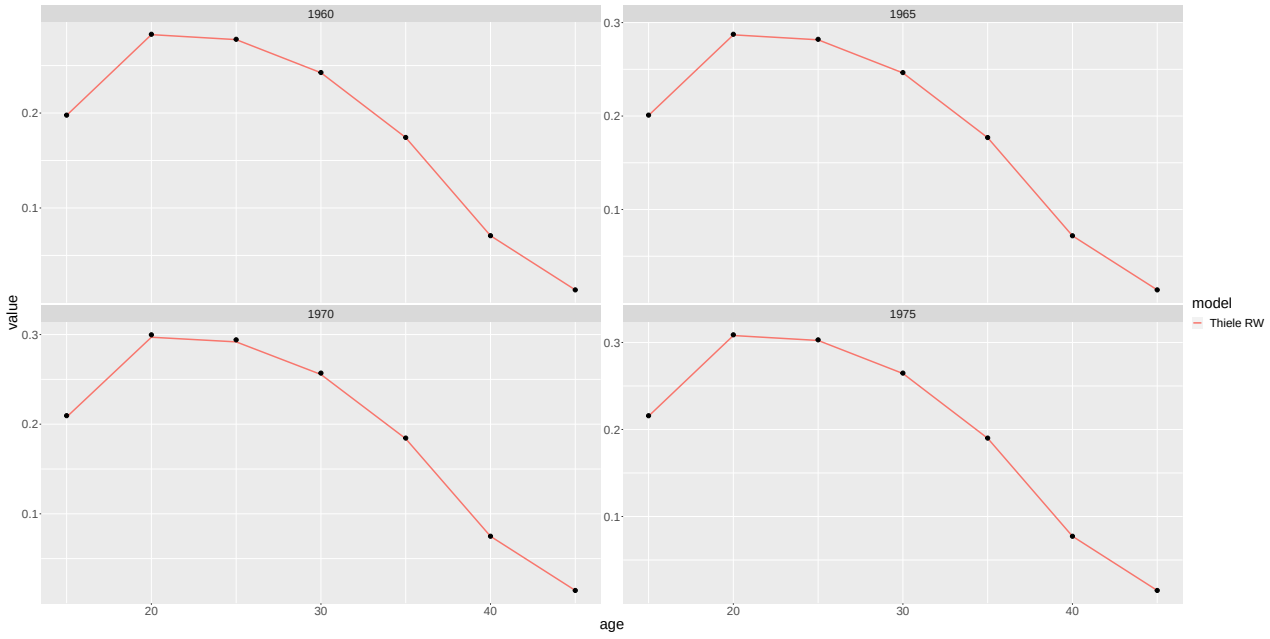


Figure 17: Fertility

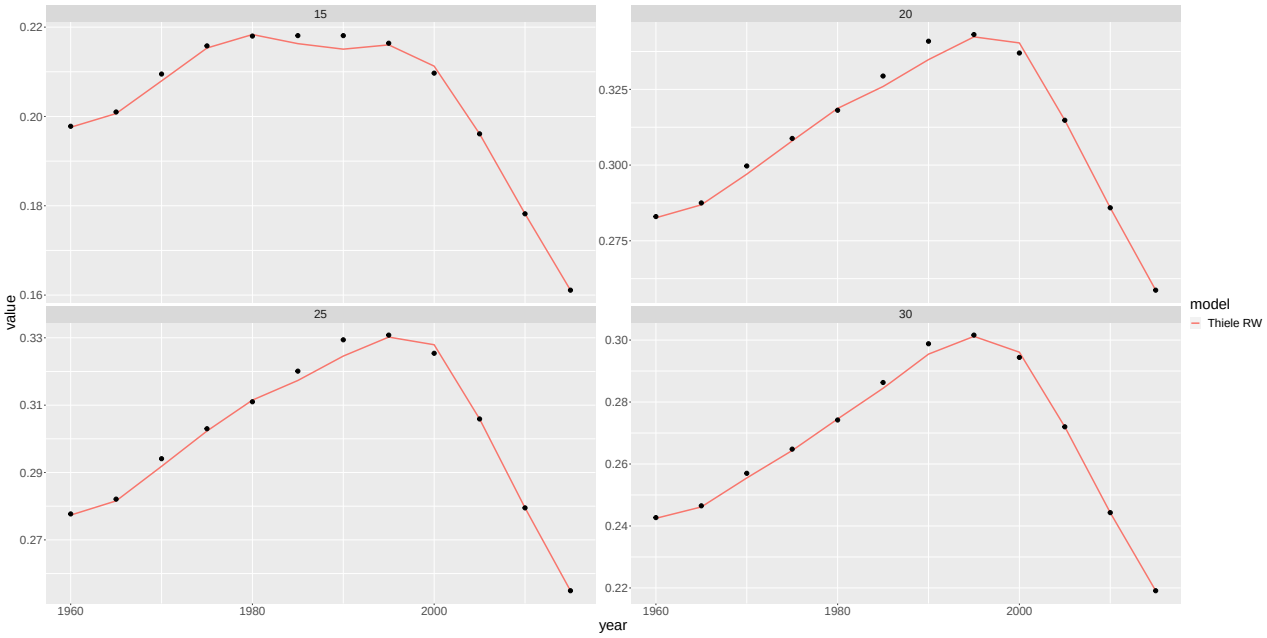


Figure 18: Fertility