Contents

1 War, hunger, and aging curves — Full Results

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2 Methods

2.1 Study question

We test how **war** (conflict intensity) and **hunger** (food insecurity indicators) perturb the shape of age-specific adult mortality curves. In stable settings, adult mortality hazard increases approximately exponentially with age (Gompertz law). Crisis settings may instead add an age-independent hazard (Makeham term), introduce a young-adult "hump" (violence signature), or potentially change the adult aging slope.

2.2 Mortality data (outcome)

We use **UN World Population Prospects (WPP) 2024** age-specific death rates (`mx`) by country, year, sex, and age. These are used as a standard approximation to the hazard within age bins.

Implementation: `scripts/30_export_wpp_from_r.R` exports `data/raw/wpp_mx.csv` (and `data/raw/wpp_mx.parquet` if the R `arrow` package is installed) with columns `iso3, year, sex, age, mx`.

2.3 Conflict intensity (war covariate)

We use **UCDP Battle-Related Deaths (BRD)** as annual battle deaths by country-year. We aggregate battle deaths to country-year and scale by population to obtain `battle_deaths_per_100k`.

Implementation: place the downloaded BRD CSV/XLSX into `data/raw/ucdp/` and run `scripts/20_prepare_ucdp.py`.

2.4 Hunger / food insecurity (hunger covariates)

We fetch two World Bank WDI indicators: - `SN.ITK.DEFC.ZS`: prevalence of undernourishment (PoU, %) - `SN.ITK.MSFI.ZS`: prevalence of moderate or severe food insecurity (FIES, %)

Population for normalization is `SP.POP.TOTL`.

Implementation: `scripts/10_fetch_wdi.py`.

2.5 India SRS (optional add-on)

Separately from the cross-country war/hunger panel, we can apply the same "aging curve decomposition" idea to India's **SRS Abridged Life Tables (2018–22)** at the state/UT level and by residence: - Input: `SRS-Abridged_Life_Tables_2018-2022.pdf` (repo root) - Extraction: `scripts/05_extract_srs_life_tables.py` → `data/intermediate/srs_abridged_life_tables_2018_22.csv` - The abridged tables provide `nqx` over age intervals (e.g., `20-25`). We derive a hazard proxy for closed intervals: - mx
$approx -$
$ln(1 - nqx)/n$ (where `n` is the interval width) - The open-ended `85+` interval has `nqx` shown as `...` in the PDF, so `mx` is left missing.

We then fit the same GM/GMH models per `area × residence × sex` and compute **Urban — Rural** deltas: - Fit + deltas: `scripts/55_fit_srs_models.py` → `data/processed/srs_params.parquet`, `data/processed/srs_urban_rural_deltas.parquet`, `reports/figures/srs/`, `reports/tables/srs_*.csv`

2.6 Extra APIs (optional)

If your environment has internet access, there are optional fetchers for additional national series: - World Bank WDI (life expectancy + mortality): `scripts/11_fetch_wdi_extra.py` - WHO GHO (OData): `scripts/12_fetch_who_gho.py`

2.7 Mortality models

2.7.1 Gompertz–Makeham (adult fit)

On adult ages 40–89 we fit: $\mu(x) = c + ae^{bx}$ where: - `b` is the aging slope (MRDT = ln(2)/b), - `a` shifts the Gompertz component, - `c` is an age-independent extrinsic hazard (Makeham).

2.7.2 Young-adult hump extension (war signature)

To capture disproportionate young-adult violent mortality, we extend: $\mu(x) = c + ae^{bx} + h \exp\left(-\frac{(x-\mu_h)^2}{2\sigma_h^2}\right)$ with fixed hump center/width ($\mu_h = 28$, $\sigma_h = 10$) and estimated amplitude $h \geq 0$.

2.7.3 Estimation

We fit parameters by non-linear least squares minimizing the log-scale residual: $\log(mx) - \log(\mu(x;\theta))$ with positivity enforced by log-parameterization.

2.8 Event windows

For each case country we define: - pre: t0-5 … t0-1 - crisis: t0 … t1 - post: t1+1 … (if available)

Controls are selected a priori in `config/project.yml`.

2.9 Outputs

- **Panel (base):** `data/processed/panel_base.parquet`
- **Fitted params:** `data/processed/params.parquet`

- **Fit QC:** `data/processed/fit_qc.parquet`
- **WDI extra series (optional):** `data/intermediate/wdi_extra.parquet`
- **WHO GHO series (optional):** `data/intermediate/who_gho.parquet`
- **SRS (India) extracted table:** `data/intermediate/srs_abridged_life_tables_2018_22.csv`
- **SRS (India) fitted params:** `data/processed/srs_params.parquet`
- **SRS (India) Urban–Rural deltas:** `data/processed/srs_urban_rural_deltas.parquet`
- **SRS (India) figures:** `reports/figures/srs`
- **Figures:** `reports/figures`
- **Tables:** `reports/tables`

2.10 India (SRS) Add-on

This repo can also fit GM/GMH on India's SRS abridged life tables (2018–22) by `area × residence × sex`.

Run:

```
python3 scripts/05_extract_srs_life_tables.py
python3 scripts/55_fit_srs_models.py
```

Key outputs:

- `data/intermediate/srs_abridged_life_tables_2018_22.csv` (tidy extraction + derived `mx`)
- `data/processed/srs_params.parquet` and `reports/tables/srs_params.csv`
- `data/processed/srs_urban_rural_deltas.parquet` and `reports/tables/srs_urban_rural_deltas.csv`
- Figures: `reports/figures/srs`

2.10.1 SRS Figures

2.11 Fit Summary

- Fits: **680** (rows in `data/processed/params.parquet`)
- Converged: **680** (100.0%)

2.11.1 Convergence Rate (sample)

iso3	sex	converged_rate
BGR	Female	1
BGR	Male	1
JOR	Female	1
JOR	Male	1
MAR	Female	1
MAR	Male	1
OMN	Female	1
OMN	Male	1
POL	Female	1
POL	Male	1
ROU	Female	1
ROU	Male	1
SYR	Female	1
SYR	Male	1
TUN	Female	1
TUN	Male	1
UKR	Female	1
UKR	Male	1

iso3	sex	converged_rate
YEM	Female	1
YEM	Male	1

2.12 Event-Window Summary (Cases)

case_group	iso3	sex	param	crisis_minus_pre
SYR_2011	SYR	Female	b	-0.004431
SYR_2011	SYR	Female	c	0.0002054
SYR_2011	SYR	Female	h	6.859e-05
SYR_2011	SYR	Female	mrdt	0.2909
SYR_2011	SYR	Male	b	-0.0137
SYR_2011	SYR	Male	c	-0.0001834
SYR_2011	SYR	Male	h	0.004174
SYR_2011	SYR	Male	mrdt	1.035
UKR_2022	UKR	Female	b	-0.003541
UKR_2022	UKR	Female	c	9.131e-05
UKR_2022	UKR	Female	h	-1.343e-05
UKR_2022	UKR	Female	mrdt	0.3101
UKR_2022	UKR	Male	b	-0.01378
UKR_2022	UKR	Male	c	8.71e-12
UKR_2022	UKR	Male	h	0.001508
UKR_2022	UKR	Male	mrdt	1.91
YEM_2015	YEM	Female	b	-0.0005103
YEM_2015	YEM	Female	c	-1.803e-05
YEM_2015	YEM	Female	h	-8.238e-05
YEM_2015	YEM	Female	mrdt	0.03672
YEM_2015	YEM	Male	b	-0.005231
YEM_2015	YEM	Male	c	-0.0005862
YEM_2015	YEM	Male	h	0.001992
YEM_2015	YEM	Male	mrdt	0.4172

Full CSV: `reports/tables/event_summary.csv`

2.13 Figures

2.13.1 YEM_2015 — YEM

2.13.1.1 Female

2.13.1.2 Male

2.13.2 SYR_2011 — SYR

2.13.2.1 Female

2.13.2.2 Male

2.13.3 UKR_2022 — UKR

2.13.3.1 Female

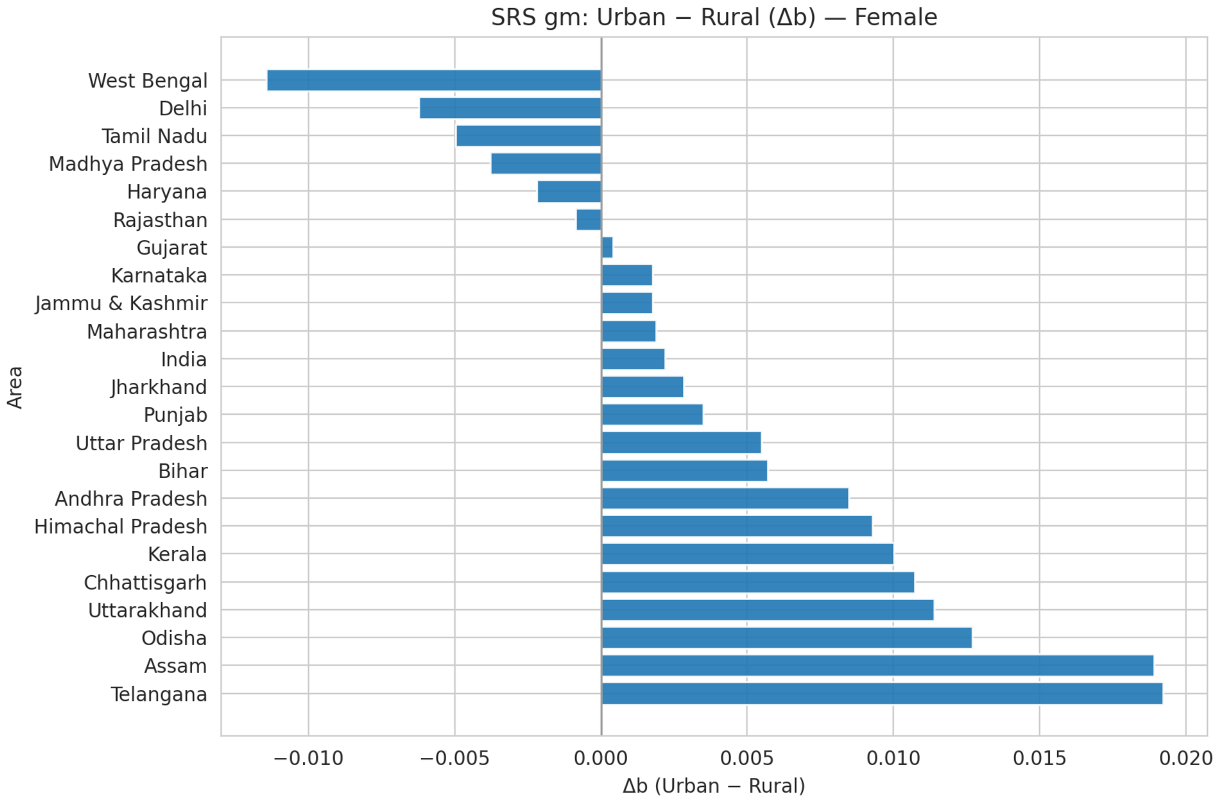

Figure 1: delta_b_urban_minus_rural_gm_Female

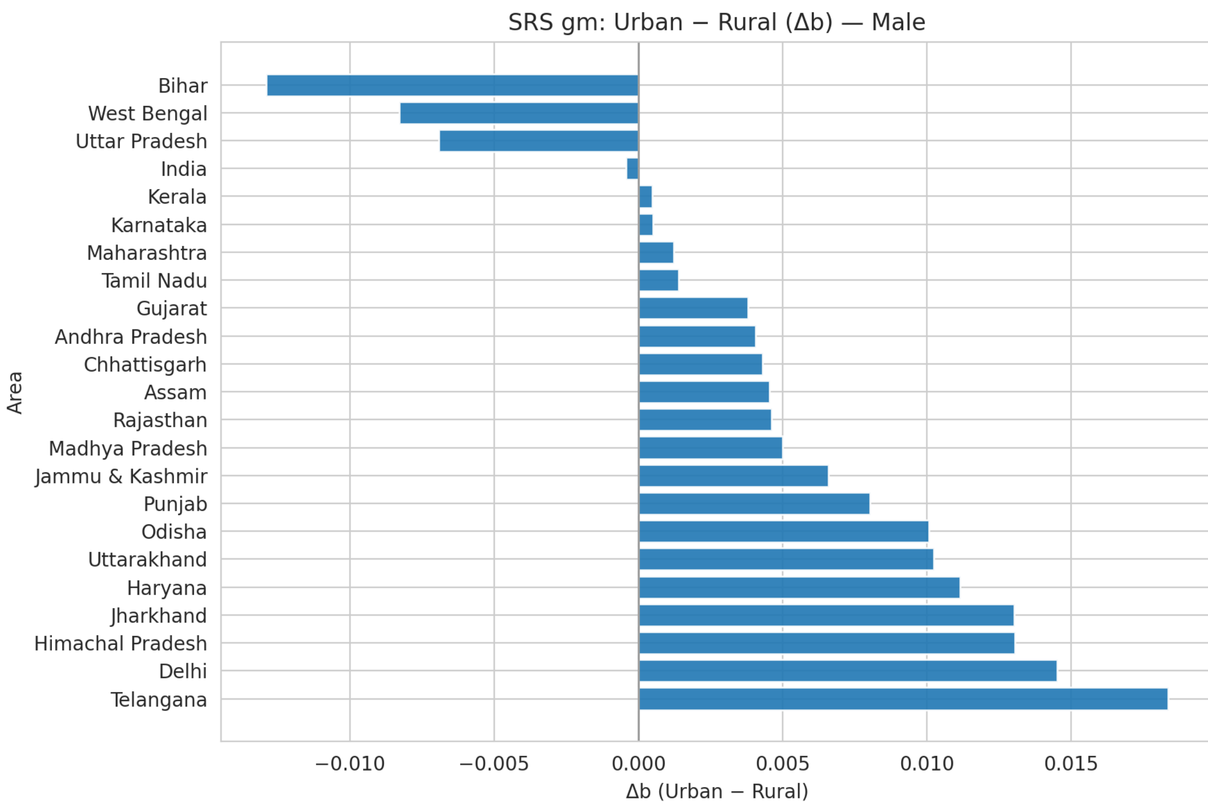

Figure 2: delta_b_urban_minus_rural_gm_Male

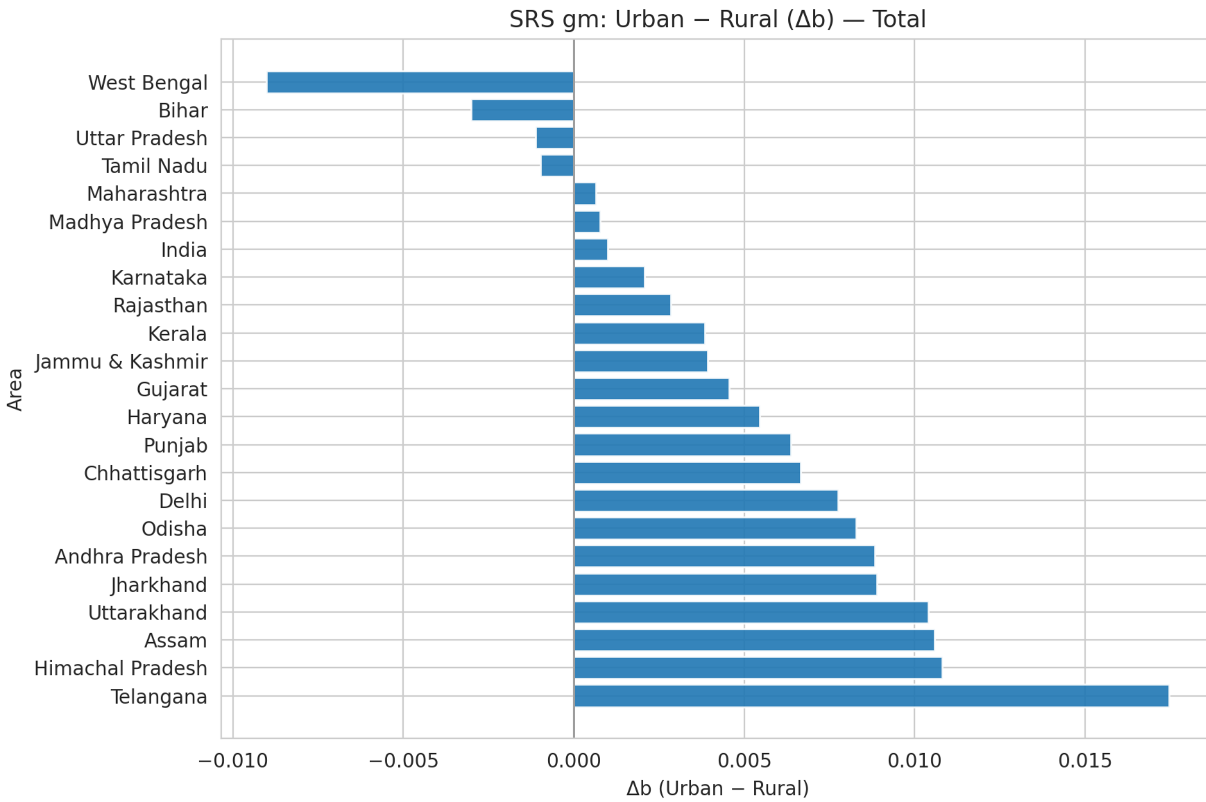

Figure 3: delta_b_urban_minus_rural_gm_Total

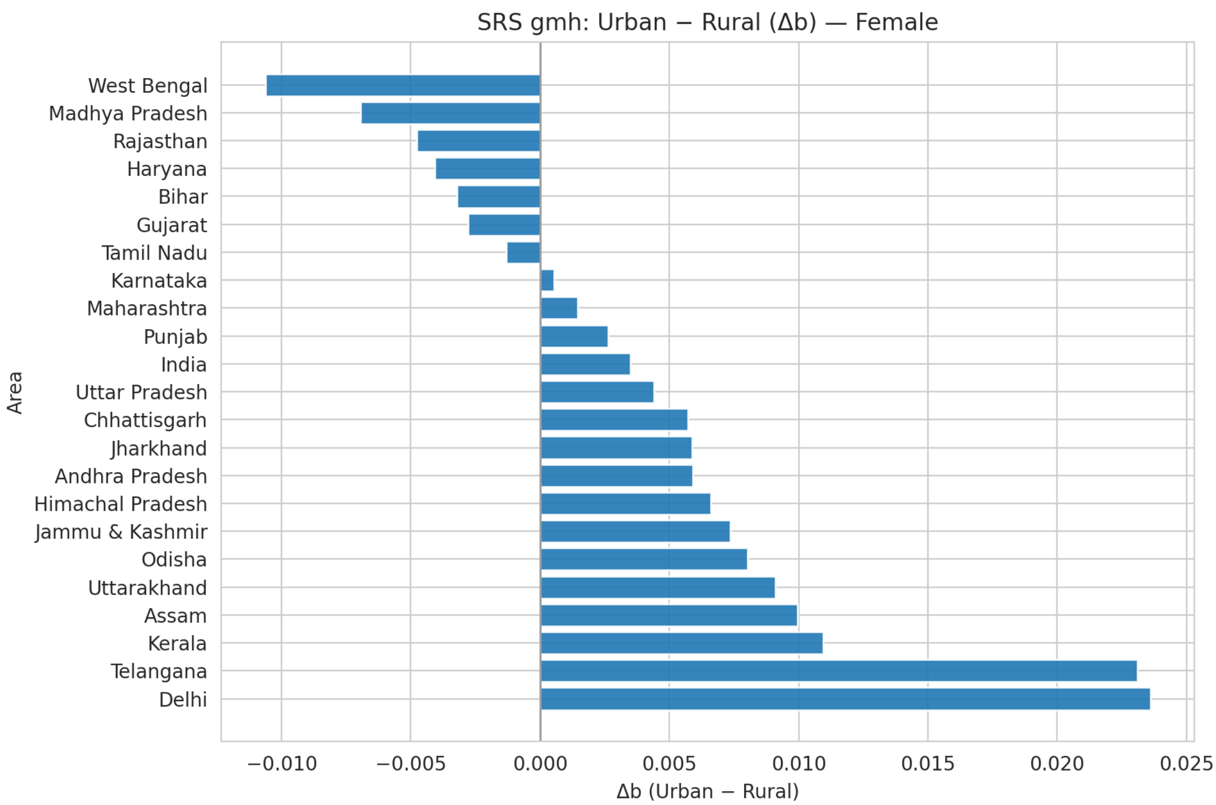

Figure 4: delta_b_urban_minus_rural_gmh_Female

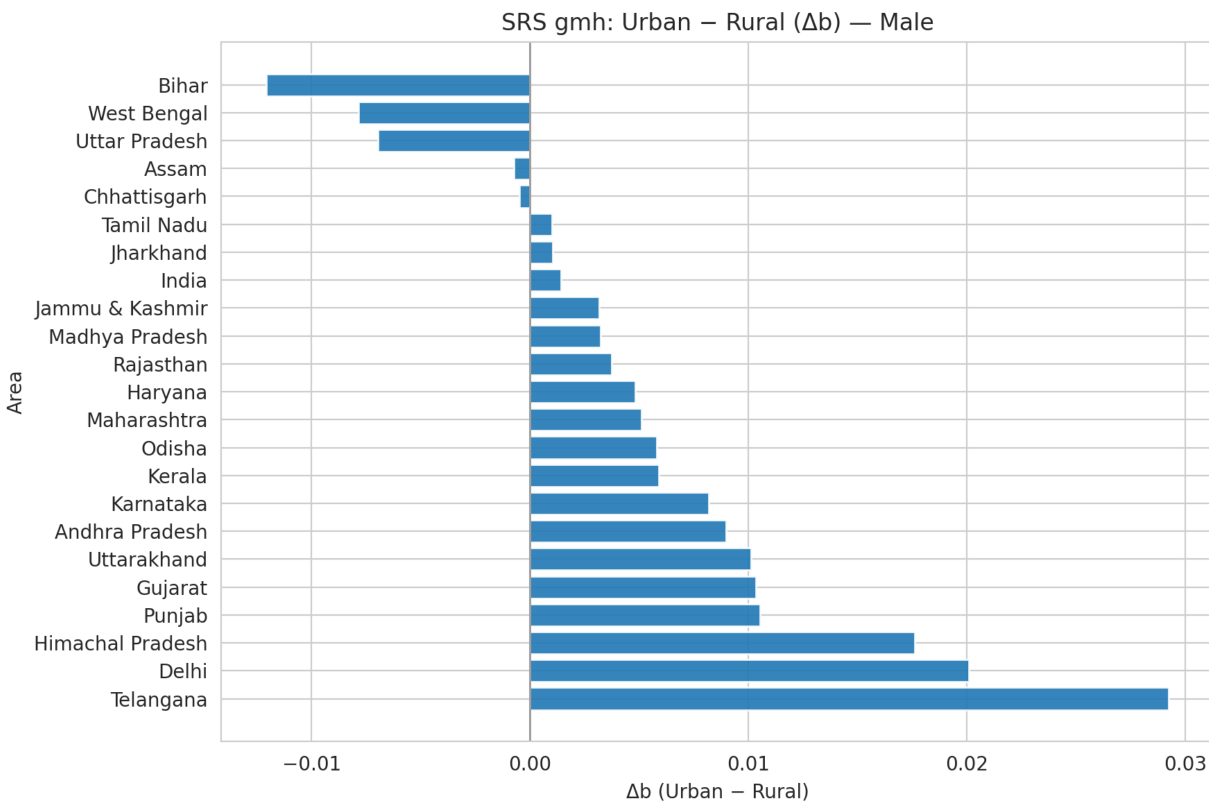

Figure 5: delta_b_urban_minus_rural_gmh_Male

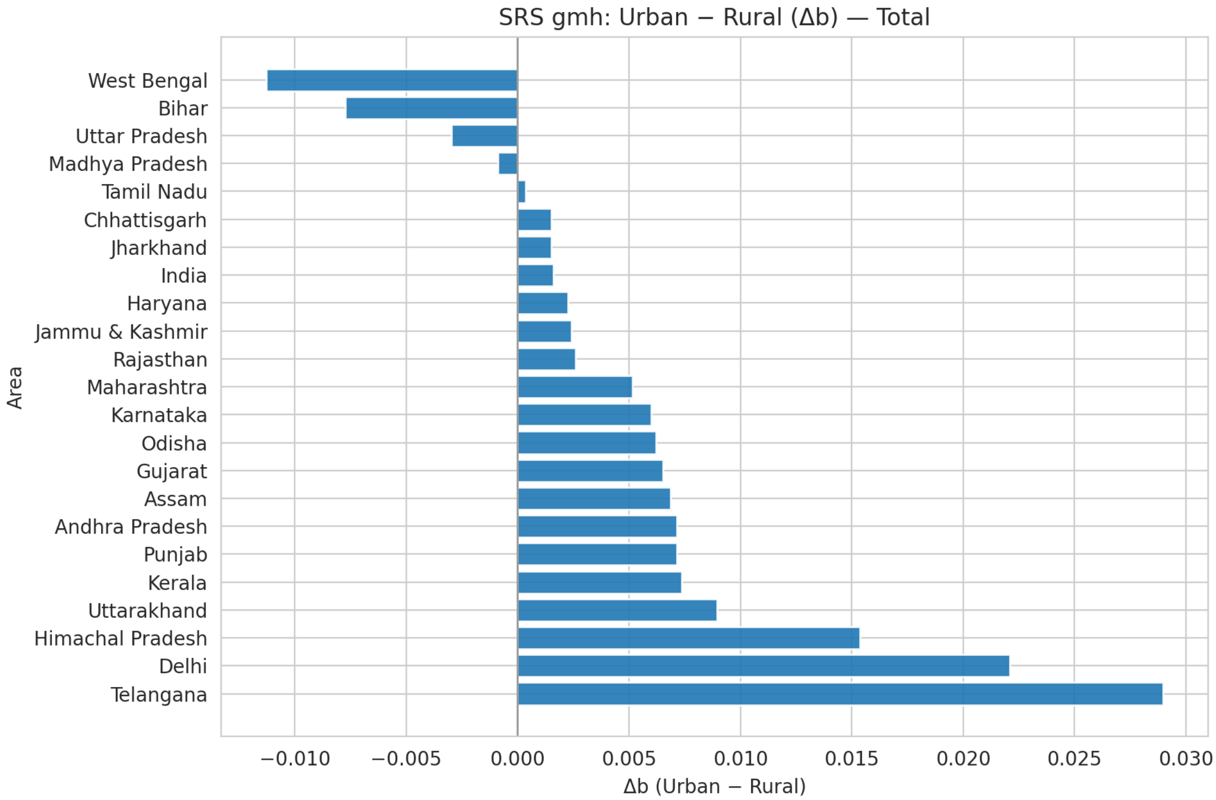

Figure 6: delta_b_urban_minus_rural_gmh_Total

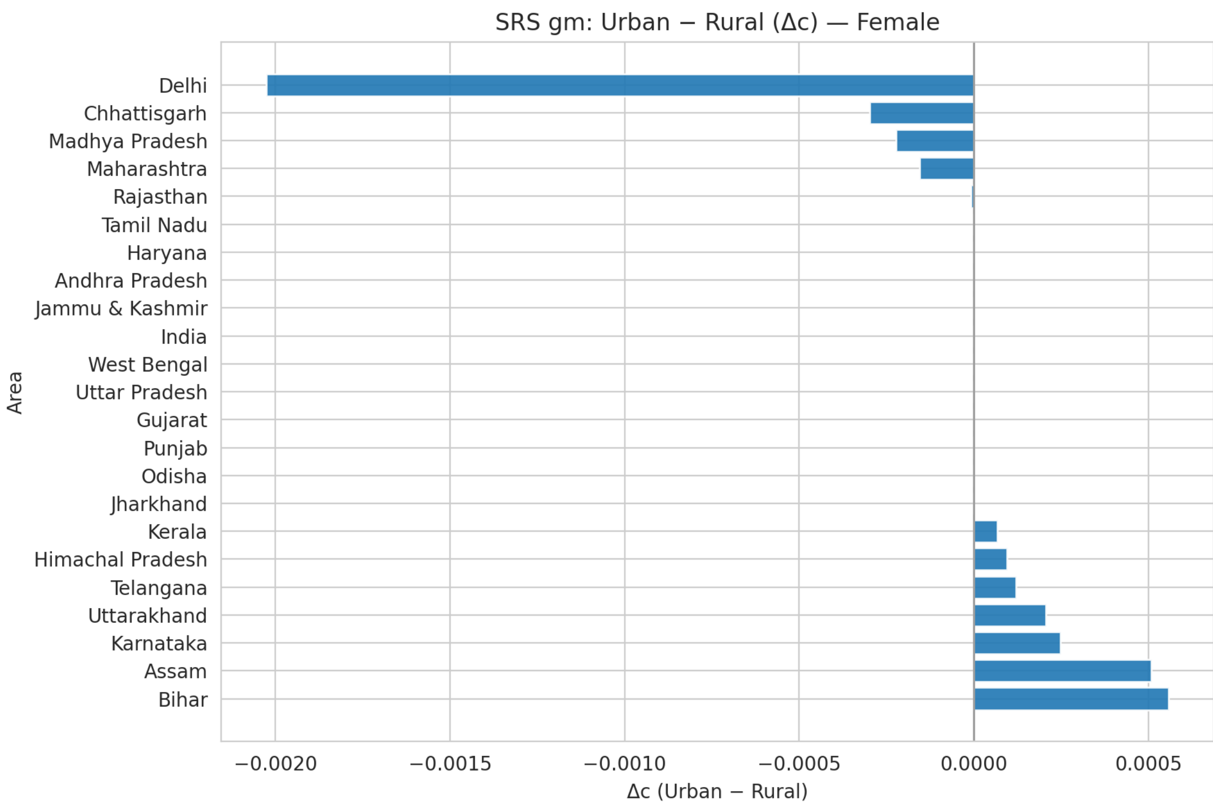

Figure 7: delta_c_urban_minus_rural_gm_Female

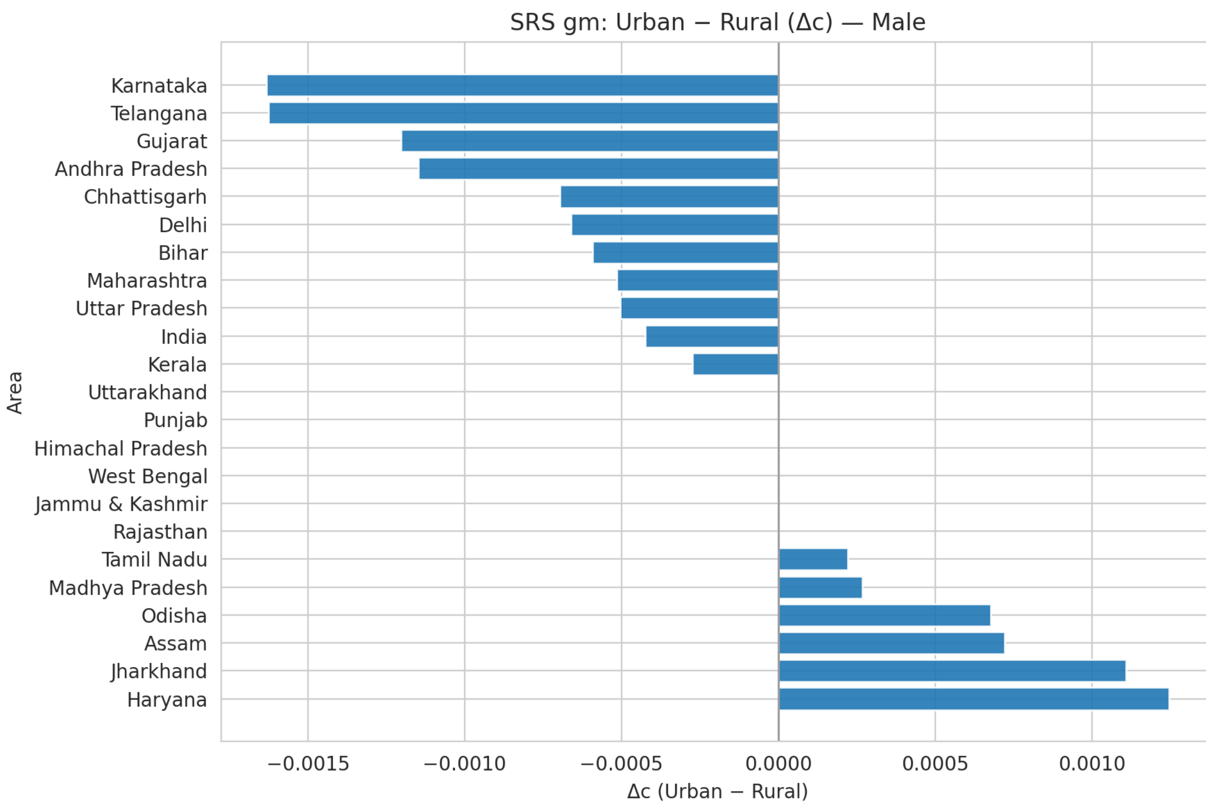

Figure 8: delta_c_urban_minus_rural_gm_Male

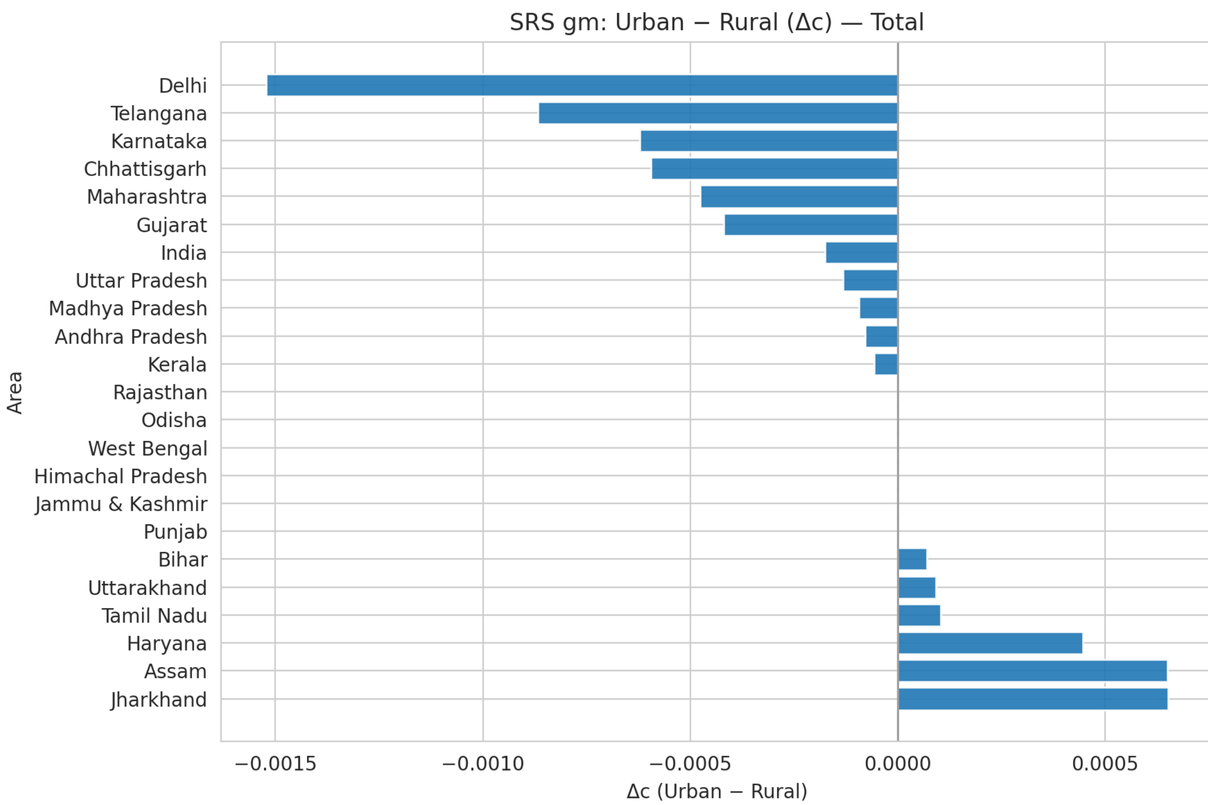

Figure 9: delta_c_urban_minus_rural_gm_Total

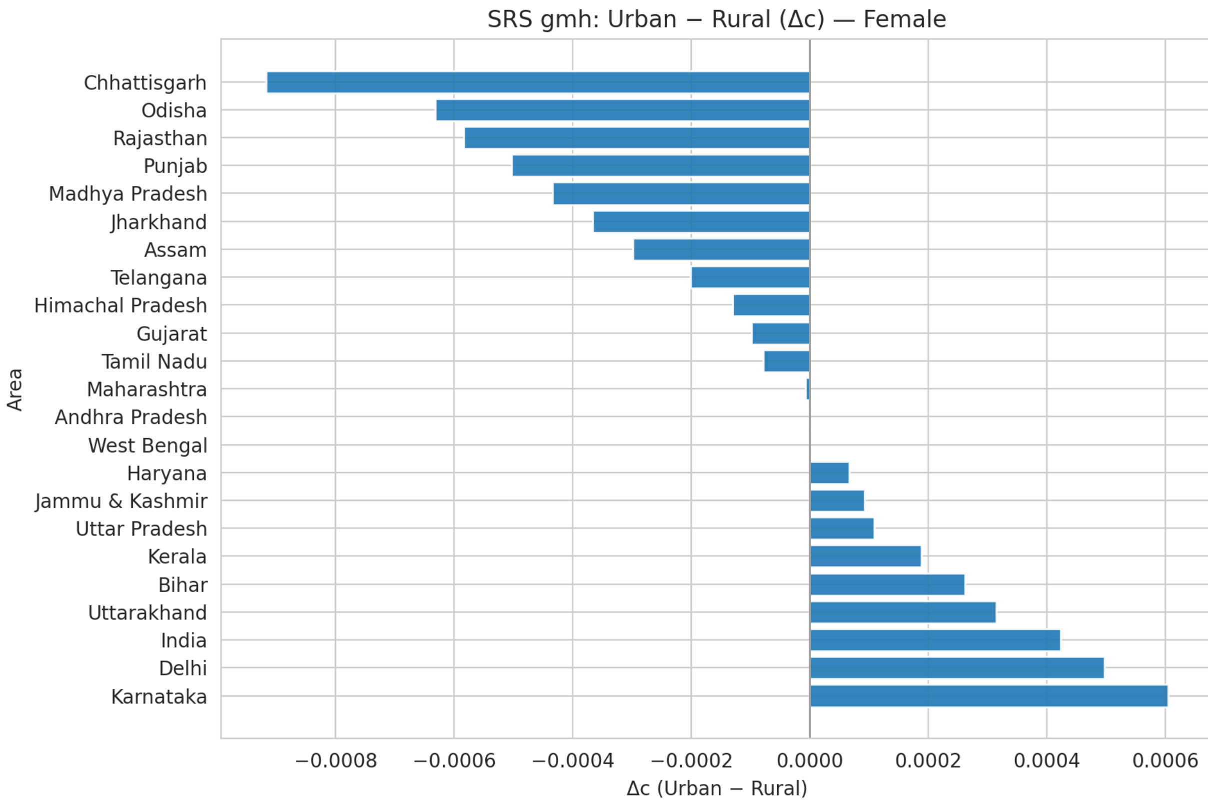

Figure 10: delta_c_urban_minus_rural_gmh_Female

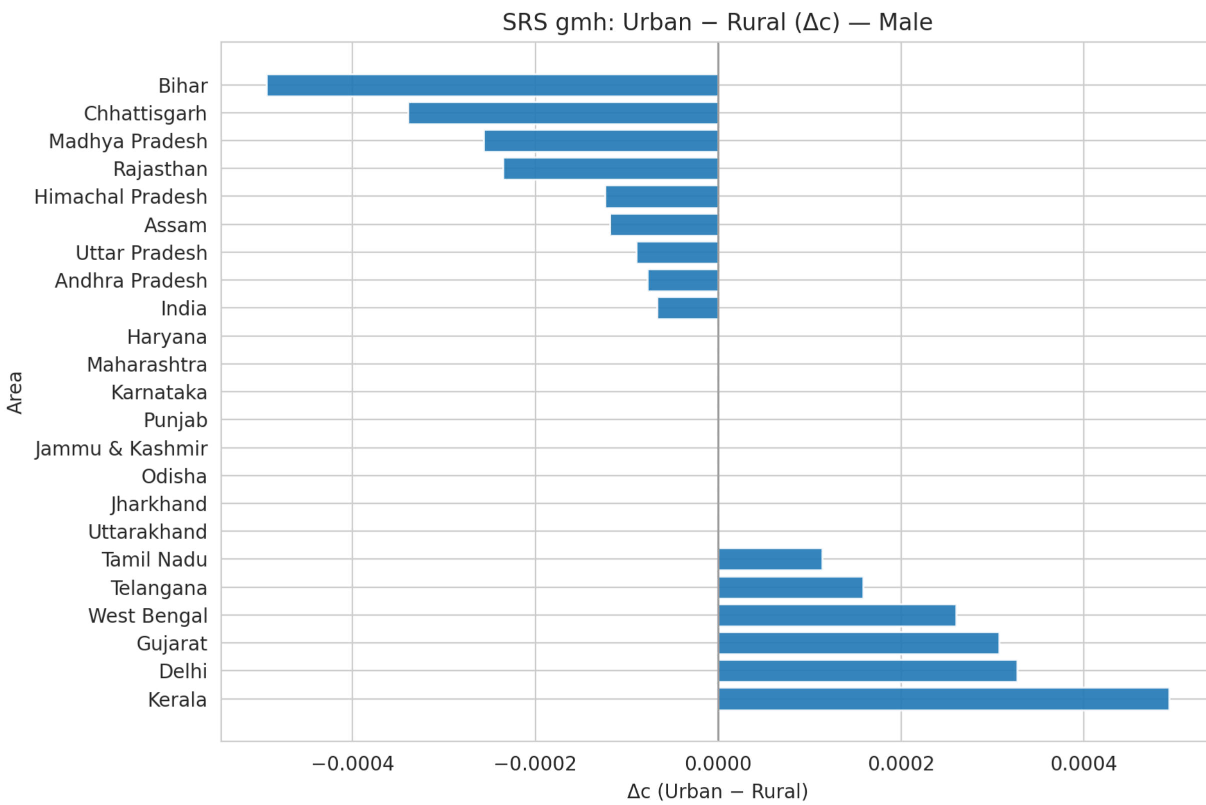

Figure 11: delta_c_urban_minus_rural_gmh_Male

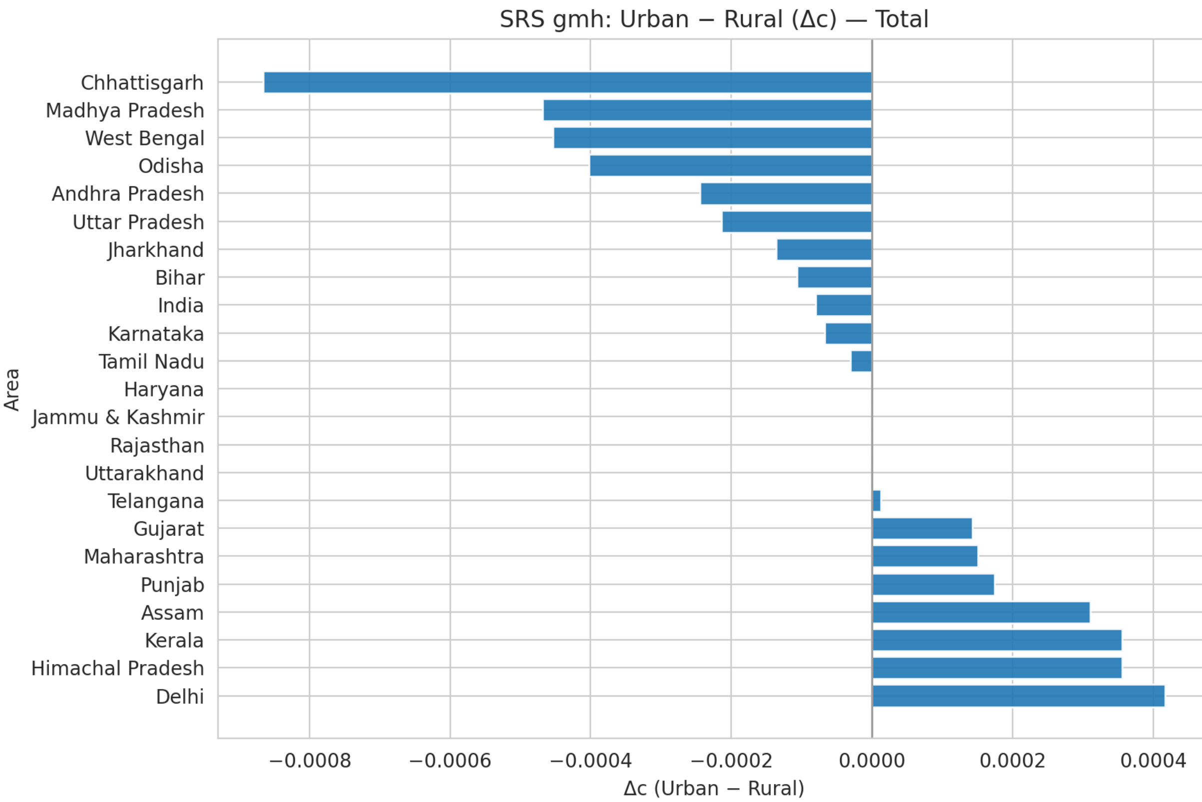

Figure 12: delta_c_urban_minus_rural_gmh_Total

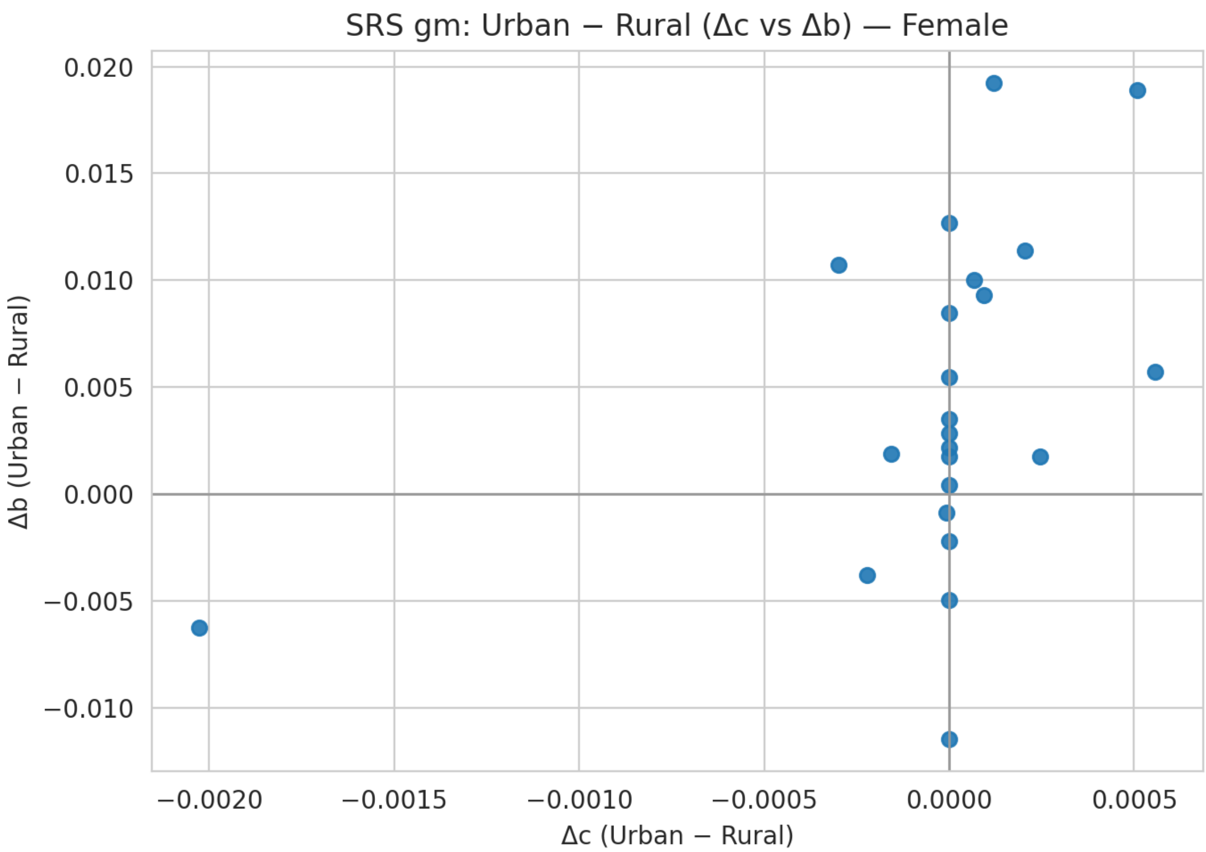

Figure 13: delta_cb_urban_minus_rural_gm_Female

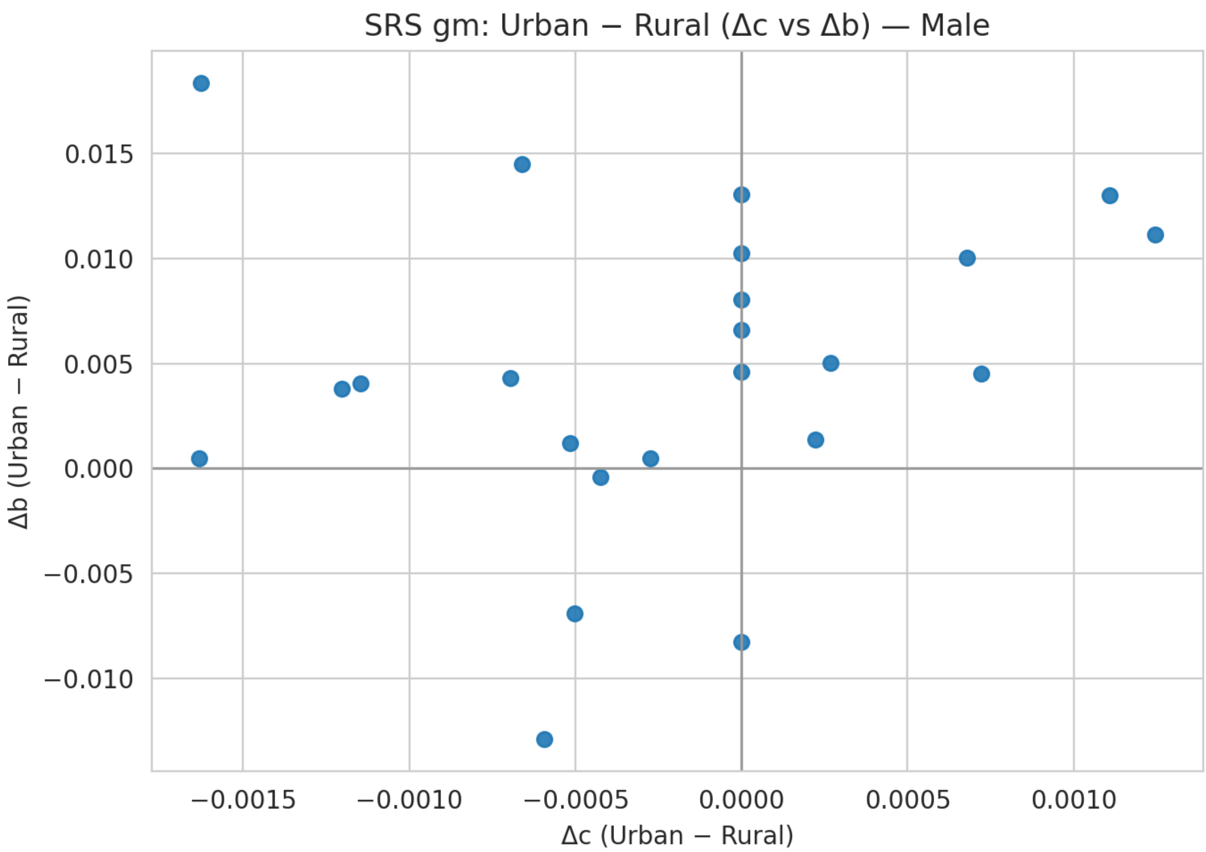

Figure 14: delta_cb_urban_minus_rural_gm_Male

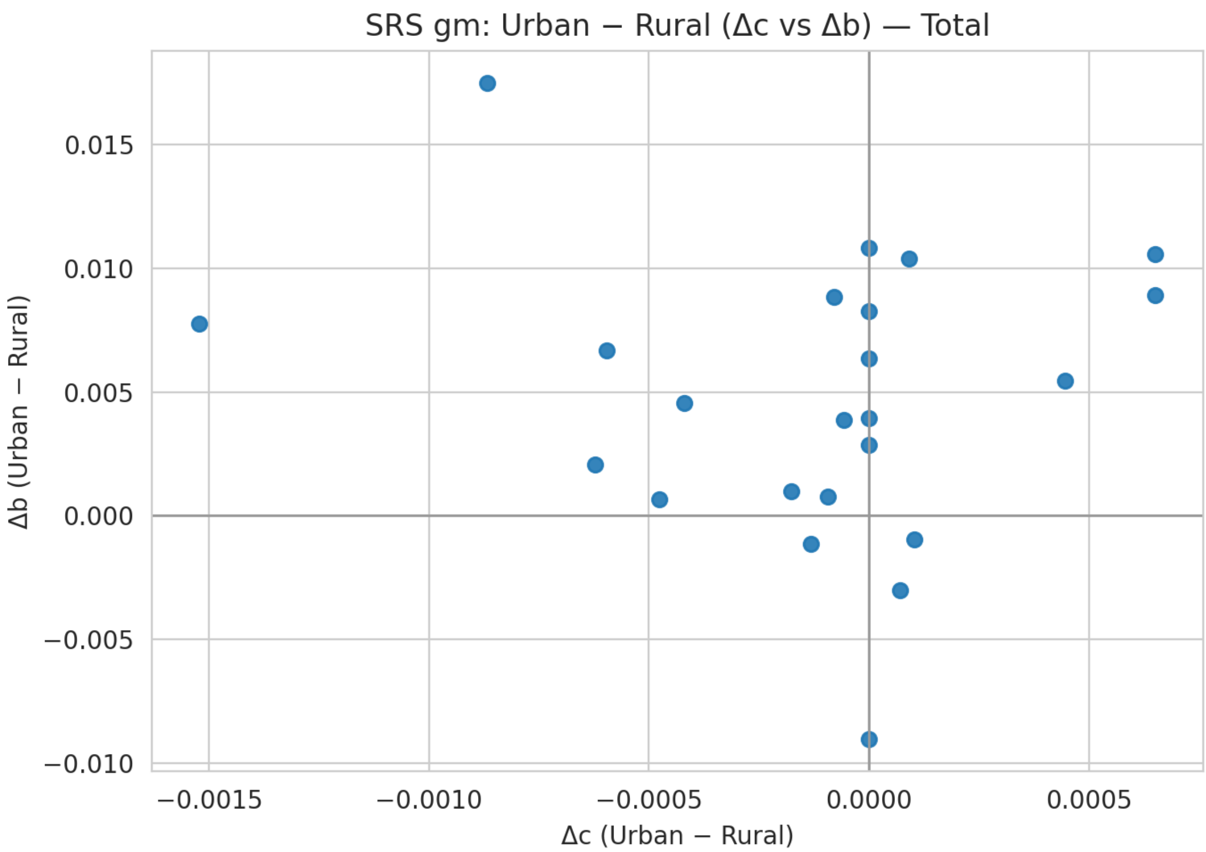

Figure 15: delta_cb_urban_minus_rural_gm_Total

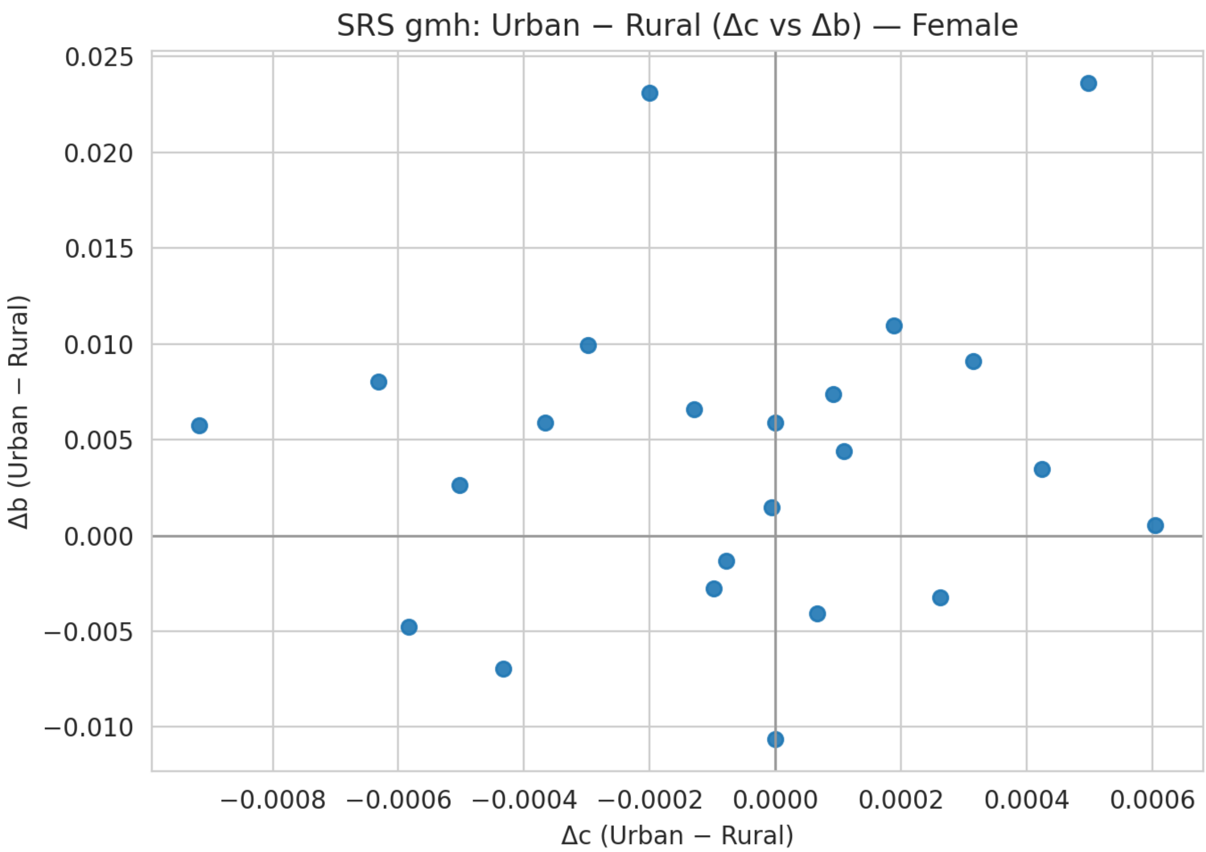

Figure 16: delta_cb_urban_minus_rural_gmh_Female

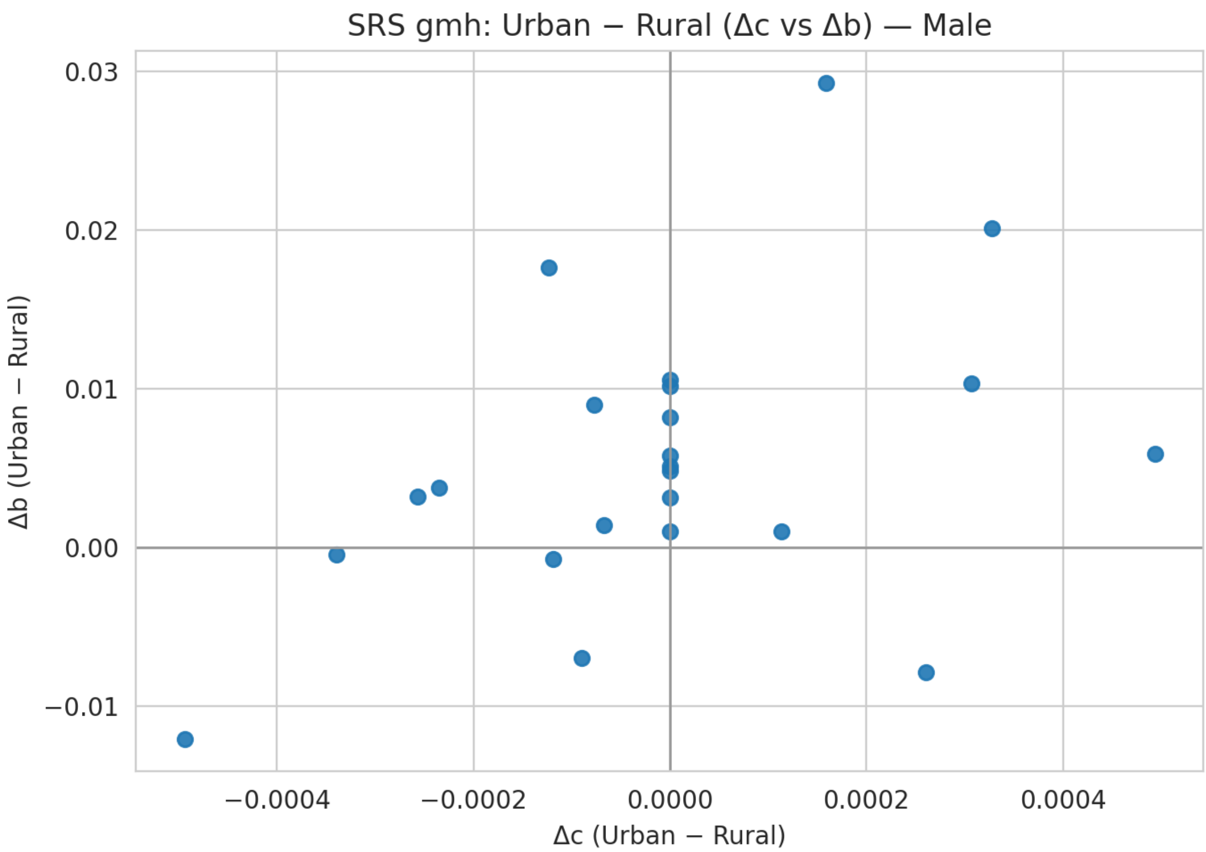

Figure 17: delta_cb_urban_minus_rural_gmh_Male

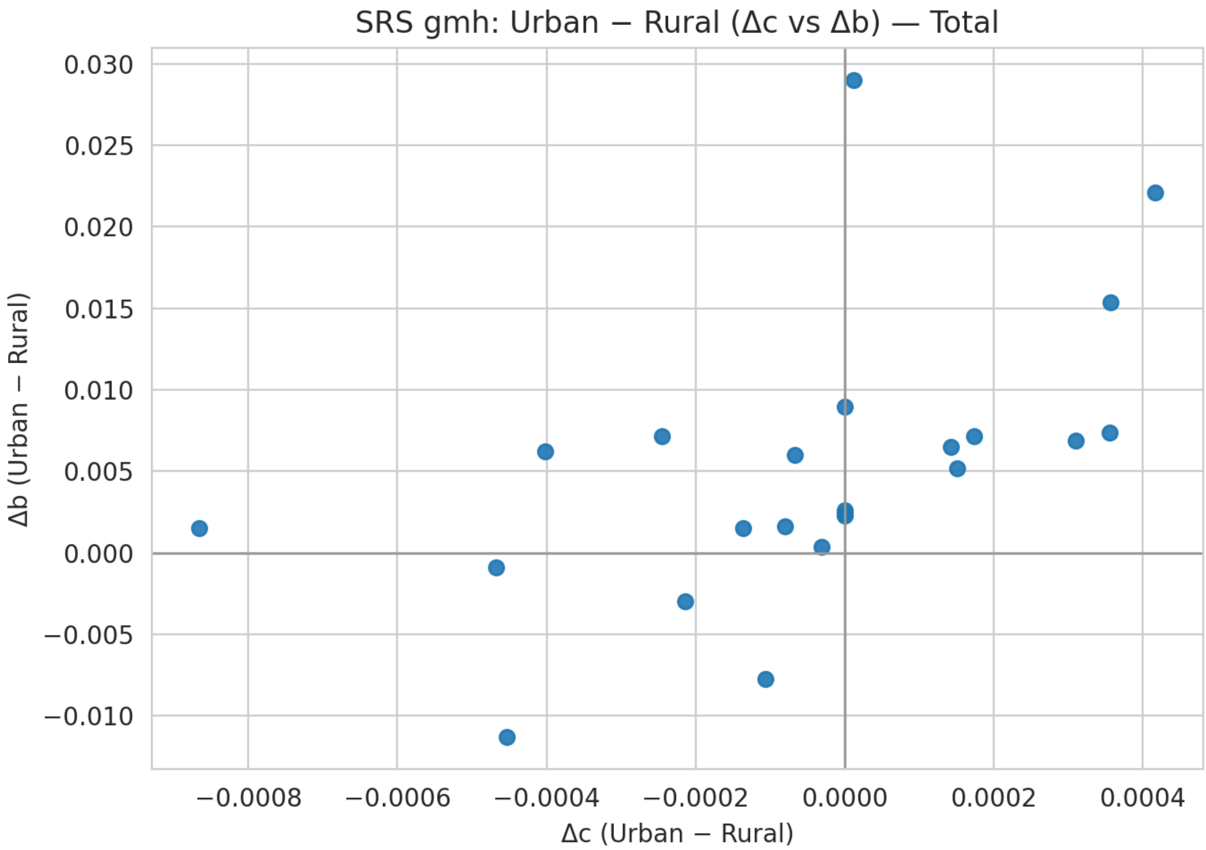

Figure 18: delta_cb_urban_minus_rural_gmh_Total

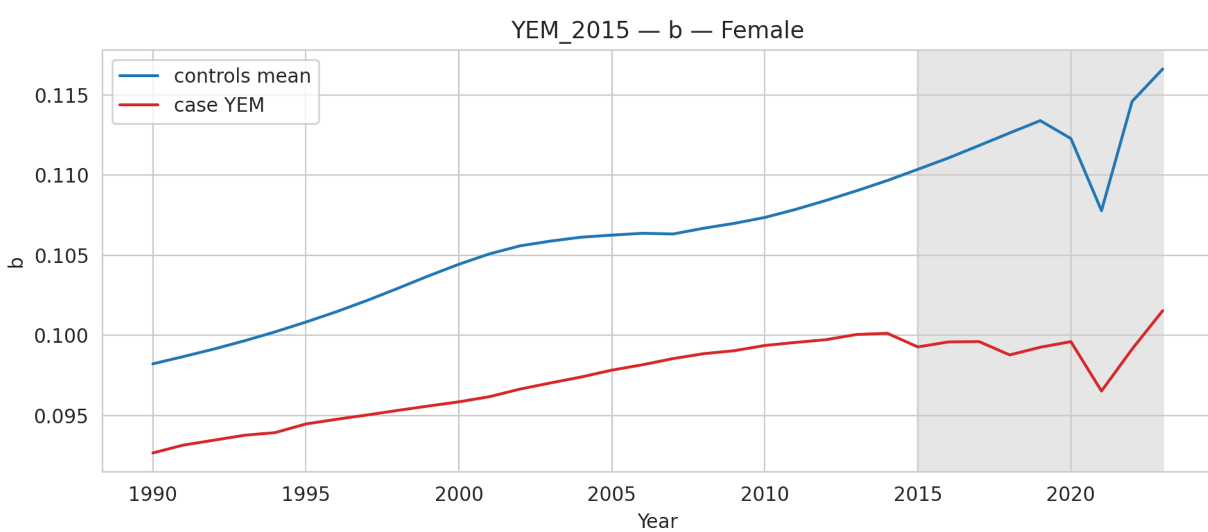

Figure 19: YEM_2015_YEM_Female_timeseries_b

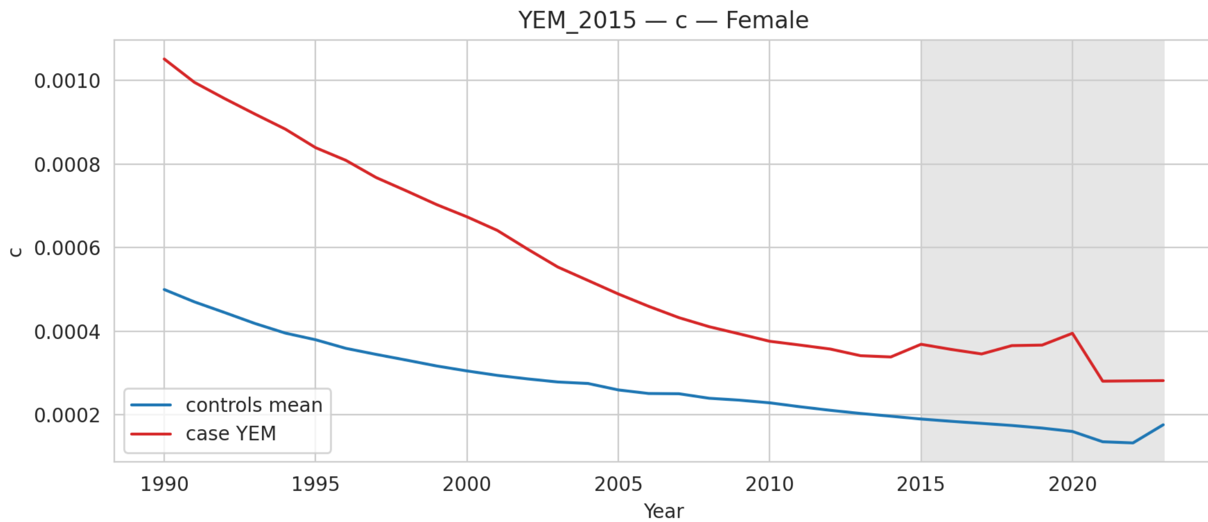

Figure 20: YEM_2015_YEM_Female_timeseries_c

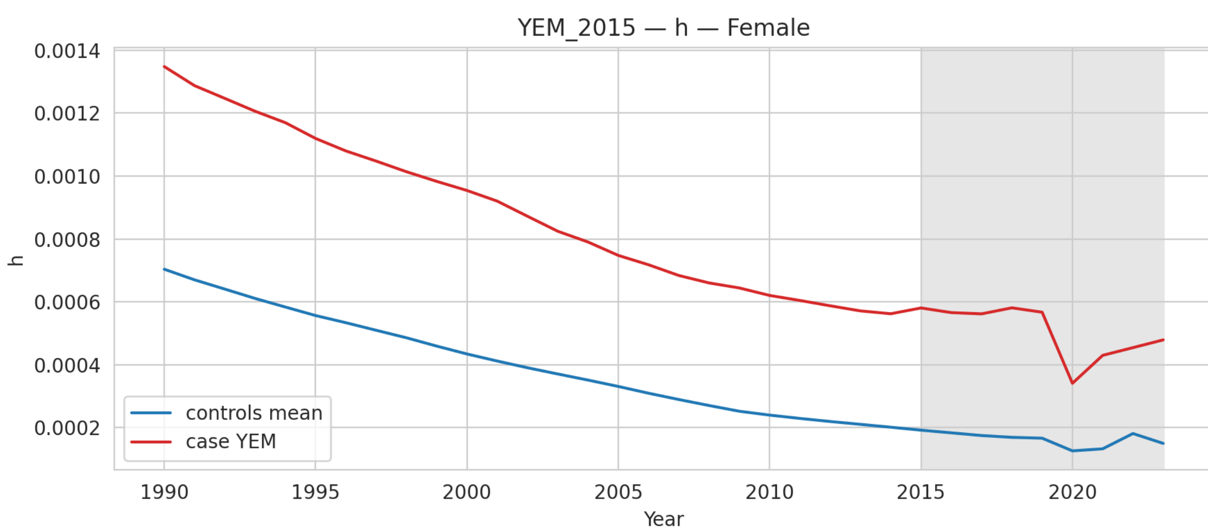

Figure 21: YEM_2015_YEM_Female_timeseries_h

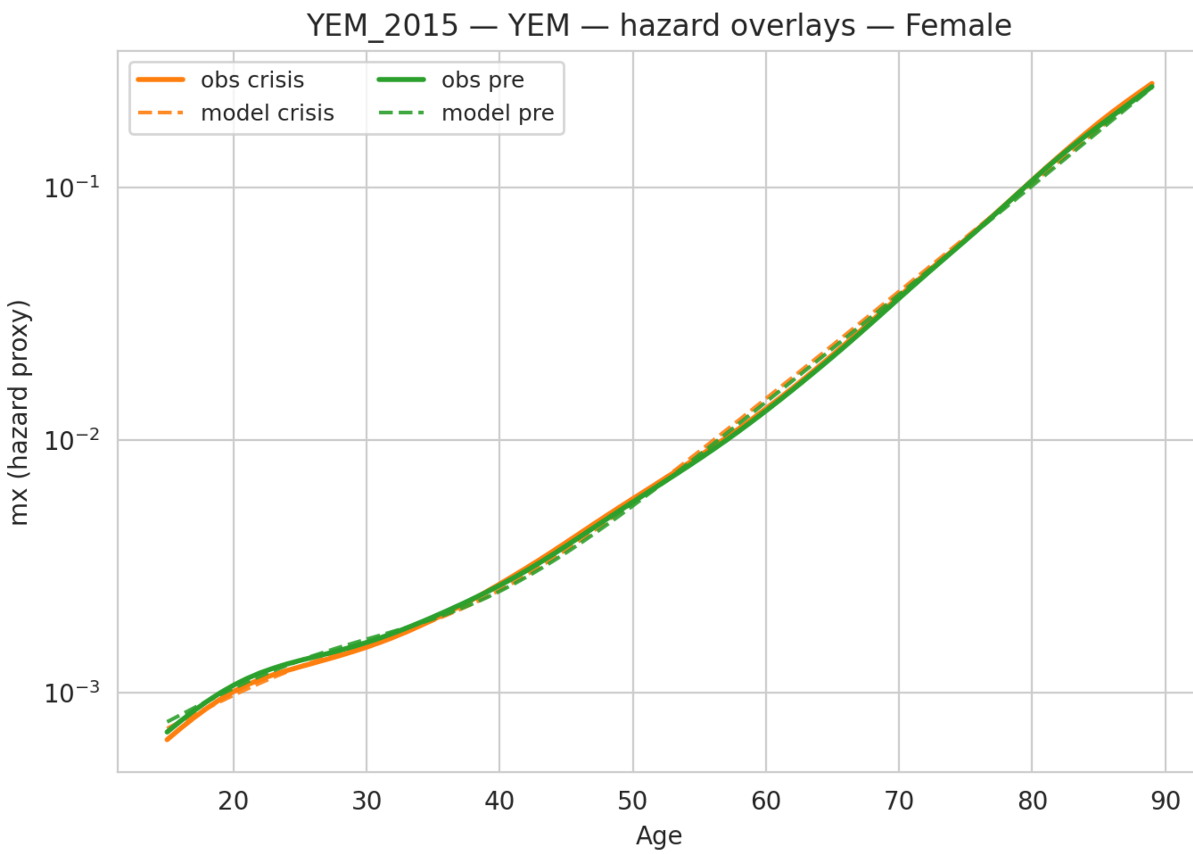

Figure 22: YEM_2015_YEM_Female_hazard_overlays

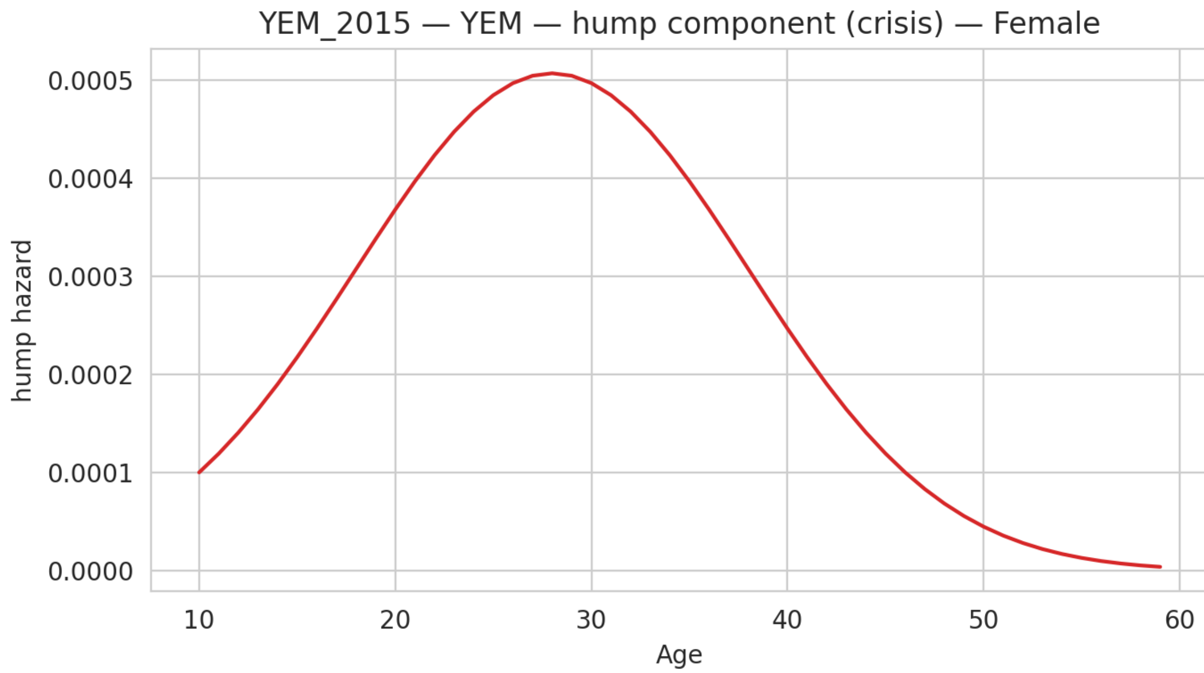

Figure 23: YEM_2015_YEM_Female_hump_component

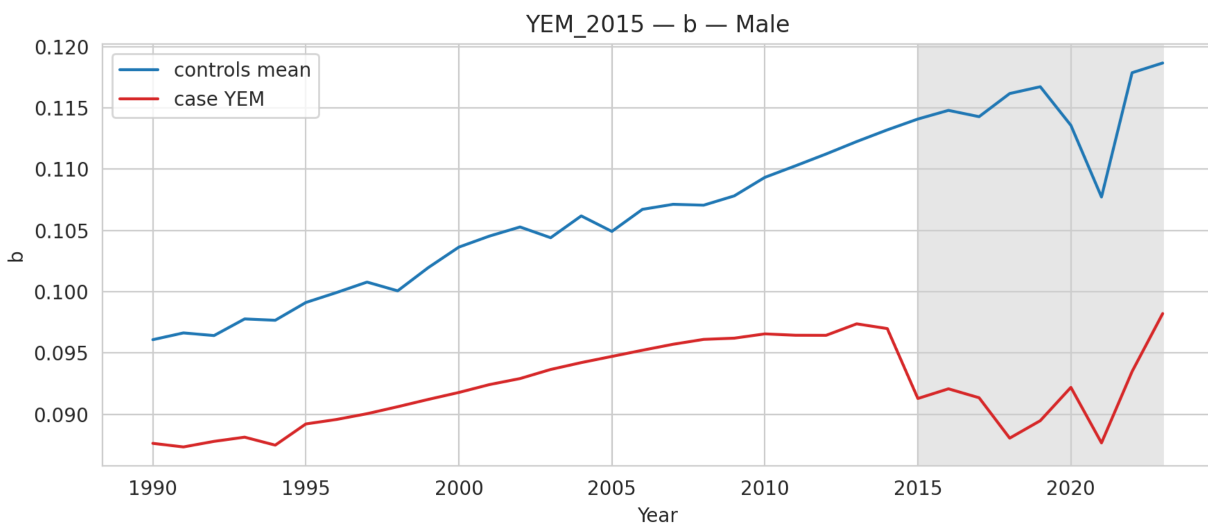

Figure 24: YEM_2015_YEM_Male_timeseries_b

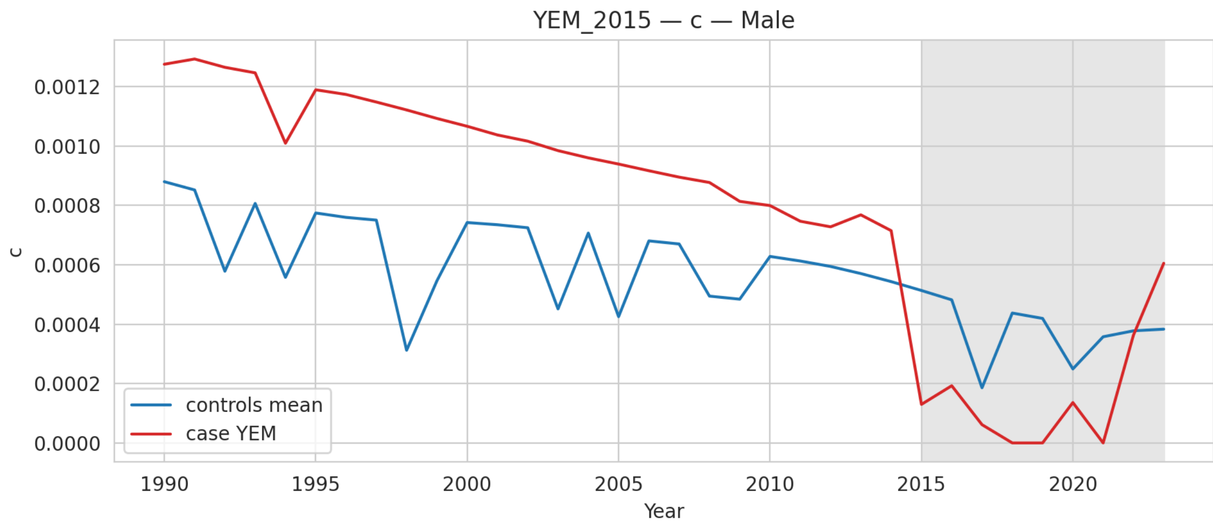

Figure 25: YEM_2015_YEM_Male_timeseries_c

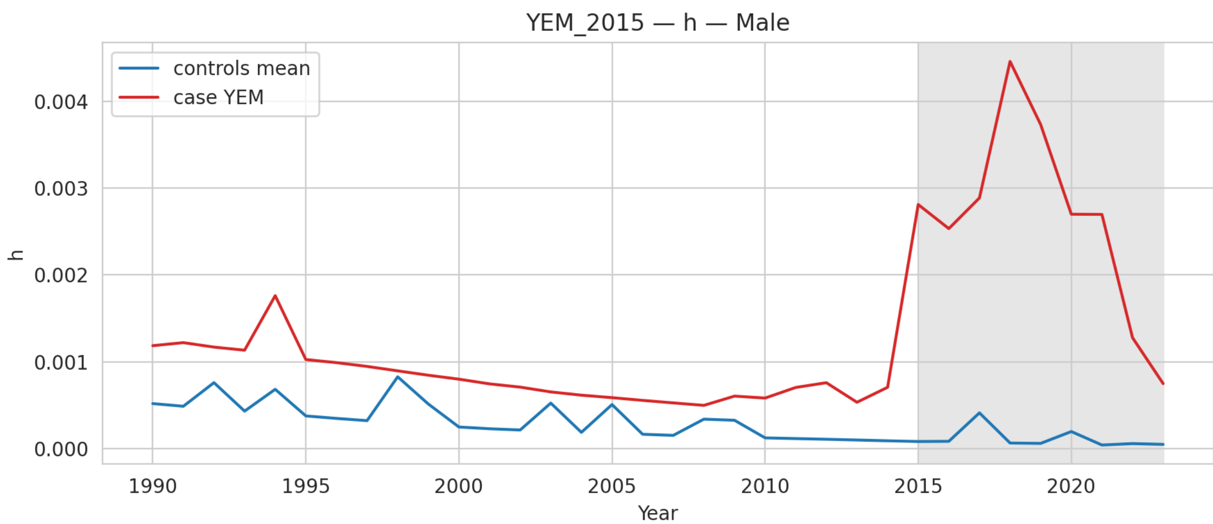

Figure 26: YEM_2015_YEM_Male_timeseries_h

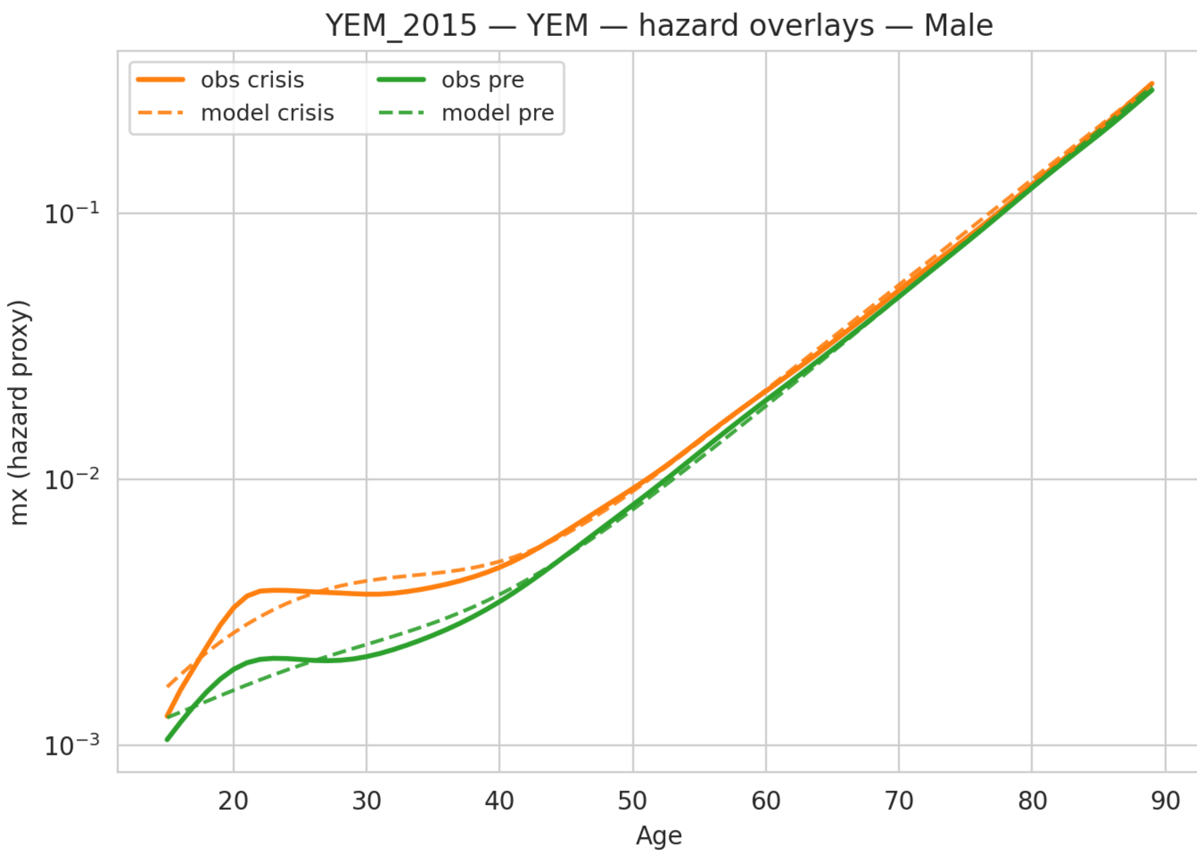

Figure 27: YEM_2015_YEM_Male_hazard_overlays

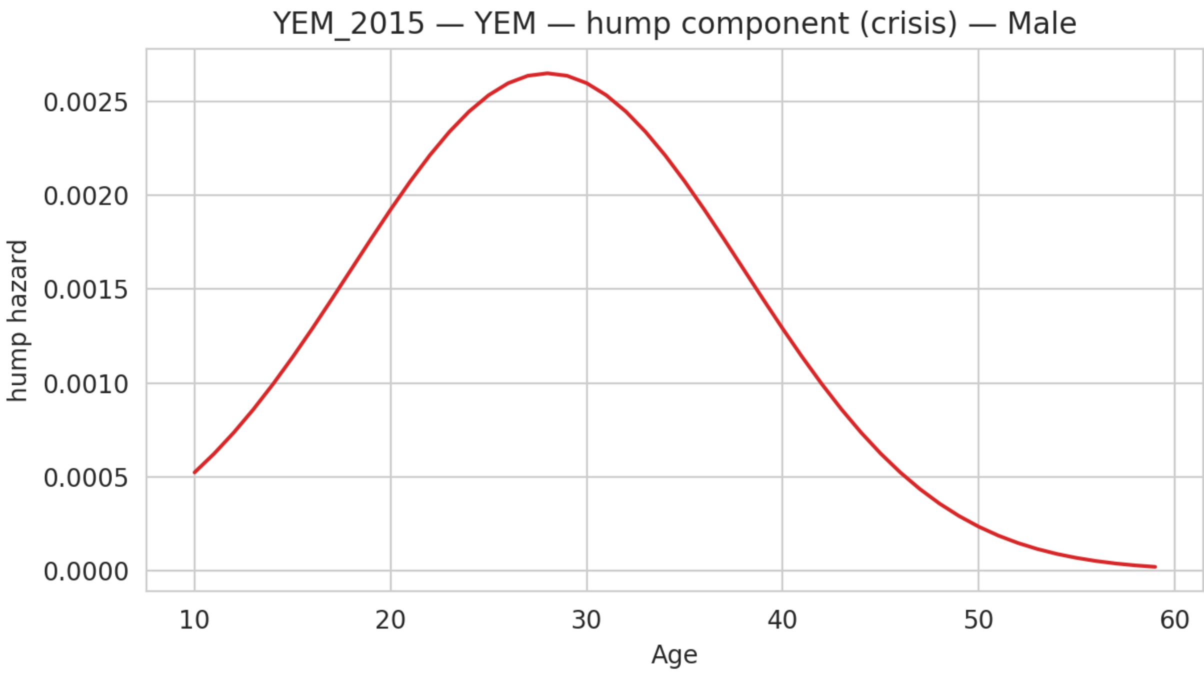

Figure 28: YEM_2015_YEM_Male_hump_component

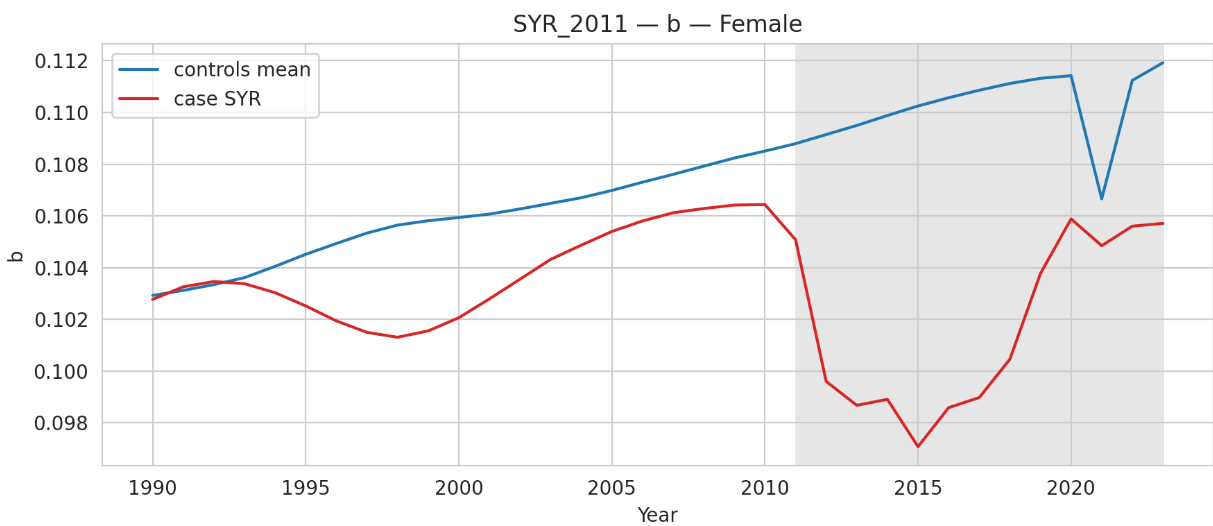

Figure 29: SYR_2011_SYR_Female_timeseries_b

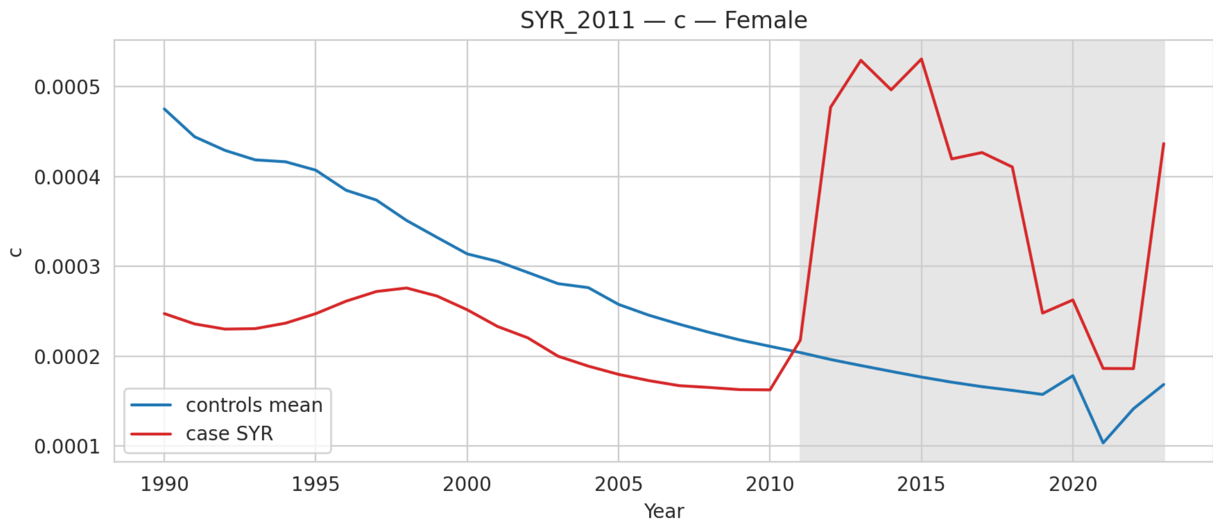

Figure 30: SYR_2011_SYR_Female_timeseries_c

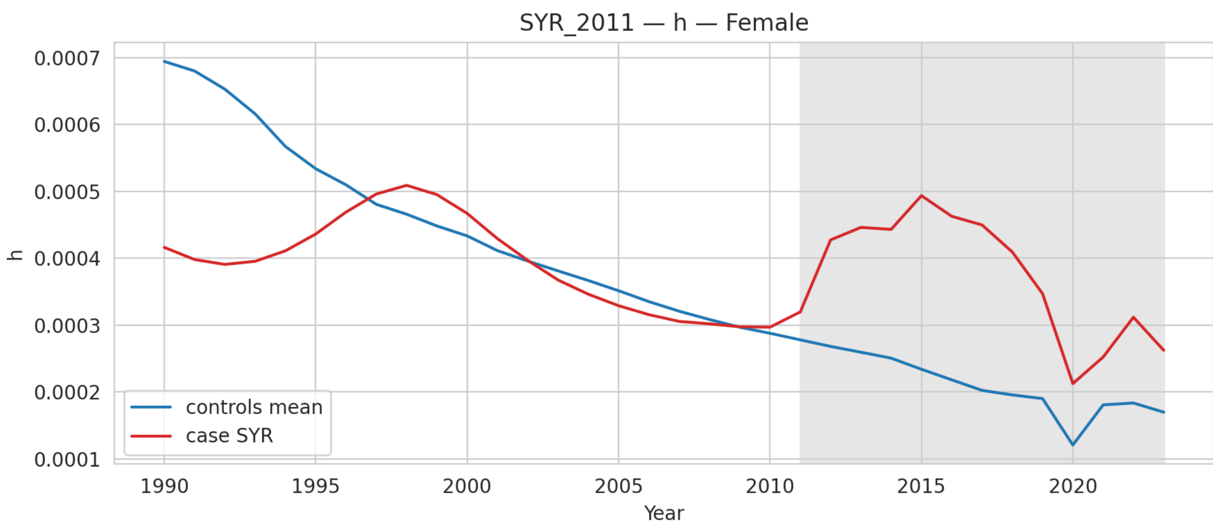

Figure 31: SYR_2011_SYR_Female_timeseries_h

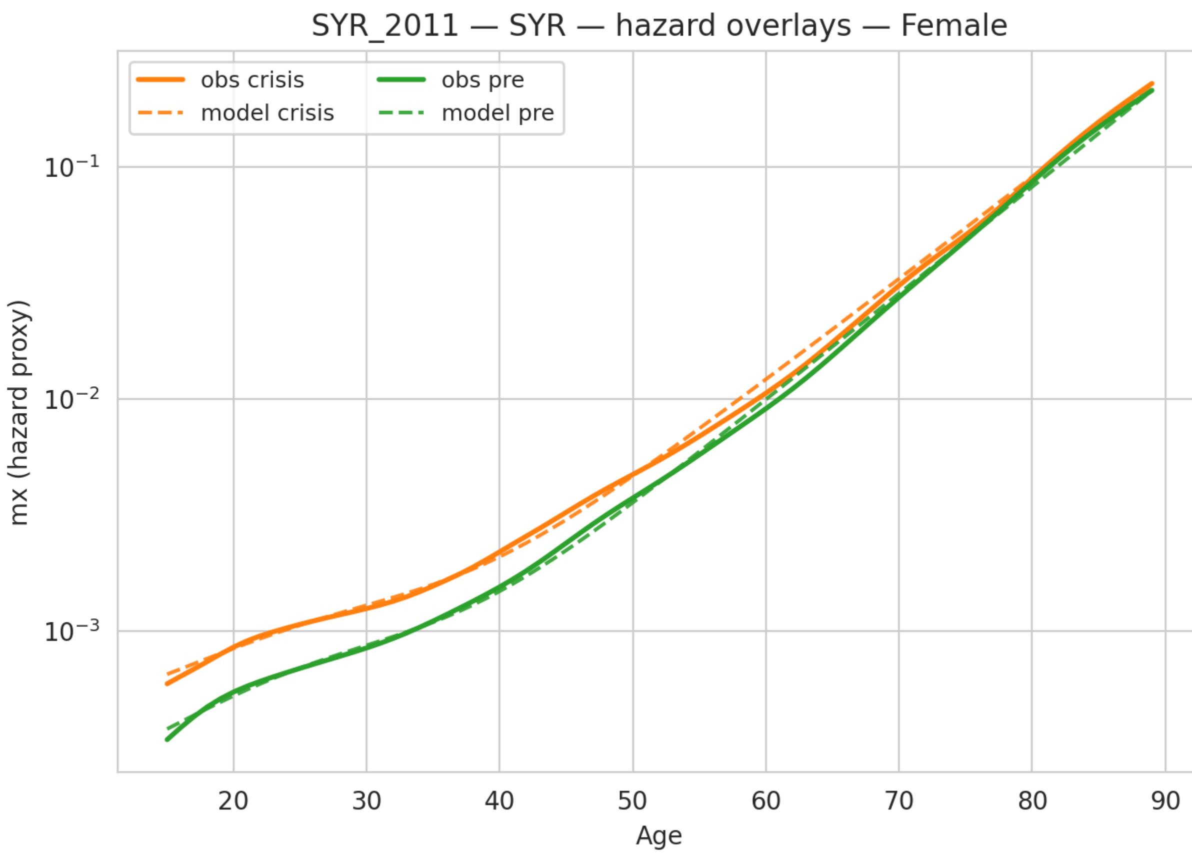

Figure 32: SYR_2011_SYR_Female_hazard_overlays

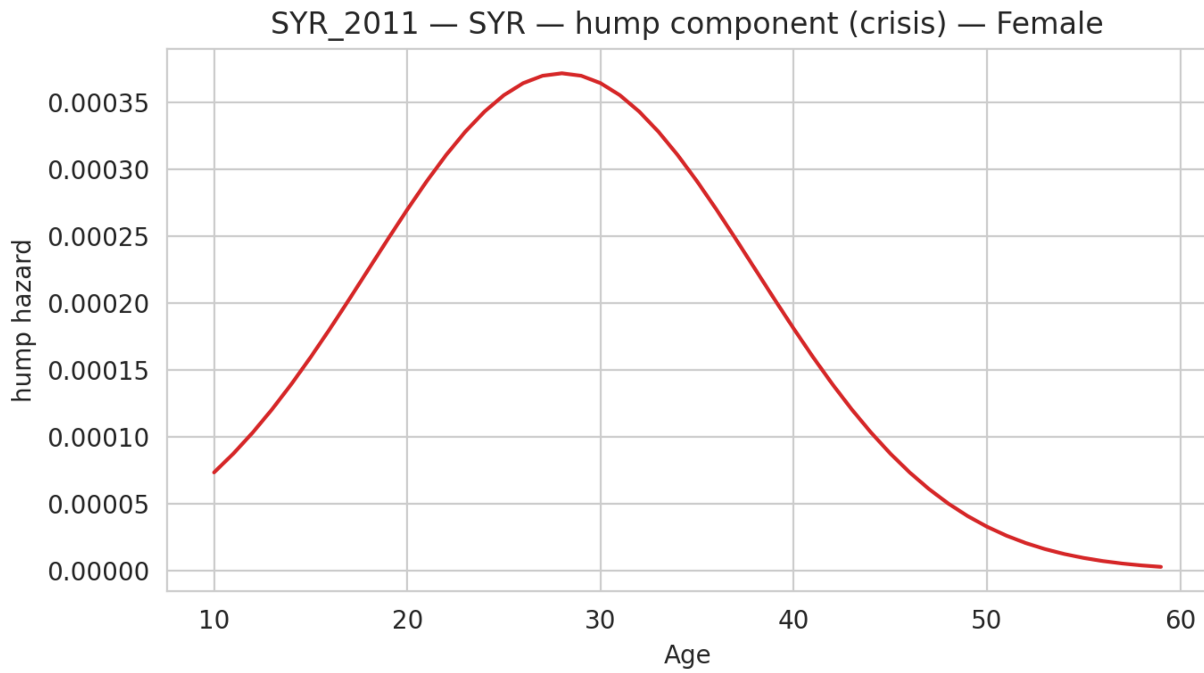

Figure 33: SYR_2011_SYR_Female_hump_component

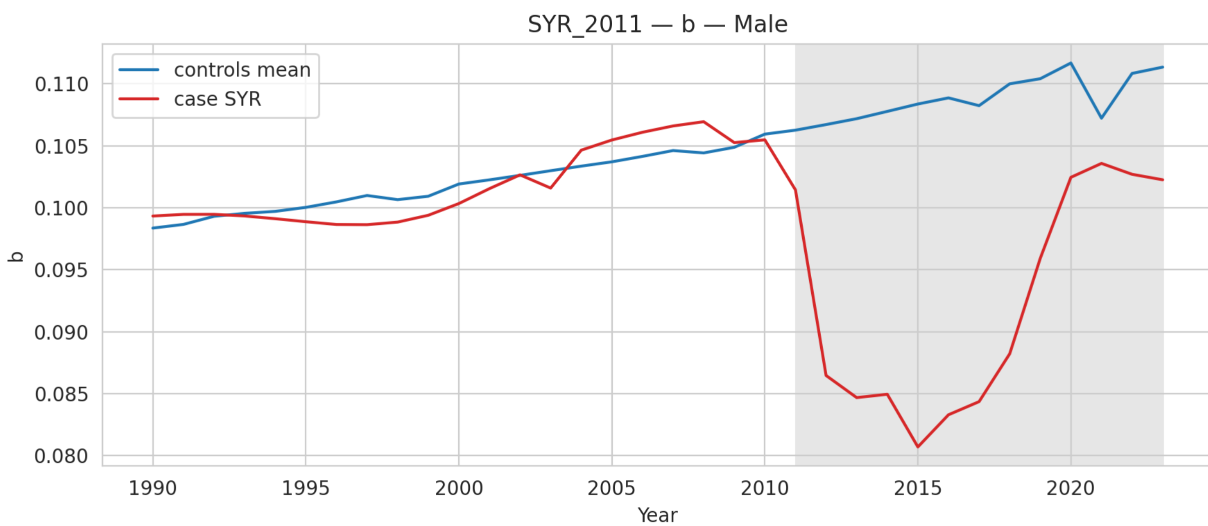

Figure 34: SYR_2011_SYR_Male_timeseries_b

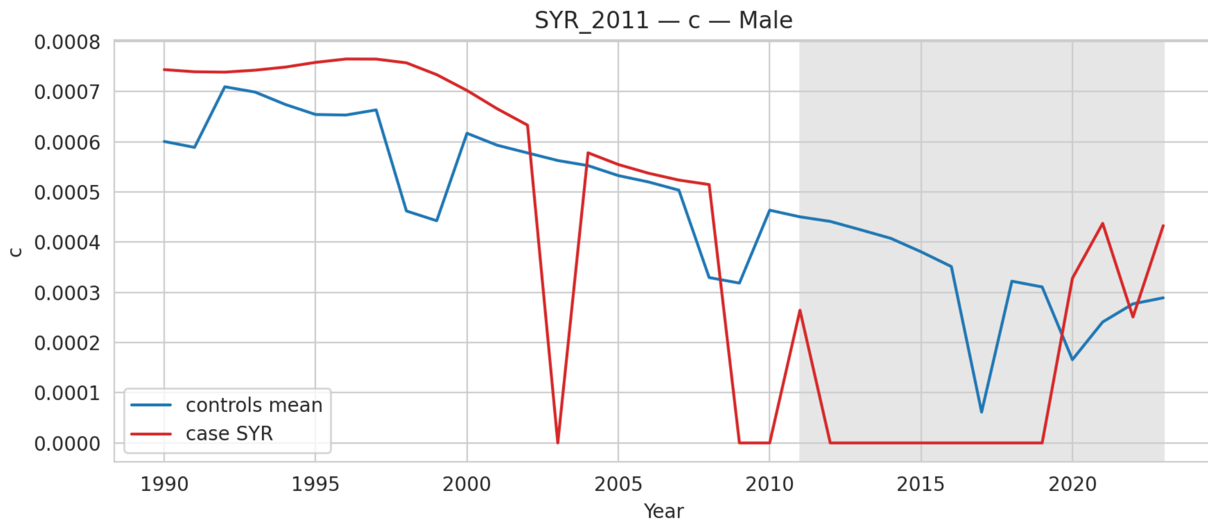

Figure 35: SYR_2011_SYR_Male_timeseries_c

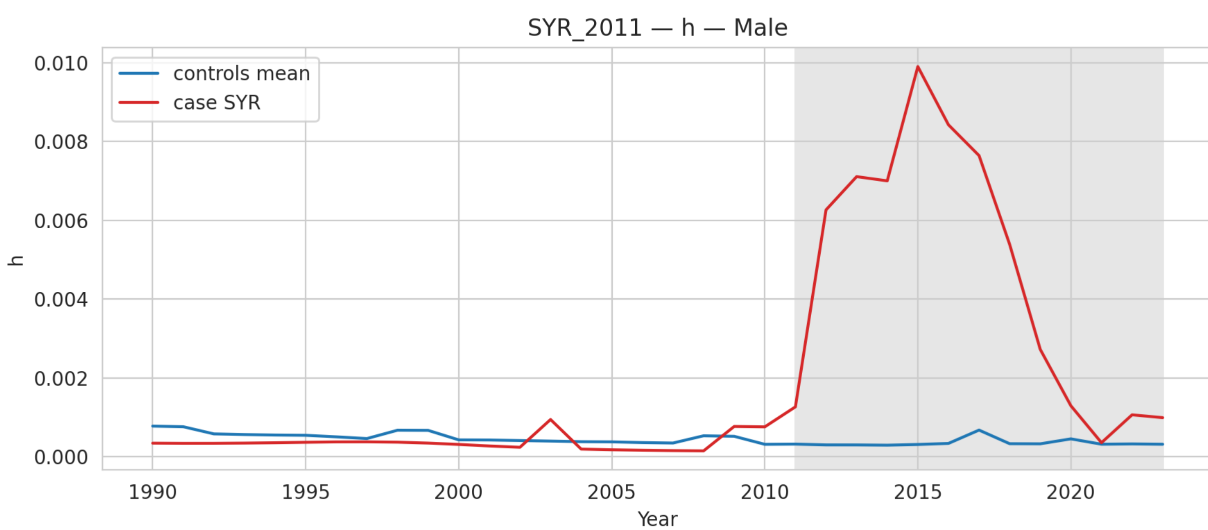

Figure 36: SYR_2011_SYR_Male_timeseries_h

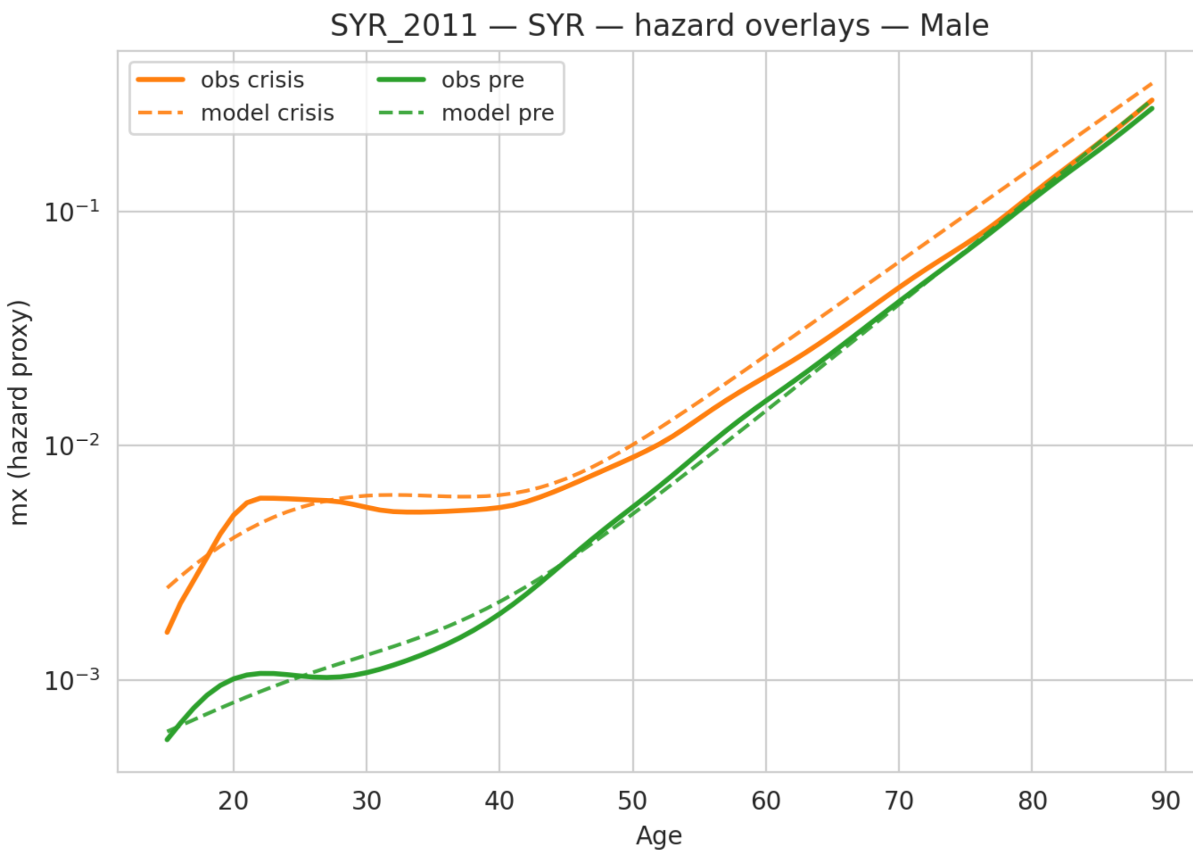

Figure 37: SYR_2011_SYR_Male_hazard_overlays

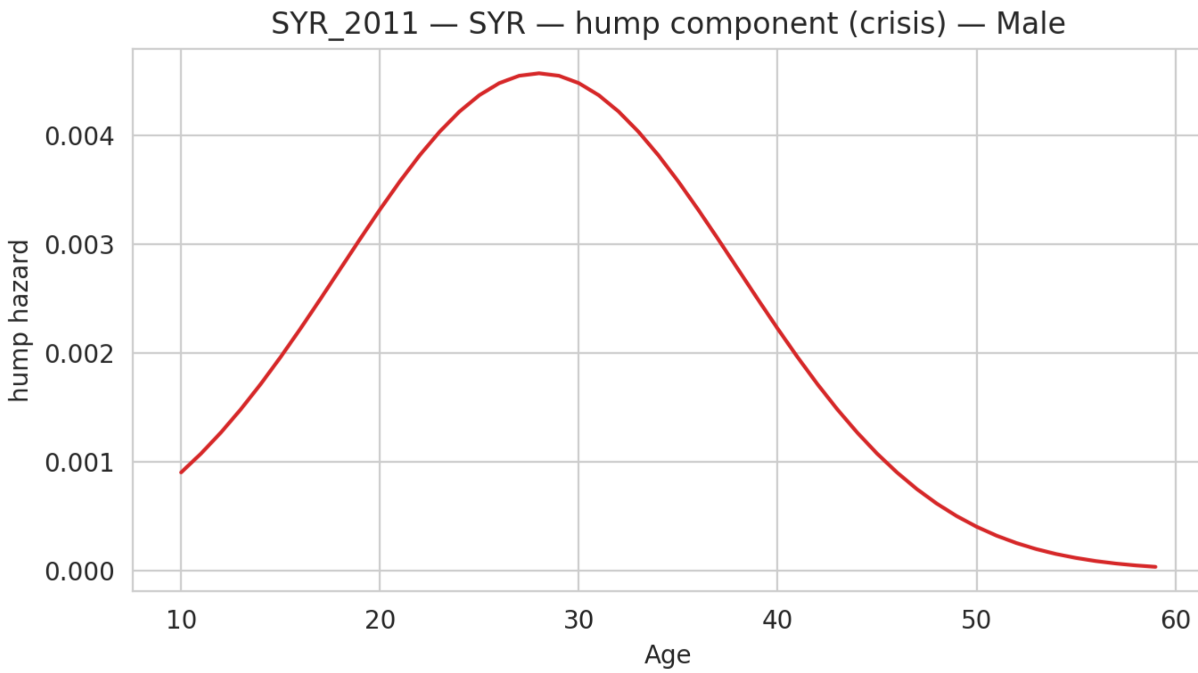

Figure 38: SYR__2011__SYR__Male__hump__component

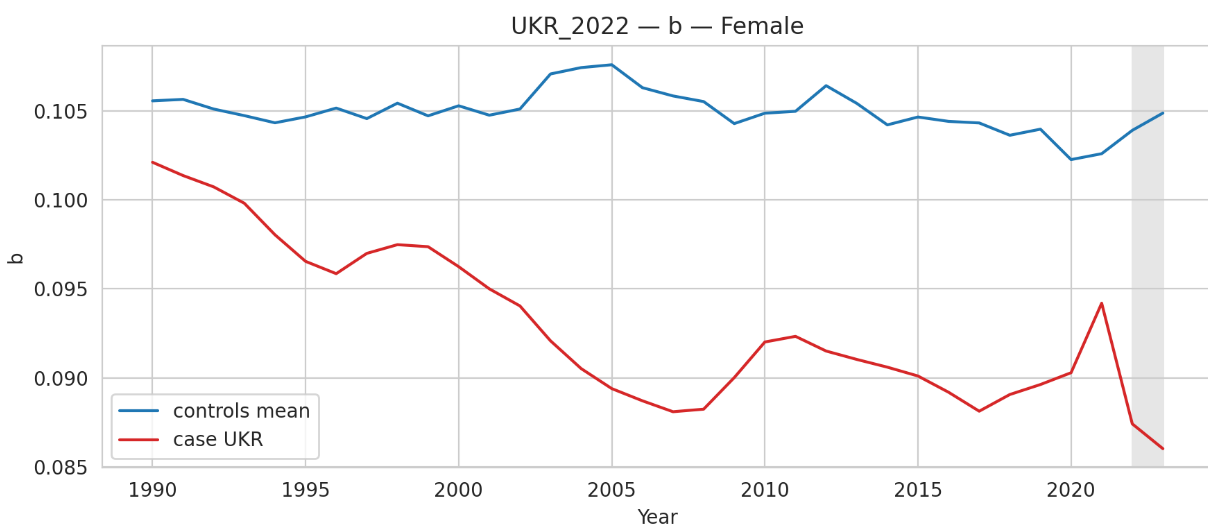

Figure 39: UKR__2022__UKR__Female__timeseries__b

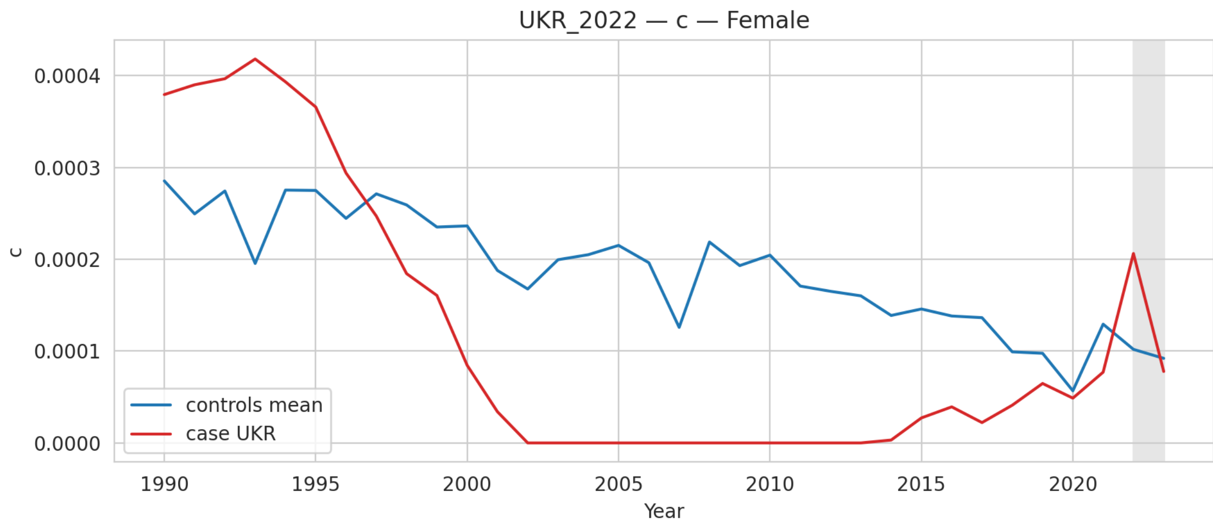

Figure 40: UKR_2022_UKR_Female_timeseries_c

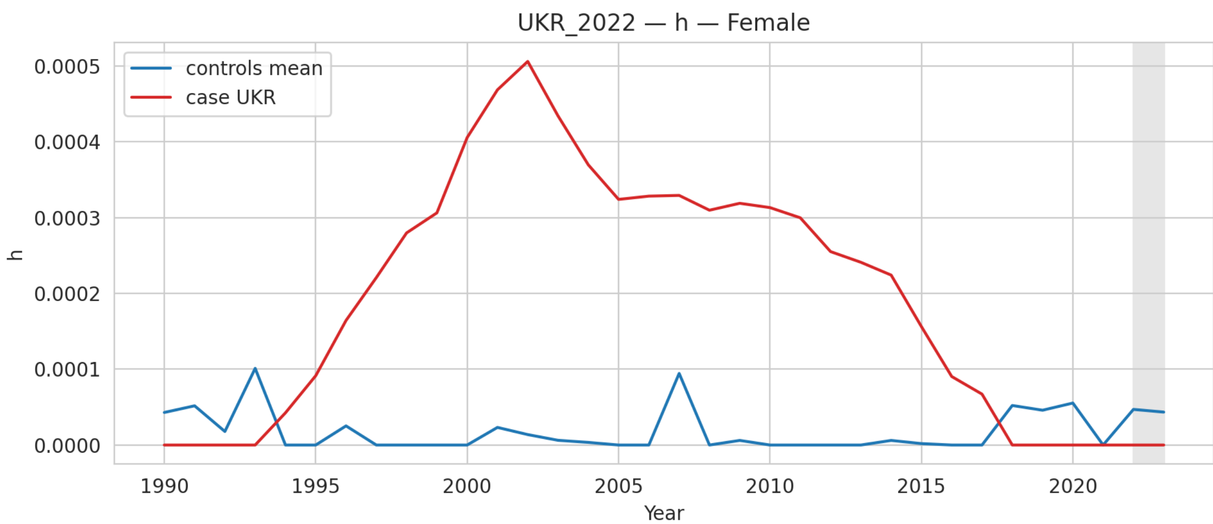

Figure 41: UKR_2022_UKR_Female_timeseries_h

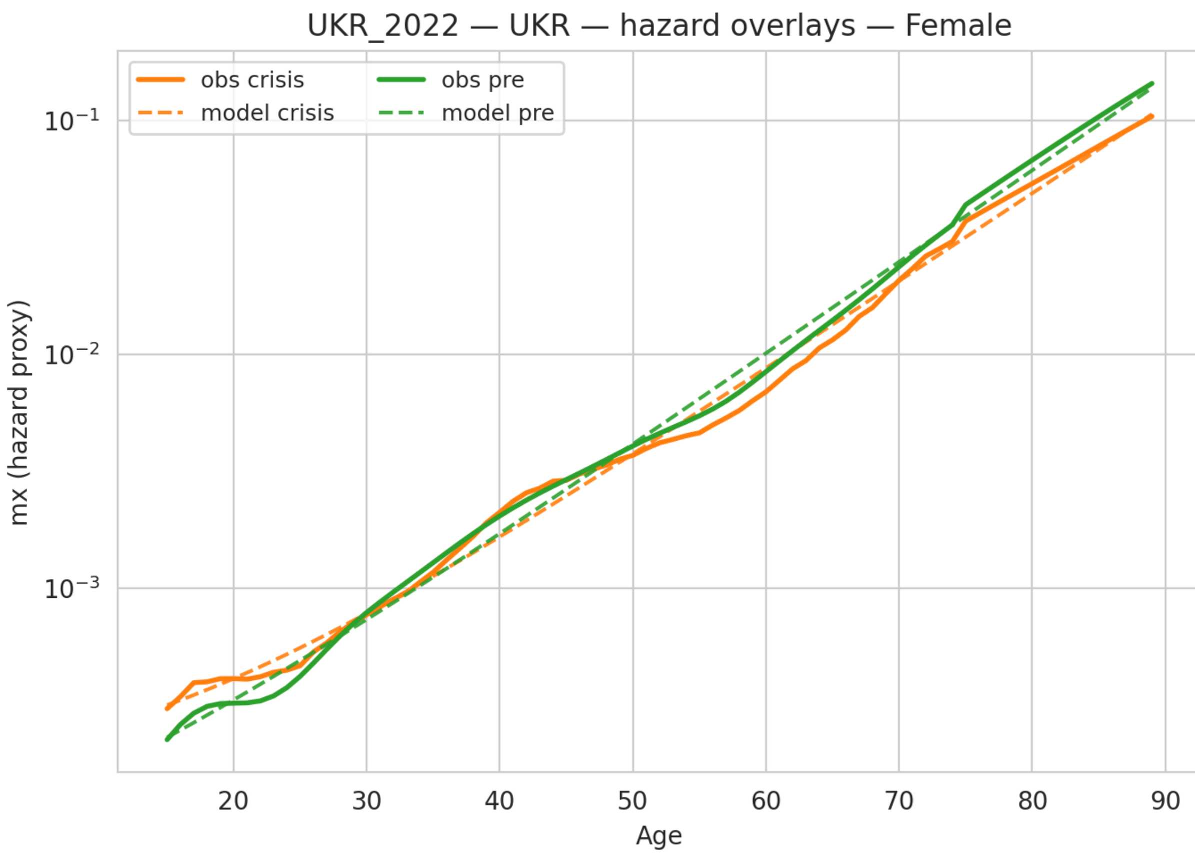

Figure 42: UKR_2022_UKR_Female_hazard_overlays

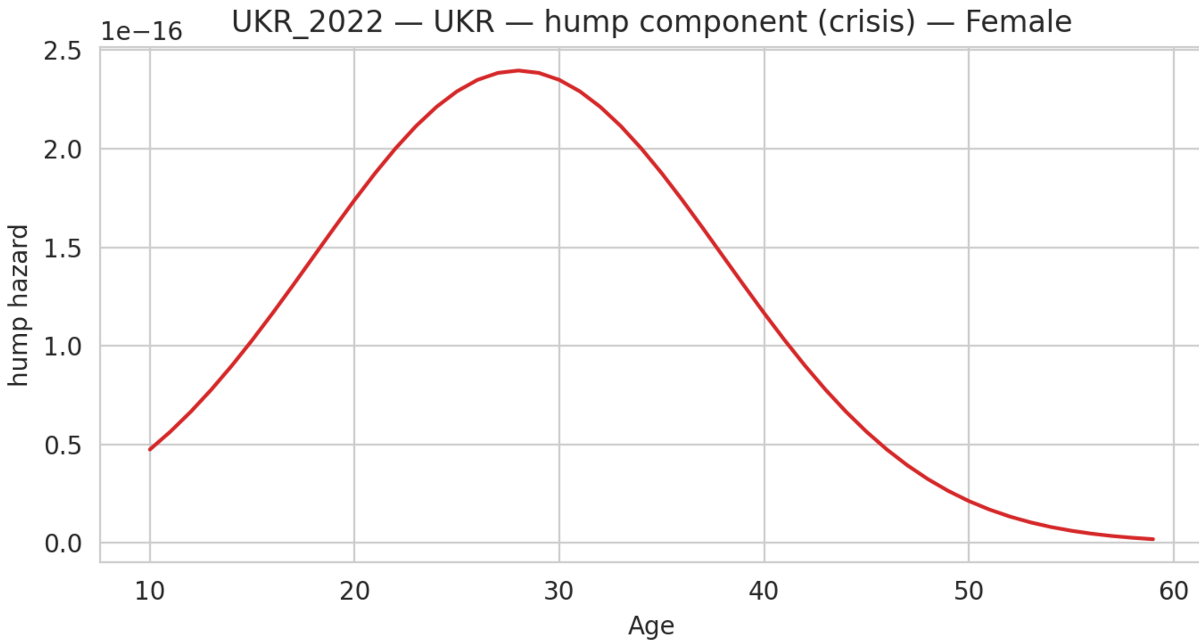

Figure 43: UKR_2022_UKR_Female_hump_component

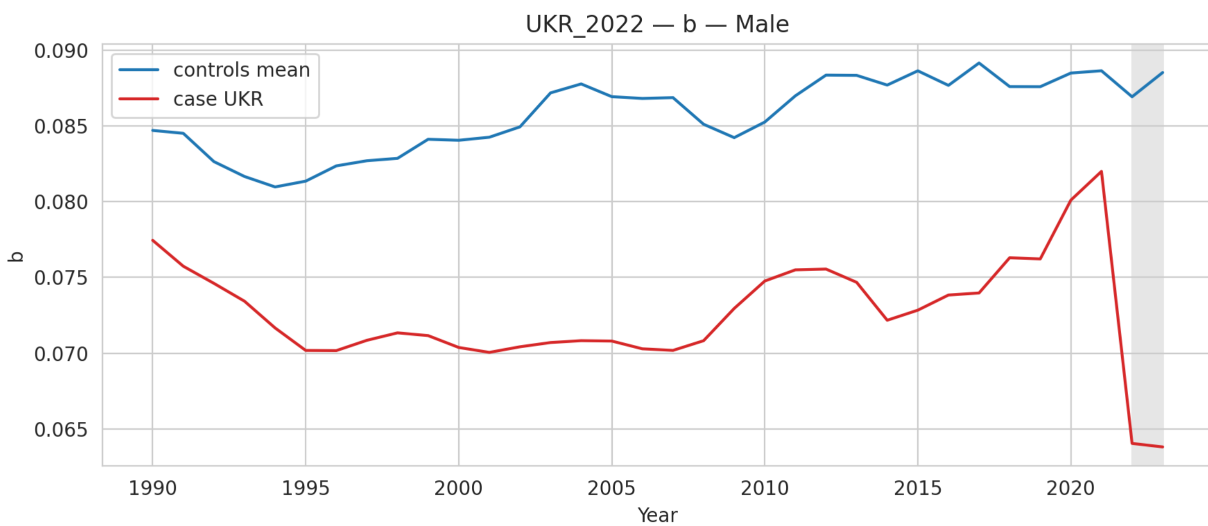

Figure 44: UKR_2022_UKR_Male_timeseries_b

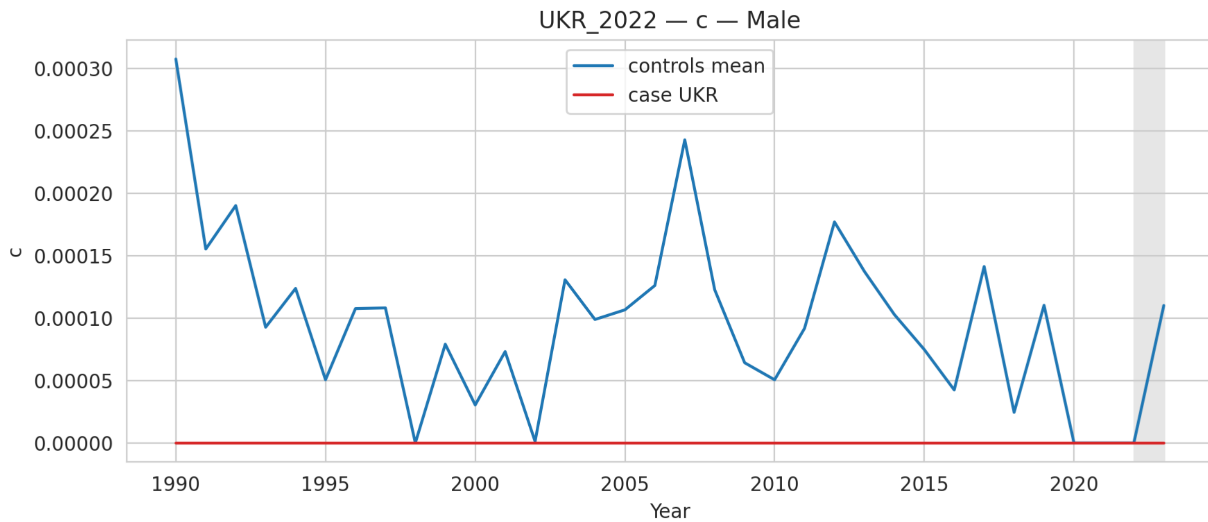

Figure 45: UKR_2022_UKR_Male_timeseries_c

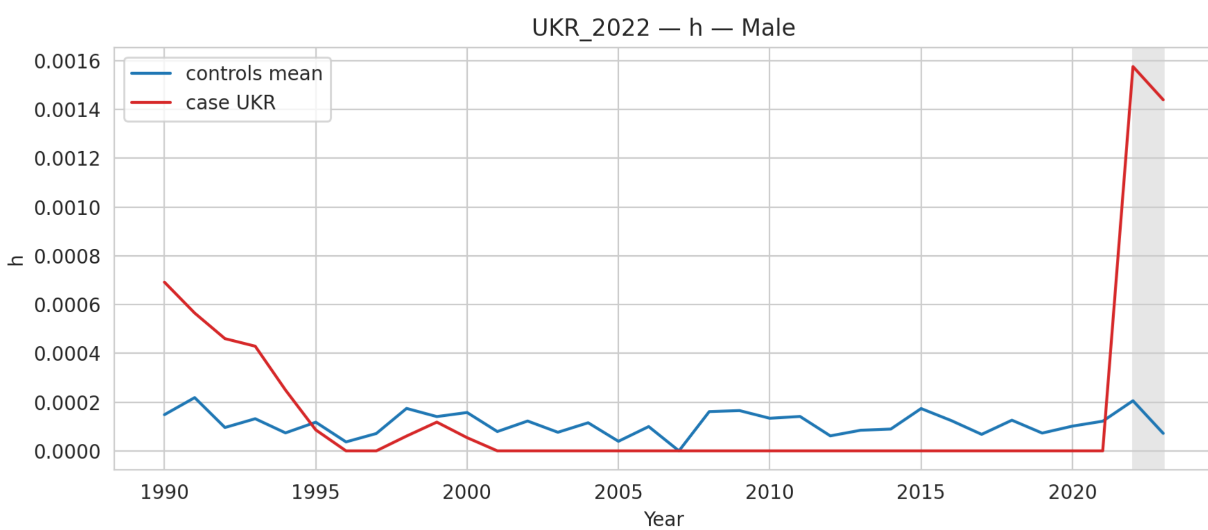

Figure 46: UKR_2022_UKR_Male_timeseries_h

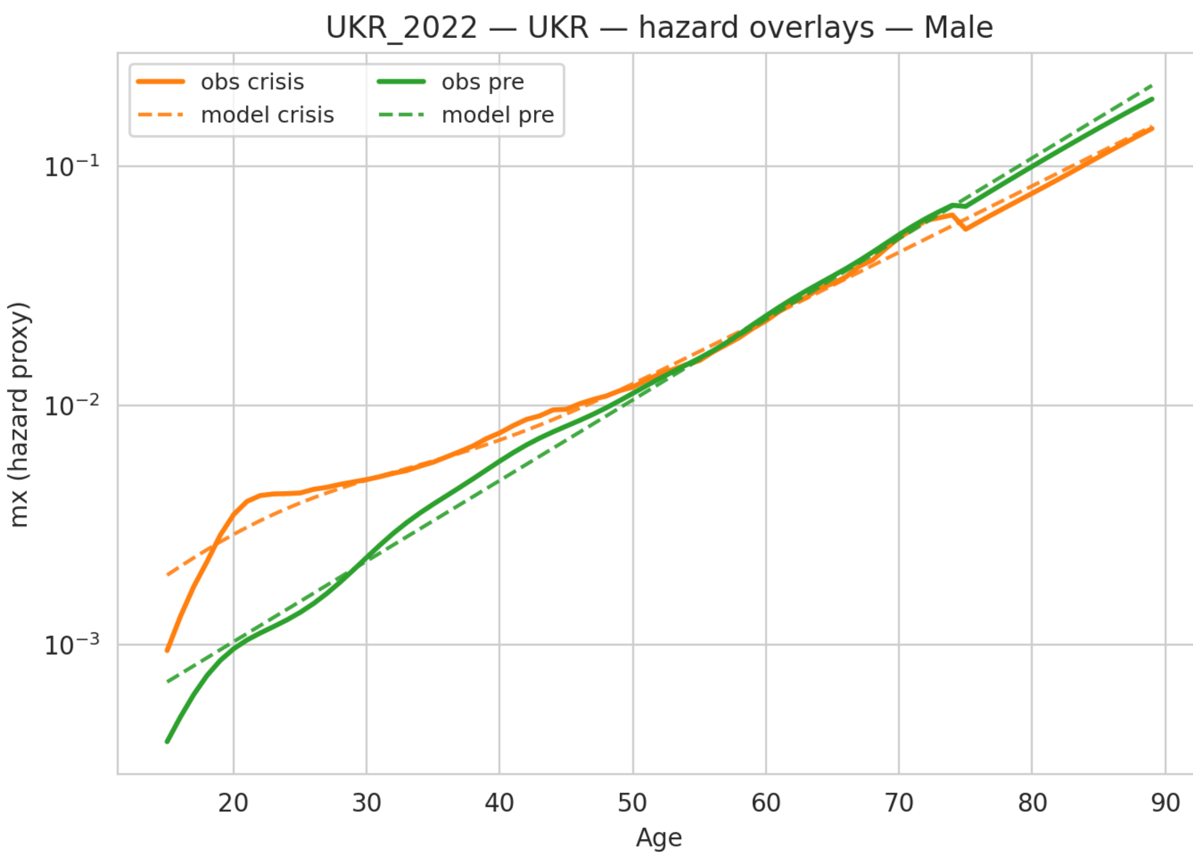

Figure 47: UKR_2022_UKR_Male_hazard_overlays

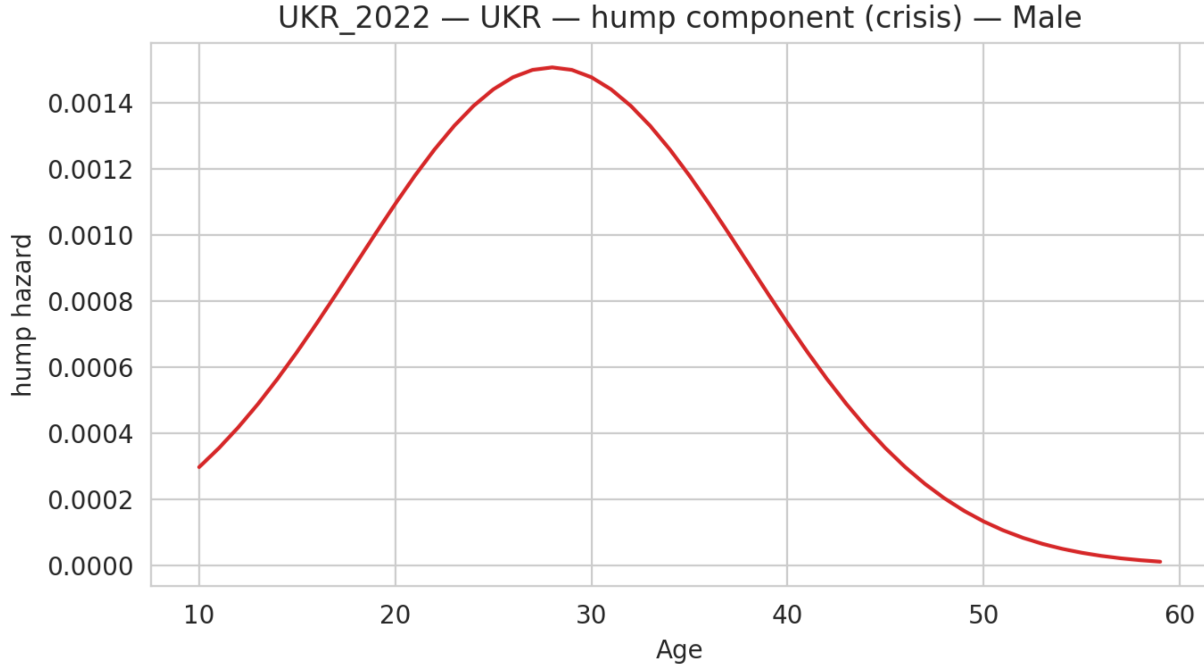

Figure 48: UKR_2022_UKR_Male_hump_component

2.13.3.2 Male

2.14 Regressions

2.14.1 Female

2.14.1.1 Outcome: c

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      c   R-squared:                       0.772
Model:                            OLS   Adj. R-squared:                  0.654
Method:                 Least Squares   F-statistic:                     1.634
Date:                Thu, 05 Feb 2026   Prob (F-statistic):              0.323
Time:                        22:21:29   Log-Likelihood:                 400.40
No. Observations:                  45   AIC:                            -768.8
Df Residuals:                      29   BIC:                            -739.9
Df Model:                          15
Covariance Type:              cluster
============================================================================================
                             coef    std err          z      P>|z|      [0.025      0.975]
--------------------------------------------------------------------------------------------
Intercept               9.418e-05     2.3e-05      4.103      0.000    4.92e-05       0.000
C(iso3)[T.POL]         -5.718e-05    1.35e-05     -4.226      0.000   -8.37e-05   -3.07e-05
C(iso3)[T.ROU]          7.685e-06    1.24e-05      0.619      0.536   -1.66e-05     3.2e-05
C(iso3)[T.TUN]          4.844e-05     2.6e-05      1.862      0.063   -2.55e-06    9.94e-05
C(iso3)[T.UKR]          -9.24e-05    1.51e-05     -6.112      0.000      -0.000   -6.28e-05
C(year)[T.2016]        -9.241e-06    7.51e-06     -1.231      0.218    -2.4e-05    5.47e-06
C(year)[T.2017]        -1.299e-05    1.35e-05     -0.960      0.337   -3.95e-05    1.35e-05
```

```
C(year)[T.2018]        -3.231e-05   2.55e-05     -1.266      0.205   -8.23e-05    1.77e-05
C(year)[T.2019]        -3.339e-05   2.87e-05     -1.162      0.245   -8.97e-05     2.3e-05
C(year)[T.2020]         -6.86e-05   2.04e-05     -3.362      0.001      -0.000   -2.86e-05
C(year)[T.2021]        -4.554e-05   3.11e-05     -1.464      0.143      -0.000    1.54e-05
C(year)[T.2022]        -2.297e-05   4.05e-05     -0.567      0.571      -0.000    5.65e-05
C(year)[T.2023]        -5.257e-05      3e-05     -1.752      0.080      -0.000    6.23e-06
battle_deaths_per_100k -1.563e-05   8.32e-06     -1.879      0.060   -3.19e-05    6.78e-07
pou                     1.237e-05   1.15e-05      1.080      0.280   -1.01e-05    3.48e-05
fies                    2.538e-06    2.4e-06      1.058      0.290   -2.16e-06    7.24e-06
==============================================================================
Omnibus:                        3.085   Durbin-Watson:                   2.165
Prob(Omnibus):                  0.214   Jarque-Bera (JB):                2.312
Skew:                           0.182   Prob(JB):                        0.315
Kurtosis:                       4.049   Cond. No.                         252.
==============================================================================

Notes:
[1] Standard Errors are robust to cluster correlation (cluster)
```

Coefficients CSV: `reports/tables/regression_c_Female_coef.csv`

2.14.1.2 Outcome: `b`

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      b   R-squared:                       0.969
Model:                            OLS   Adj. R-squared:                  0.952
Method:                 Least Squares   F-statistic:                     56.23
Date:                Thu, 05 Feb 2026   Prob (F-statistic):           0.000905
Time:                        22:21:29   Log-Likelihood:                 228.45
No. Observations:                  45   AIC:                            -424.9
Df Residuals:                      29   BIC:                            -396.0
Df Model:                          15
Covariance Type:              cluster
==========================================================================================
                             coef    std err          z      P>|z|      [0.025      0.975]
------------------------------------------------------------------------------------------
Intercept                  0.1042      0.001     96.866      0.000       0.102       0.106
C(iso3)[T.POL]             0.0011      0.001      1.014      0.311      -0.001       0.003
C(iso3)[T.ROU]             0.0034      0.001      4.535      0.000       0.002       0.005
C(iso3)[T.TUN]             0.0147      0.002      7.786      0.000       0.011       0.018
C(iso3)[T.UKR]            -0.0117      0.001     -8.381      0.000      -0.014      -0.009
C(year)[T.2016]           -0.0004      0.000     -1.360      0.174      -0.001       0.000
C(year)[T.2017]           -0.0008      0.001     -1.268      0.205      -0.002       0.000
C(year)[T.2018]           -0.0011      0.001     -2.167      0.030      -0.002      -0.000
C(year)[T.2019]           -0.0007      0.001     -1.205      0.228      -0.002       0.000
C(year)[T.2020]           -0.0013      0.001     -1.228      0.220      -0.003       0.001
C(year)[T.2021]           -0.0015      0.002     -0.665      0.506      -0.006       0.003
C(year)[T.2022]           -0.0010      0.001     -1.947      0.052      -0.002    6.76e-06
C(year)[T.2023]           -0.0008      0.001     -0.702      0.483      -0.003       0.001
battle_deaths_per_100k -3.563e-05      0.000     -0.273      0.785      -0.000       0.000
pou                        0.0002      0.001      0.436      0.662      -0.001       0.001
fies                      -0.0001      0.000     -0.753      0.452      -0.000       0.000
==============================================================================
Omnibus:                       15.104   Durbin-Watson:                   1.855
```

```
Prob(Omnibus):                  0.001   Jarque-Bera (JB):               42.831
Skew:                           0.603   Prob(JB):                     5.00e-10
Kurtosis:                       7.625   Cond. No.                         252.
==============================================================================

Notes:
[1] Standard Errors are robust to cluster correlation (cluster)
```

Coefficients CSV: `reports/tables/regression_b_Female_coef.csv`

2.14.1.3 Outcome: `h`

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      h   R-squared:                       0.684
Model:                            OLS   Adj. R-squared:                  0.520
Method:                 Least Squares   F-statistic:                     5.096
Date:                Thu, 05 Feb 2026   Prob (F-statistic):             0.0719
Time:                        22:21:29   Log-Likelihood:                 401.28
No. Observations:                  45   AIC:                            -770.6
Df Residuals:                      29   BIC:                            -741.7
Df Model:                          15
Covariance Type:              cluster
==========================================================================================
                             coef    std err          z      P>|z|      [0.025      0.975]
------------------------------------------------------------------------------------------
Intercept              -1.336e-05   2.34e-05     -0.570      0.569   -5.93e-05    3.26e-05
C(iso3)[T.POL]          7.005e-05   2.19e-05      3.199      0.001    2.71e-05       0.000
C(iso3)[T.ROU]          8.867e-07   2.07e-05      0.043      0.966   -3.97e-05    4.15e-05
C(iso3)[T.TUN]             0.0001   4.45e-05      2.259      0.024    1.33e-05       0.000
C(iso3)[T.UKR]         -1.142e-05   1.55e-05     -0.735      0.462   -4.19e-05     1.9e-05
C(year)[T.2016]         6.619e-06   2.05e-05      0.322      0.747   -3.36e-05    4.69e-05
C(year)[T.2017]         9.166e-06   1.99e-05      0.460      0.646   -2.99e-05    4.82e-05
C(year)[T.2018]         3.157e-05   4.57e-05      0.690      0.490   -5.81e-05       0.000
C(year)[T.2019]         2.733e-05    4.3e-05      0.636      0.525   -5.69e-05       0.000
C(year)[T.2020]         3.478e-05   4.92e-05      0.707      0.480   -6.16e-05       0.000
C(year)[T.2021]         1.904e-05   2.24e-05      0.851      0.395   -2.48e-05    6.29e-05
C(year)[T.2022]         3.901e-05   4.91e-05      0.795      0.427   -5.72e-05       0.000
C(year)[T.2023]         3.531e-05   4.32e-05      0.818      0.414   -4.93e-05       0.000
battle_deaths_per_100k  5.173e-05   1.52e-05      3.400      0.001    2.19e-05    8.15e-05
pou                     2.243e-06   1.71e-05      0.131      0.896   -3.12e-05    3.57e-05
fies                   -9.637e-07   4.14e-06     -0.233      0.816   -9.07e-06    7.14e-06
==============================================================================
Omnibus:                        0.386   Durbin-Watson:                   1.730
Prob(Omnibus):                  0.824   Jarque-Bera (JB):                0.074
Skew:                           0.092   Prob(JB):                        0.964
Kurtosis:                       3.074   Cond. No.                         252.
==============================================================================

Notes:
[1] Standard Errors are robust to cluster correlation (cluster)
```

Coefficients CSV: `reports/tables/regression_h_Female_coef.csv`

2.14.2 Male

2.14.2.1 Outcome: c

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      c   R-squared:                       0.660
Model:                            OLS   Adj. R-squared:                  0.484
Method:                 Least Squares   F-statistic:                     14.30
Date:                Thu, 05 Feb 2026   Prob (F-statistic):             0.0123
Time:                        22:21:29   Log-Likelihood:                 379.74
No. Observations:                  45   AIC:                            -727.5
Df Residuals:                      29   BIC:                            -698.6
Df Model:                          15
Covariance Type:              cluster
==========================================================================================
                            coef    std err          z      P>|z|      [0.025      0.975]
------------------------------------------------------------------------------------------
Intercept                 0.0001   3.94e-05      3.613      0.000    6.51e-05       0.000
C(iso3)[T.POL]         -8.88e-05   3.38e-05     -2.629      0.009      -0.000   -2.26e-05
C(iso3)[T.ROU]         1.051e-05   2.32e-05      0.453      0.651    -3.5e-05    5.61e-05
C(iso3)[T.TUN]            0.0001   5.41e-05      1.891      0.059   -3.75e-06       0.000
C(iso3)[T.UKR]         -4.75e-05   3.14e-05     -1.513      0.130      -0.000     1.4e-05
C(year)[T.2016]       -3.421e-05   2.91e-05     -1.178      0.239   -9.11e-05    2.27e-05
C(year)[T.2017]        1.606e-05   6.04e-05      0.266      0.790      -0.000       0.000
C(year)[T.2018]       -5.683e-05   3.92e-05     -1.448      0.148      -0.000    2.01e-05
C(year)[T.2019]       -4.194e-06   8.66e-05     -0.048      0.961      -0.000       0.000
C(year)[T.2020]       -6.852e-05   7.01e-05     -0.978      0.328      -0.000    6.88e-05
C(year)[T.2021]       -8.411e-05    7.8e-05     -1.078      0.281      -0.000    6.88e-05
C(year)[T.2022]       -6.963e-05    7.6e-05     -0.916      0.359      -0.000    7.93e-05
C(year)[T.2023]       -4.415e-06   9.04e-05     -0.049      0.961      -0.000       0.000
battle_deaths_per_100k -1.571e-05   1.69e-05     -0.928      0.353   -4.89e-05    1.75e-05
pou                   -5.572e-06   2.05e-05     -0.272      0.786   -4.58e-05    3.46e-05
fies                  -9.396e-07   5.22e-06     -0.180      0.857   -1.12e-05     9.3e-06
==============================================================================
Omnibus:                        3.559   Durbin-Watson:                   2.246
Prob(Omnibus):                  0.169   Jarque-Bera (JB):                2.953
Skew:                           0.627   Prob(JB):                        0.228
Kurtosis:                       3.018   Cond. No.                         252.
==============================================================================

Notes:
[1] Standard Errors are robust to cluster correlation (cluster)
```

Coefficients CSV: `reports/tables/regression_c_Male_coef.csv`

2.14.2.2 Outcome: b

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      b   R-squared:                       0.966
Model:                            OLS   Adj. R-squared:                  0.949
Method:                 Least Squares   F-statistic:                     14.93
Date:                Thu, 05 Feb 2026   Prob (F-statistic):             0.0113
Time:                        22:21:29   Log-Likelihood:                 215.52
No. Observations:                  45   AIC:                            -399.0
```

```
Df Residuals:                      29   BIC:                            -370.1
Df Model:                          15
Covariance Type:              cluster
===========================================================================================
                           coef    std err          z      P>|z|      [0.025      0.975]
-------------------------------------------------------------------------------------------
Intercept                0.1003      0.004     28.613      0.000       0.093       0.107
C(iso3)[T.POL]          -0.0079      0.002     -3.335      0.001      -0.013      -0.003
C(iso3)[T.ROU]          -0.0013      0.001     -1.028      0.304      -0.004       0.001
C(iso3)[T.TUN]           0.0206      0.004      5.449      0.000       0.013       0.028
C(iso3)[T.UKR]          -0.0094      0.003     -2.827      0.005      -0.016      -0.003
C(year)[T.2016]         -0.0015      0.001     -1.435      0.151      -0.003       0.001
C(year)[T.2017]         -0.0015      0.001     -1.184      0.237      -0.004       0.001
C(year)[T.2018]         -0.0023      0.001     -1.564      0.118      -0.005       0.001
C(year)[T.2019]         -0.0016      0.001     -1.140      0.254      -0.004       0.001
C(year)[T.2020]          0.0007      0.002      0.339      0.735      -0.003       0.005
C(year)[T.2021]          0.0015      0.003      0.472      0.637      -0.005       0.008
C(year)[T.2022]         -0.0026      0.002     -1.491      0.136      -0.006       0.001
C(year)[T.2023]         -0.0020      0.002     -1.252      0.211      -0.005       0.001
battle_deaths_per_100k  -0.0018      0.000     -4.709      0.000      -0.002      -0.001
pou                     -0.0012      0.001     -1.668      0.095      -0.003       0.000
fies                    -0.0004      0.000     -1.101      0.271      -0.001       0.000
==============================================================================
Omnibus:                       18.038   Durbin-Watson:                   1.727
Prob(Omnibus):                  0.000   Jarque-Bera (JB):               37.550
Skew:                           0.997   Prob(JB):                     7.02e-09
Kurtosis:                       7.006   Cond. No.                         252.
==============================================================================

Notes:
[1] Standard Errors are robust to cluster correlation (cluster)
```

Coefficients CSV: `reports/tables/regression_b_Male_coef.csv`

2.14.2.3 Outcome: `h`

```
                            OLS Regression Results
==============================================================================
Dep. Variable:                      h   R-squared:                       0.832
Model:                            OLS   Adj. R-squared:                  0.746
Method:                 Least Squares   F-statistic:                     2.164
Date:                Thu, 05 Feb 2026   Prob (F-statistic):              0.237
Time:                        22:21:29   Log-Likelihood:                 329.69
No. Observations:                  45   AIC:                            -627.4
Df Residuals:                      29   BIC:                            -598.5
Df Model:                          15
Covariance Type:              cluster
===========================================================================================
                           coef    std err          z      P>|z|      [0.025      0.975]
-------------------------------------------------------------------------------------------
Intercept               -0.0010      0.000     -2.784      0.005      -0.002      -0.000
C(iso3)[T.POL]           0.0005      0.000      2.412      0.016    8.69e-05       0.001
C(iso3)[T.ROU]       -3.766e-05   9.79e-05     -0.385      0.700      -0.000       0.000
C(iso3)[T.TUN]           0.0004      0.000      1.463      0.144      -0.000       0.001
C(iso3)[T.UKR]          -0.0004      0.000     -1.216      0.224      -0.001       0.000
```

```
C(year)[T.2016]         2.311e-05   6.55e-05      0.353      0.724      -0.000       0.000
C(year)[T.2017]          7.49e-05   8.66e-05      0.865      0.387   -9.47e-05       0.000
C(year)[T.2018]            0.0001   8.46e-05      1.494      0.135   -3.95e-05       0.000
C(year)[T.2019]          2.59e-05   5.54e-05      0.467      0.640   -8.27e-05       0.000
C(year)[T.2020]        -4.405e-05      0.000     -0.356      0.722      -0.000       0.000
C(year)[T.2021]           -0.0001      0.000     -0.546      0.585      -0.001       0.000
C(year)[T.2022]            0.0002      0.000      1.318      0.187   -9.89e-05       0.001
C(year)[T.2023]            0.0001   8.65e-05      1.178      0.239   -6.77e-05       0.000
battle_deaths_per_100k  4.846e-05   5.68e-05      0.853      0.394   -6.29e-05       0.000
pou                        0.0002   7.89e-05      2.714      0.007    5.95e-05       0.000
fies                    3.117e-05   2.69e-05      1.159      0.246   -2.15e-05    8.39e-05
==============================================================================
Omnibus:                        8.358   Durbin-Watson:                   1.684
Prob(Omnibus):                  0.015   Jarque-Bera (JB):               16.281
Skew:                          -0.183   Prob(JB):                     0.000291
Kurtosis:                       5.924   Cond. No.                         252.
==============================================================================

Notes:
[1] Standard Errors are robust to cluster correlation (cluster)
```

Coefficients CSV: `reports/tables/regression_h_Male_coef.csv`

2.15 Notes

3 Results

This file is intentionally lightweight. Run the pipeline to populate: - `reports/figures/` for event-study figures - `reports/tables/` for regression outputs and summaries

3.1 India SRS (optional add-on)

If you have `SRS-Abridged_Life_Tables_2018-2022.pdf` in the repo root, you can extract and fit models for India + states/UTs:

```
python3 scripts/05_extract_srs_life_tables.py
python3 scripts/55_fit_srs_models.py
```

Key outputs: - `data/intermediate/srs_abridged_life_tables_2018_22.csv` - `data/processed/srs_params.parquet` - `data/processed/srs_urban_rural_deltas.parquet` - `reports/figures/srs/` (Urban − Rural delta plots; optional hazard overlays)

3.2 Extra APIs (optional)

If your environment has internet access, you can fetch additional series:

```
python3 scripts/11_fetch_wdi_extra.py
python3 scripts/12_fetch_who_gho.py
```