

# YOUNG ADULTS' MORTALITY HUMP AN INTRINSIC AND UNIVERSAL PHENOMENON?

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## Research question

### Competing theories

#### Endogenous

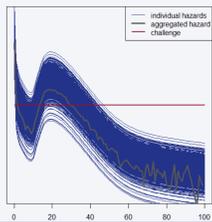
Young adults' excess mortality stems from the individuals' endogenous turmoil and/or limited ability to deal with risky situations. This intrinsic weakness increases their risk of death (Hall 1904, Steinberg 2005).

#### Exogenous

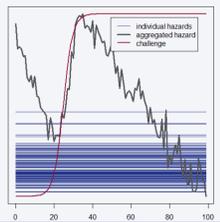
Young adults are not different from other adults, and their temporary excess mortality arises from their heterogeneous resources to cope with the challenges of the transition to adulthood.

### Implications for individual hazard

Each and every individual experiences an increase in his/her personal hazard. The aggregated risk of death reflects this common feature.



Individual hazards are constant over time. The hump observed in the aggregated data is the effect of selection through unobserved heterogeneity (Vaupel et al. 1979, 1985).



### Consequences regarding universality

A hump should always be observable as long as "risky" activities exist, because it is in young adults' nature to engage in them.

Whenever the challenges become smaller, the selection process reduces and the hump shrinks, at times disappearing.

Are there any periods for which no mortality hump is observed?

## Data & Methods

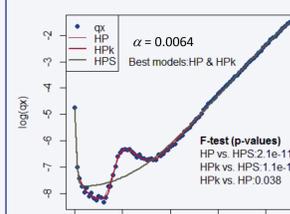
### Data

- 34 countries of the Human Mortality Database
  - period age-specific mortality rates (ASMR): 1751-2010 (up to age 90)
  - cohort age-specific mortality rates (ASMR): 1751-1980 (up to age 90)
- Completion of truncated cohorts with a gompertzian trend (inferred on ages 30+)

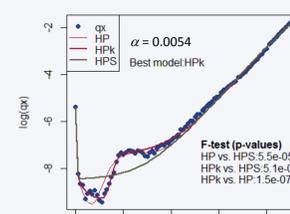
### Methods

- Non-linear least squares modelling of  $q_x$  by period, cohort and sex, using:
  - Heligman & Pollard (1980): HP  $q_x = A^{(x+B)^C} + De^{-E(\ln x - \ln F)^2} + \frac{GH^x}{1+GH^x}$
  - Kostaki (1992): HPk  $q_x = \begin{cases} A^{(x+B)^C} + De^{-E(\ln x - \ln F)^2} + \frac{GH^x}{1+GH^x} & \forall x \leq F \\ A^{(x+B)^C} + De^{-E(\ln x - \ln F)^2} + \frac{GH^x}{1+GH^x} & \forall x > F \end{cases}$
  - A custom-built fusion of HP and Siler (1979): HPS  $q_x = A^{(x+B)^C} + D + \frac{GH^x}{1+GH^x}$
- Comparison of goodness of fit between the extended (HPk) and restrained (HPS) models to assess the relevance of the extra parameters accounting for the hump (D, E, F, k).
- Significance level:  $\alpha = \frac{10^5}{\sum pop}$  (period),  $\alpha = \frac{10^5}{T_0 \cdot births}$  (cohort), e.g.  $\alpha = 0.01$  when pop.=10M.

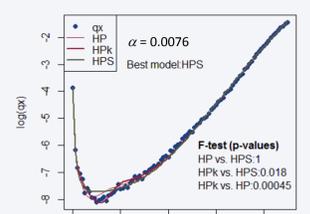
Swiss males 1980-1984



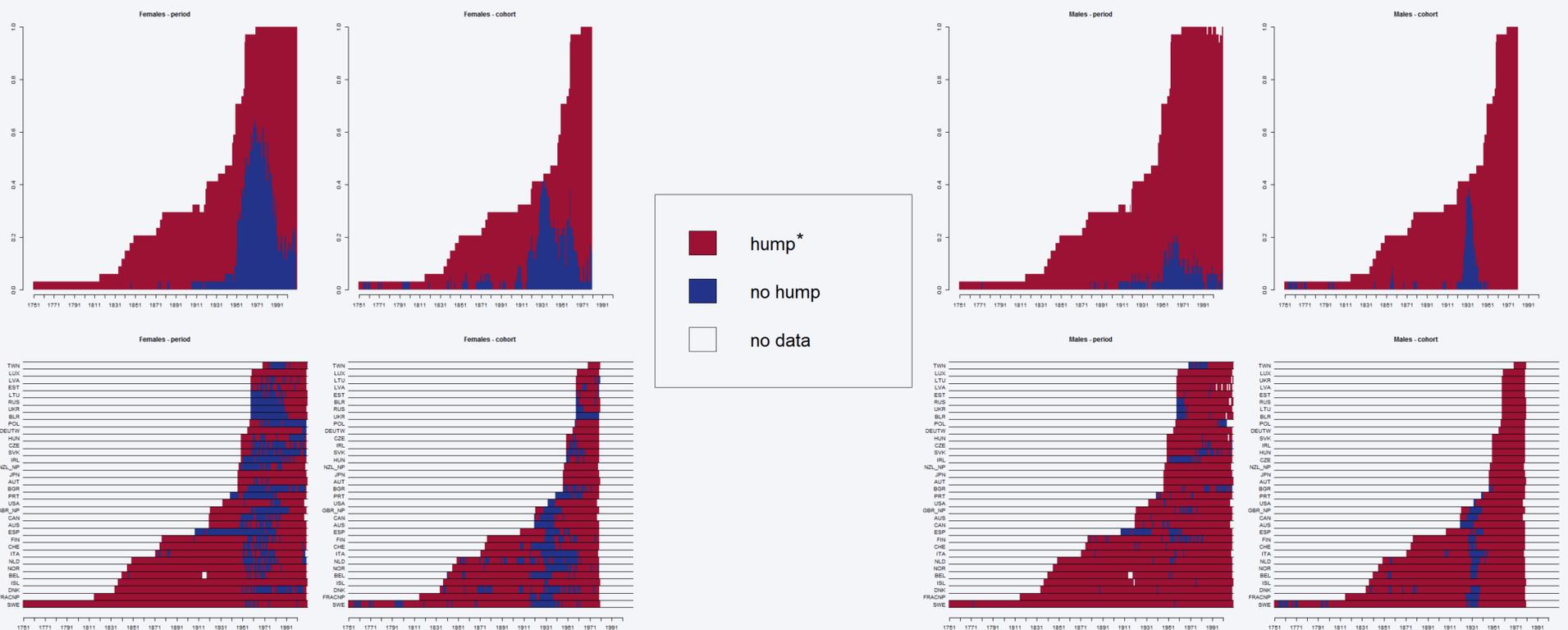
Swiss males 2005-2009



Swiss females 1955-1959



## Results



\* A year/cohort is considered containing a hump if and only if the HPk model significantly improves the goodness of fit compared to the HPS model (see the method section above).

## Discussion

- There are periods and cohorts in which no hump is observed, which supports the exogenous theory. These periods are located within specific socioeconomic contexts:
  - Women: the 1920s-1960s generations, reflecting into the period from WW2 until the 1980s, i.e. between maternal mortality and the end of the male breadwinner model.
  - Men: the 1925-1935 generation, i.e. the "Children of the Great Expansion" who entered adulthood in a foreseeable world of abundance (Elder 1974, Easterlin 1978).
  - Minimal insecurity (1945-73 economic boom, 1940s-1960s pinnacle of the traditional family, post-WW2 development of lifelong careers) characterises those moments in time.
- Some countries experienced no hump for relatively long periods:
  - Women: former USSR satellites until 1990 (an effect of protective social systems?)
  - Women & men: Spain, Ireland and Bulgaria (a selection effect in times of massive out-migration, i.e. departure of the most vulnerable individuals?)
- However, recent decades have witnessed an increase in adult life course insecurity, hitting especially the young adults (Blossfeld et al. 2005), reflected in the return of the hump.
- Further research: Cause-of-death analyses should help determine whether the humps before and after WW2 can be interpreted in the same way.

## References

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