Visualisation of fertility trends: Switzerland as a case study

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Aims of presentation

To introduce the HFC data for Switzerland - similar to HFD data but from ‘unofficial’ sources, ie. my derivation of biological birth orders from marital birth orders for 1969-2009 (see MPIDR Technical Report for more information)

To illustrate some of the points already made in this symposium, using Switzerland as an example - or as a counter-example
1. Special features of Swiss population

2. Period trends

3. Cohort trends

4. Birth spacing
Special features of Swiss population
Swiss demographic landscape

• Possibly world's highest mean age at first birth (almost 30)

• High proportion of women who remain childless (~20%)

• TFR reached a minimum of 1.38 in 2001, rising since then

• Relatively low proportion of births outside marriage

• High proportion of foreign nationals and strong immigration
Births outside marriage as a proportion of total births

Less than 10% until 1999
Proportion of women who are foreign for each age, census 2000

Age (women of reproductive age only)
Proportion of marriages by nationality in Switzerland in 2009

- Swiss/Swiss
- Swiss man/foreign woman
- Swiss woman/foreign man
- Foreign/foreign
Cohort sizes have changed considerably (>30% for cohorts 1965 and 1970 during the course of their reproductive life)!
<table>
<thead>
<tr>
<th>Year</th>
<th>1971</th>
<th>1981</th>
<th>1990</th>
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<tbody>
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<td>Female population by age</td>
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Period trends

- Trends in timing
- Trends in fertility rates by birth order
- Recent rise in TFR
Changes in fertility rate curves in period 1969-2009

Peak has become later (tempo change)

Peak has become lower (quantum change)

Curve has become wider

Curve has changed from being skewed left to nearly symmetric
Trends in birth order 1 fertility rates
In 1970 there was 11 years between modal age of 1st and 4th births.

In 2007 the difference was only 2 years!
Birth order 1 increase started 1971
Birth order 2 increase started 1973
Birth order 3 increase started 1980
Birth order 4 increase started 1986
Birth order 5+ increase started 1991

Gap between mean age at 1st birth and 4th birth declined from 8 years in 1972 to 4.9 in 1990 and since then has been steady
Age-specific birth rates as proportion at same age in 1969-70-71
Birth order 1 increase started 1994
Birth order 2 increase started 1995
Birth order 3 increase started 1998
Birth order increase started 2001
Birth order 5+ increase started 2001

Reversal in order! 1st births had least variability, now most; high parities were most variable, now least
Corrected TFR is significantly higher than raw TFR.
Marked rise 1976-1984, followed by gentle fall
Slight peak in 2000 followed by sharp dip in 2001
Since 2001 has been steadily rising

Rise in TFR between 2001 and 2006 was due to rise in birth order 1 fertility rates, ie. decline in incidence of childlessness

Rise in TFR between 2007 and 2009 was due to increase in birth order 2 fertility rates
<table>
<thead>
<tr>
<th>Year</th>
<th>Birth order 1</th>
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**Birth order 1**

- Difference (birth rate in year x for age y) - (birth rate in year x-5 for age y-1)

**Birth order 2**

- Difference (birth rate in year x for age y) - (birth rate in year x-5 for age y-2)
Cohort trends

- By birth order
- Cohort-period model
- Comparison of different data sets
Model for estimating cohort fertility before full reproductive life is complete

Can use it as soon as cohort has passed age of peak fertility for birth order 1 (ideally also birth order 2)

Use cohort data to complete the curve with current year’s period data. This will ‘probably’ give an under-estimate of total fertility of youngest cohorts, as ongoing postponement will cause ongoing depression of fertility rates (for a while).

Can be improved by making Bongaarts-Feeney correction to this added period data. However, this might give an over-estimate of the total cohort fertility, as there is ‘likely’ to be a slowing down on postponement in the future.
Cohort fertility, birth order 1

Extrapolated using 2009 period data

Birth order 1 fertility rate

Cohort - year of birth
Comparison of CCF (from census and birth registration) and TFR*+27

- **Census 2000+**
- **Birth reg+model 1**
- **Birth reg+model 2**
- **TFR* for t+27**

Number of children per woman

Cohort - year of birth

Birth spacing

• (Not) difference in mean age of successive birth orders
• Spacing data from surveys
• Why these are very different
Differences in mean age at nth and (n+1)th birth

- 1st-2nd birth
- 2nd-3rd birth
- 3rd-4th birth

Years:
- 1969
- 1970
- 1971
- 1972
- 1973
- 1974
- 1975
- 1976
- 1977
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- 2006
- 2007
- 2008
- 2009
Data on spacing in Switzerland

FFS sample data from 1994 for women aged 40-44

ie. cohorts 1950-1954

Mean age at 1st birth 26.9
Spacing 1st-2nd child: 3.13 years
Spacing 2nd-3rd child: 3.62 years
Spacing 3rd-4th child: 3.13 years

Deduced age at 2nd birth 30.0
Deduced age at 3rd birth 33.6
Deduced age at 4th birth 36.8

Houle & Shkolnikov, 2006
Mean age at 1st birth: 27
Mean age at 2nd birth: 30
Mean age at 3rd birth: 33
Mean age at 4th birth: 36

Mean spacing between all birth orders: 3 years
Mean age at last birth: 31.5
Scenario 2

Mean age at 1st birth: 31.5
Mean age at 2nd birth: 33
Mean age at 3rd birth: 34.5
Mean age at 4th birth: 36
Mean spacing between all birth orders: 3 years
Mean age at last birth: 36
Conclusions

We cannot deduce anything about birth spacing from differences in mean age at successive birth orders!

We cannot deduce anything about mean age of successive birth orders from information on birth spacing!

Hypothesis: around 1970 scenario 1 was the norm; this has evolved to become scenario 2. But need evidence for this (census 2000, Swiss Household Panel?)!

(something for me to work on)
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To question your mathematical models: do they make allowances for:

- Migration?
- Increase in width of fertility curve (more timing variation)?
- Change of shape of fertility curve?

(something for you to work on?)
Thank you!
Comparison of period and cohort fertility curves, birth order 1

- **1960 cohort**
- **1975 period**
- **1986 period**

TFR 1 1960 cohort = 0.83
TFR 1 1975 period = 0.73
TFR 1 1986 period = 0.70

*Graph showing fertility rates by age of mother for different cohorts and periods.*
Comparison of period and cohort fertility curves, birth order 1

- 1965 cohort
- 1980 period
- 1991 period

TFR 1 1965 cohort = 0.79
TFR 1 1980 period = 0.71
TFR 1 1991 period = 0.74