Mortality in Eastern Europe during the 20th century: the marks of political history

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Demographic trends in Russia: legacy of the soviet era or a new tendency?
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Central and Eastern Europe during the 20th century

• A chaotic history impacting the health of populations:
  → deadly events: famines, WWs, holocaust
  → political disruptions : the split of the USSR, the German reunification
  → long term trends (favourable or unfavourable) closely linked to the political regime

• Lacking, falsified or hidden data
Convergences and divergences
The emblematic case of Ukraine

Life expectancy (years)

Famine

WW2

Females

Males

Health crisis

Famine

The emblematic case of Ukraine

Life expectancy (years)

- Females
- Males

Key events:
- A performing health system
- Anti-alcohol campaign
- Split of the USSR
- Russo-Ukrainian conflict
I. The short-term impact of political events
A. Ukraine: Estimating the toll of the Great Famine
The Great Famine (1932-1934)

• A man-made famine in Soviet Union.
• The conjunction of a poor harvest and a systematic grain requisitioning, especially in Ukraine.
• In that country, the « Holodomor » (Голодомо́р derived from морити голодом = to kill by starvation) is considered as a genocide.
• Long denied by the Soviet regime.
How many deaths due to the famine in Ukraine?

• Global losses (including deaths, birth deficit and net out-migration) range from 4 to 20 millions

• A few estimates restricted to the number of deaths, relying as much as possible on existing data (vital statistics, 1926 and 1939 census):

  → Vallin et al. (2002): 2.6 millions
  → Rudnytskyi et al. (2015): 4.6 millions

B. Russia: antialcohol campaign and split of the USSR
Large fluctuations from 1984 to 1997

Life expectancy at birth (years)


Females

Males

Anti-alcohol campaign
Economic crisis

The short lived effect of anti-alcohol campaign

The strong impact of the economic crisis
C. The fall of Berlin Wall and the German reunification
Shock and catch-up

Life expectancy at birth

FEMALES

West Germany

East Germany

MALES

West Germany

East Germany

Standardized mortality rate (p. 100 000)

Circulatory diseases

Neoplasms

External causes

Digestive diseases

Solid line: East Germany

Dotted line: West Germany

Solid line: East Germany

Dotted line: West Germany
Long-term trends and political history
The case of Baltic States

- First Independence after WW1
- Forced annexation by the Soviet Union, and German occupation (1941-1944), extermination of the Jewish population during WW2
- Inclusion in the USSR (1944-1991)
- New Independence and entrance in the EU

The case of Baltic states

In the 1930s, levels close to Western ones and much higher than in Russia
The case of Baltic states

In the 1950s, a rapid convergence thanks to the dramatic decline of infant mortality

Life expectancy at birth

**MALES**

- Latvia
- Lithuania
- Russia
- Estonia
- France

**FEMALES**

- Latvia
- Lithuania
- Russia
- Estonia
- France
The case of Baltic states

From 1965 to 1995, unfavourable trends common to all Soviet countries

Life expectancy at birth

**MALES**

- France
- Estonia
- Lithuania
- Russia
- Latvia

**FEMALES**

- France
- Estonia
- Lithuania
- Latvia
- Russia
The case of Baltic states

From the late 1990s, a clear trend reversal
A remarkable similarity of long-term trends during the political division East/West

A general health crisis in Central and Eastern Europe

• More severe in countries of the former USSR than in Central Europe
• More serious for males than for females
• Particularly marked at adult working ages

From 1965 to 1985, Russian men lost 1.6 years in life expectancy at birth, and 2.3 years in life expectancy at age 15
In the early 1990s, diverging trends between Central and Eastern Europe

- After the fall of the Berlin Wall and the breakdown of the USSR, life expectancy in Central Europe began to progress again, one country after another.
- Republics of the former USSR entered a very chaotic period with huge fluctuations due to Gorbachev’s anti-alcohol campaign, its subsequent loosening and the transition to a market economy.
- Finally, in the 2000s, late-runners started catching up.
Central Europe

Life expectancy at birth (years)

FEMALES

MALES

East Germany
Hungary
Czech R.
Romania
Poland.
Bulgaria
Slovakia

Former USSR

Life expectancy at birth (years)

FEMALES

MALES

Russia
Estonia
Belarus
Latvia
Ukraine
Lithuania

Central Europe

Former USSR
A dramatic male mortality increase at working ages, followed by a reduction over a wider range of ages.
Changes in male life expectancy: circulatory diseases and external causes are the main contributors.

- **Poland 1965-1991**
  - Contribution (years) vs. Age
  - Key: External causes, Other disease, Digestive disease, Respiratory disease, Circulatory disease, Cancer, Infectious disease

- **Russia 1965-2005**
  - Contribution (years) vs. Age
  - Key: External causes, Other disease, Digestive disease, Respiratory disease, Circulatory disease, Cancer, Infectious disease

- **Poland 1991-2016**
  - Contribution (years) vs. Age
  - Key: External causes, Other disease, Digestive disease, Respiratory disease, Circulatory disease, Cancer, Infectious disease

- **Russia 2005-2014**
  - Contribution (years) vs. Age
  - Key: External causes, Other disease, Digestive disease, Respiratory disease, Circulatory disease, Cancer, Infectious disease
Notable progress at old ages for females
When divergence started in the mid-1960s, all European countries were completing their epidemiologic transition, as defined by Omran.

They had entered the 3rd age of man-made and degenerative diseases.

Western European countries were very rapidly able to control and reduce those diseases, especially circulatory diseases.

Central and Eastern European countries, in contrast, did not succeed.
• A 4th age of the epidemiologic transition:
  → “Age of delayed degenerative diseases” (Olshansky and Ault, 1986)
  → “The hybristic stage”, the age of diseases related to behaviour and lifestyle (Rogers and Hackenberg, 1987)

• Rethinking the whole perspective:
  → The health transition (Frenk et al., 1991)
  → A succession of divergence and convergence processes (Vallin and Meslé, 2004)
The succession of divergence/convergence processes

- Any major factor of improvement in life expectancy results in a phase of divergence. After some time “laggers” catch up with the pioneers in a convergence phase.
- In the case of the cardiovascular revolution, factors of improvement were complex:
  - Medical factors: prevention, systematic screening, new drugs, new surgery, emergency services, ...
  - Economic factors: curing chronic diseases costs a lot and requires a new organisation of the health system, ...
  - Social and behavioral factors: decrease in alcohol and tobacco consumption, improving diet quality, ...
- It took Central and Eastern European countries much more time to enter this stage than most Western European countries, but the convergence is now occurring.
According to “Divergence-convergence” theory:

→ Sub-national trends may follow the same rule: Gender gap? Regional differences? Social inequality?

→ New improvements cause new processes of divergence/convergence and a new process can start even if the previous one has not ended: Moving to older and older ages
A narrowing gap between males and females...
But differences are still huge

Contribution (years)

Poland 2016

Russia 2014

Age

Age

-1.0
-0.5
0.0
0.5
1.0
1.5
0 5 15 25 35 45 55 65 75 85
Contribution (years)

Age

-1.0
-0.5
0.0
0.5
1.0
1.5
0 5 15 25 35 45 55 65 75 85
Contribution (years)

- External causes  
- Other dis  
- Digestive dis.  
- Respiratory dis.  
- Circulatory dis.  
- Cancer  
- Infectious dis.  

Legend:
For females, the gap with the most advanced countries is now decreasing at all ages.
Let’s be optimistic!
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Observed population at 1926 census by age and sex: 29.0 millions

1st projection: fertility without crisis, mortality without crisis, no migrations

Actual evolution

2nd projection: actual est. fertility, mortality without crisis, no migrations

1939 Observed population: 30.9

1939 Expected population: 35.5

Birth deficit: 1.1

Total losses: 4.6

Estimation of net migration: 0.9

Crisis mortality: $4.6 - 1.1 - 0.9 = 2.6$ millions