Alcohol is the main cause of the high rates and rapid fluctuations of premature adult mortality in Russia

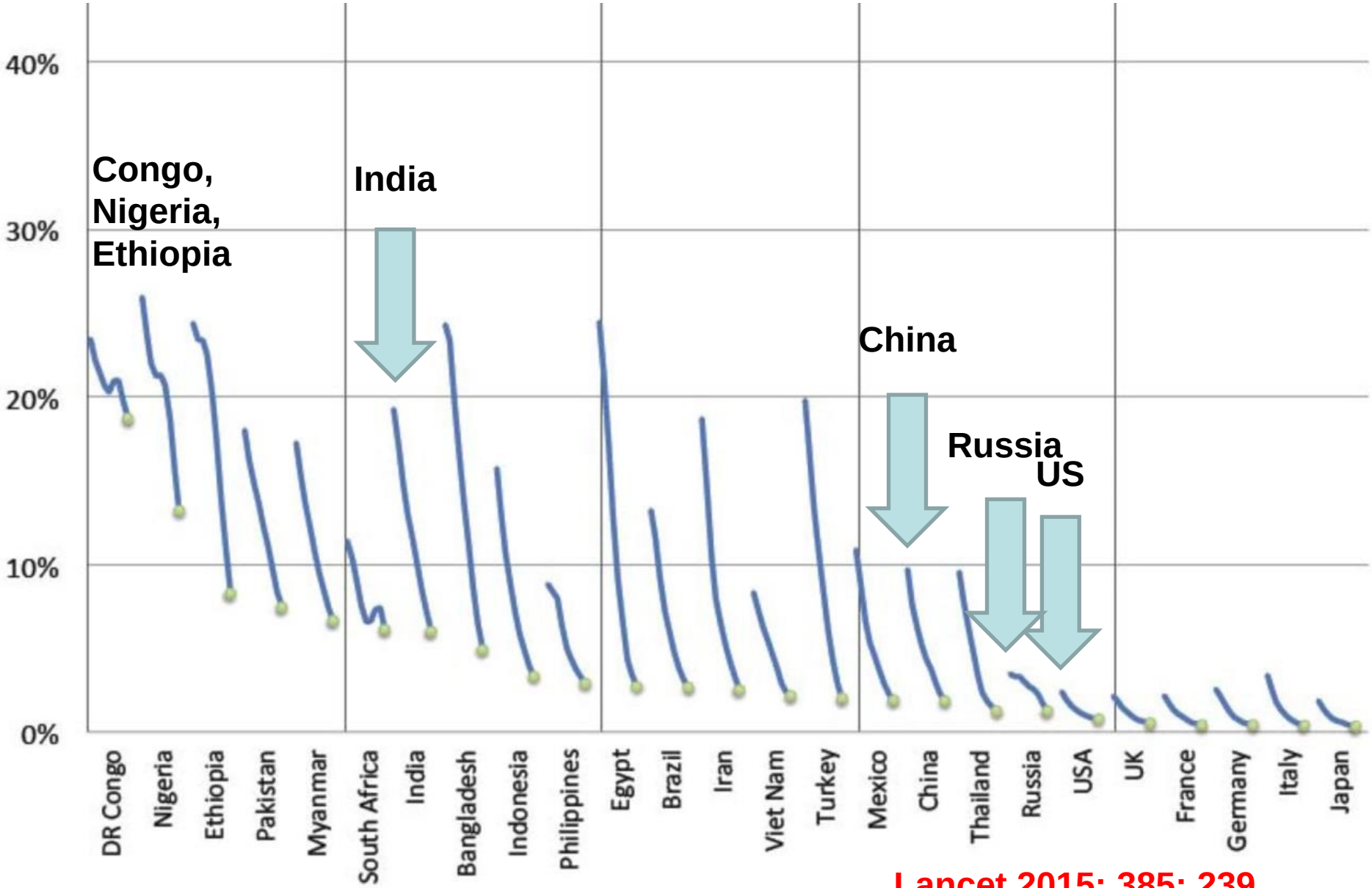
Richard Peto
University of Oxford, UK

Belgrade, April 2016
ACST-2 collaborators

25 most populous countries
(75% of 2010 world population):

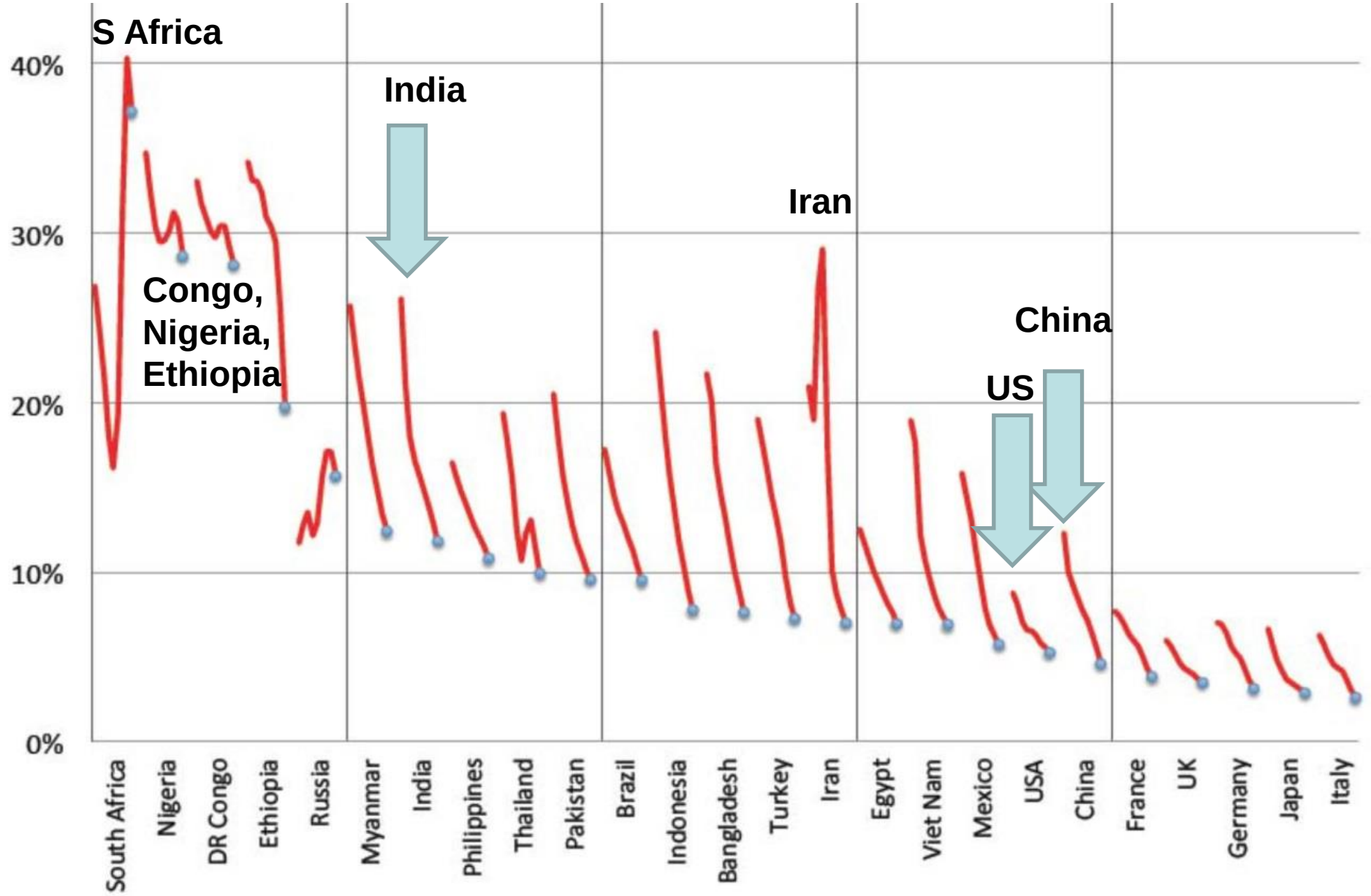
Trends in mortality rates, 1970-2010, by age
(0-4, 5-49, 50-69)

25 biggest countries: Trend, 1970-2010, in risk of death at ages 0-4 (both sexes, sorted by 2010 risk)



Lancet 2015; 385: 239

25 biggest countries: Trend, 1970-2010, in risk of death at ages 5-49 (M+F; probability of a 5-year-old dying by age 49)



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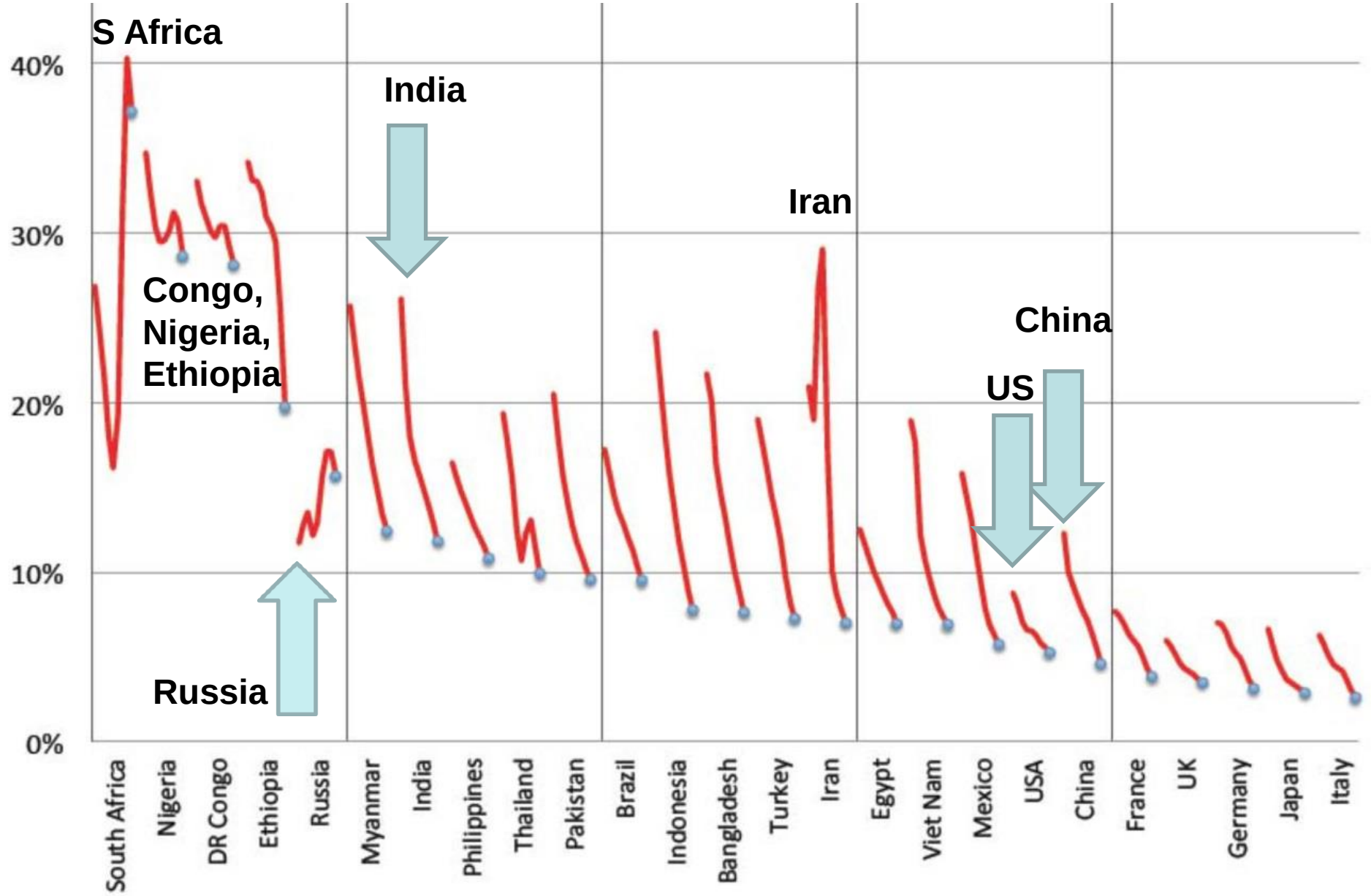
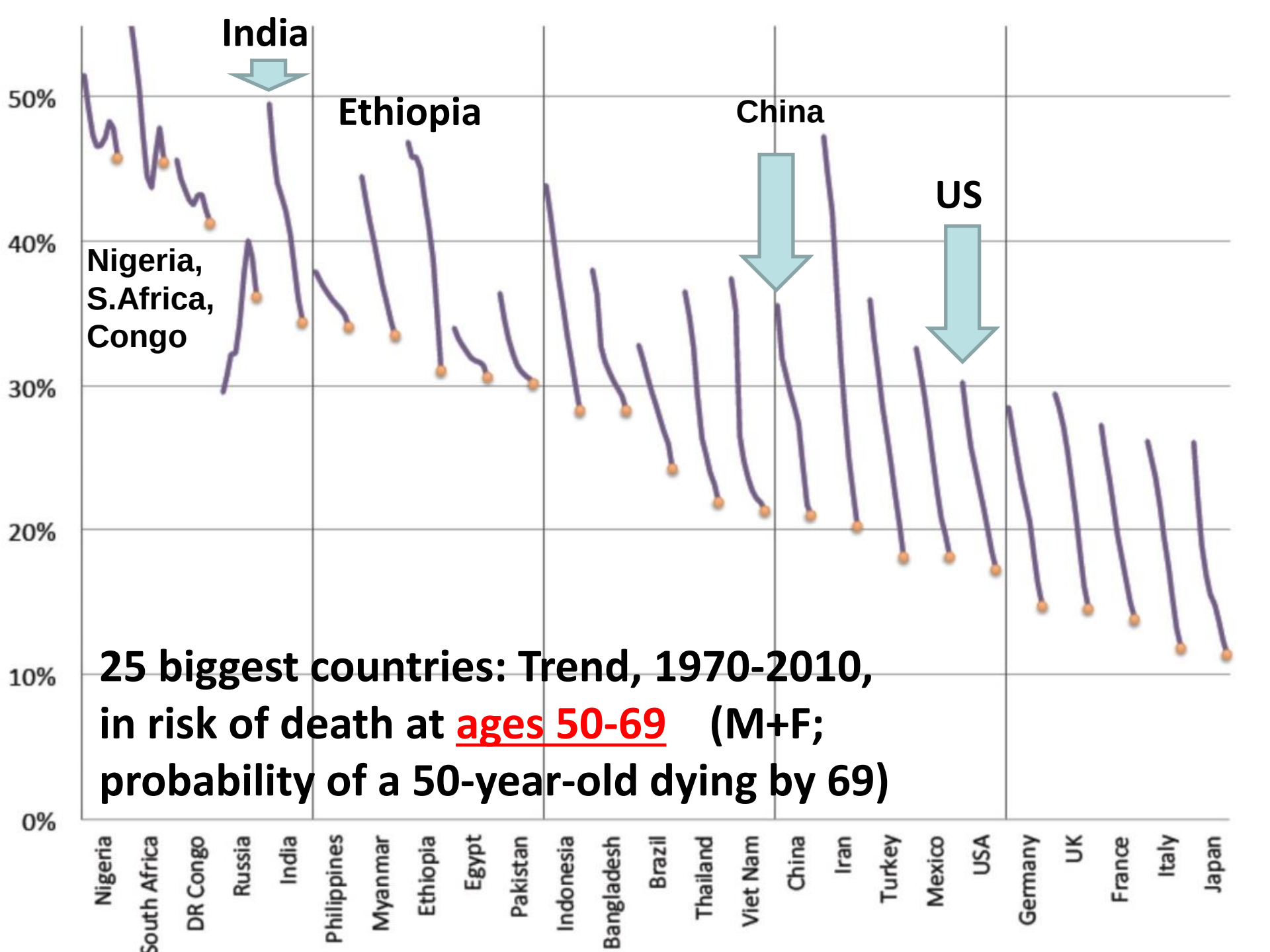
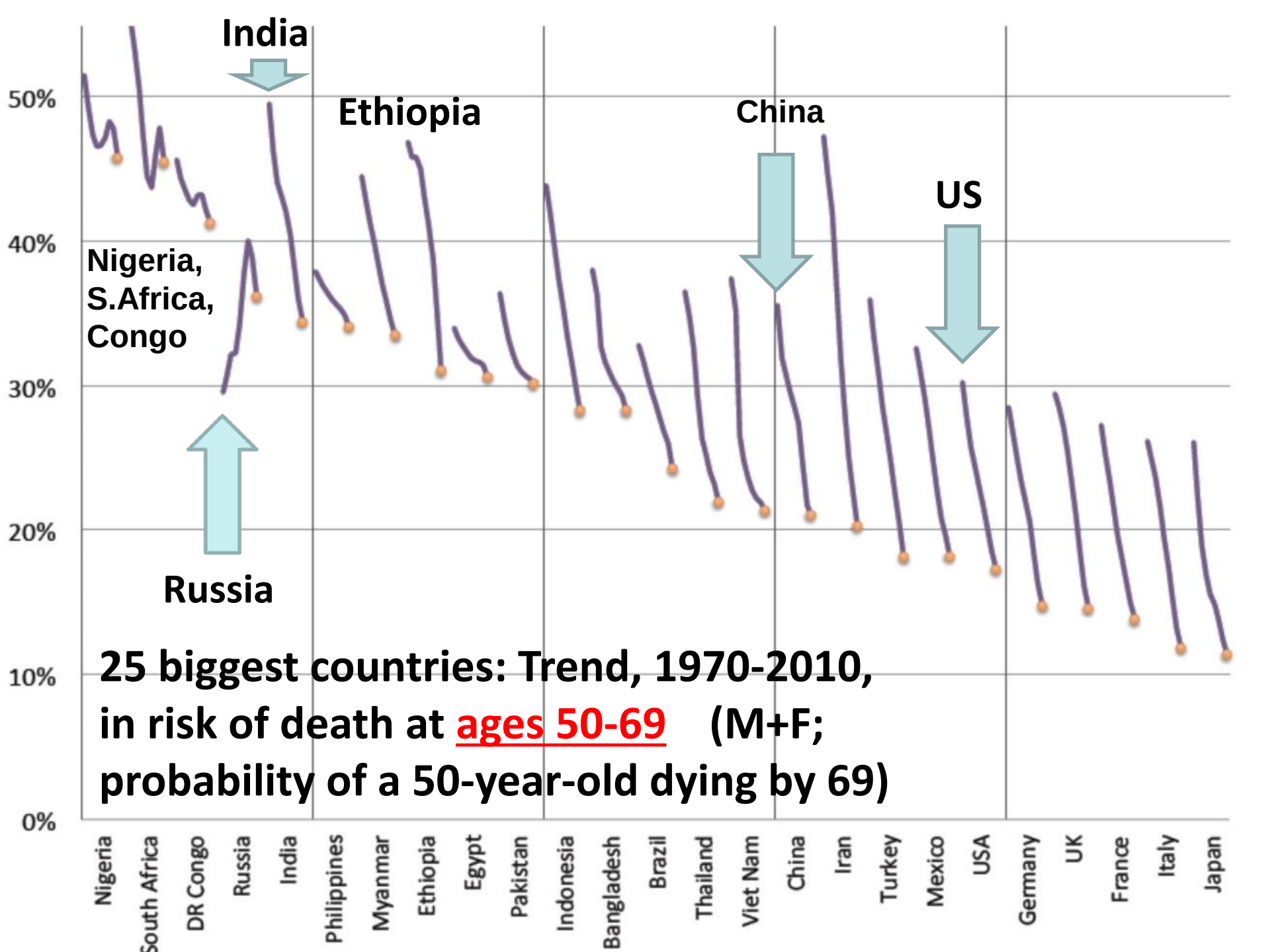



India
Ethiopia
China
US
Nigeria,
S.Africa,
Congo
50%
40%
30%
20%
10%
0%
25 biggest countries: Trend, 1970-2010,
in risk of death at ages 50-69 (M+F;
probability of a 50-year-old dying by 69)
Nigeria
South Africa
DR Congo
Russia
India
Philippines
Myanmar
Ethiopia
Egypt
Pakistan
Indonesia
Bangladesh
Brazil
Thailand
Viet Nam
China
Iran
Turkey
Mexico
USA
Germany
UK
France
Italy
Japan


India
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25 biggest countries: Trend, 1970-2010,
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Viet Nam
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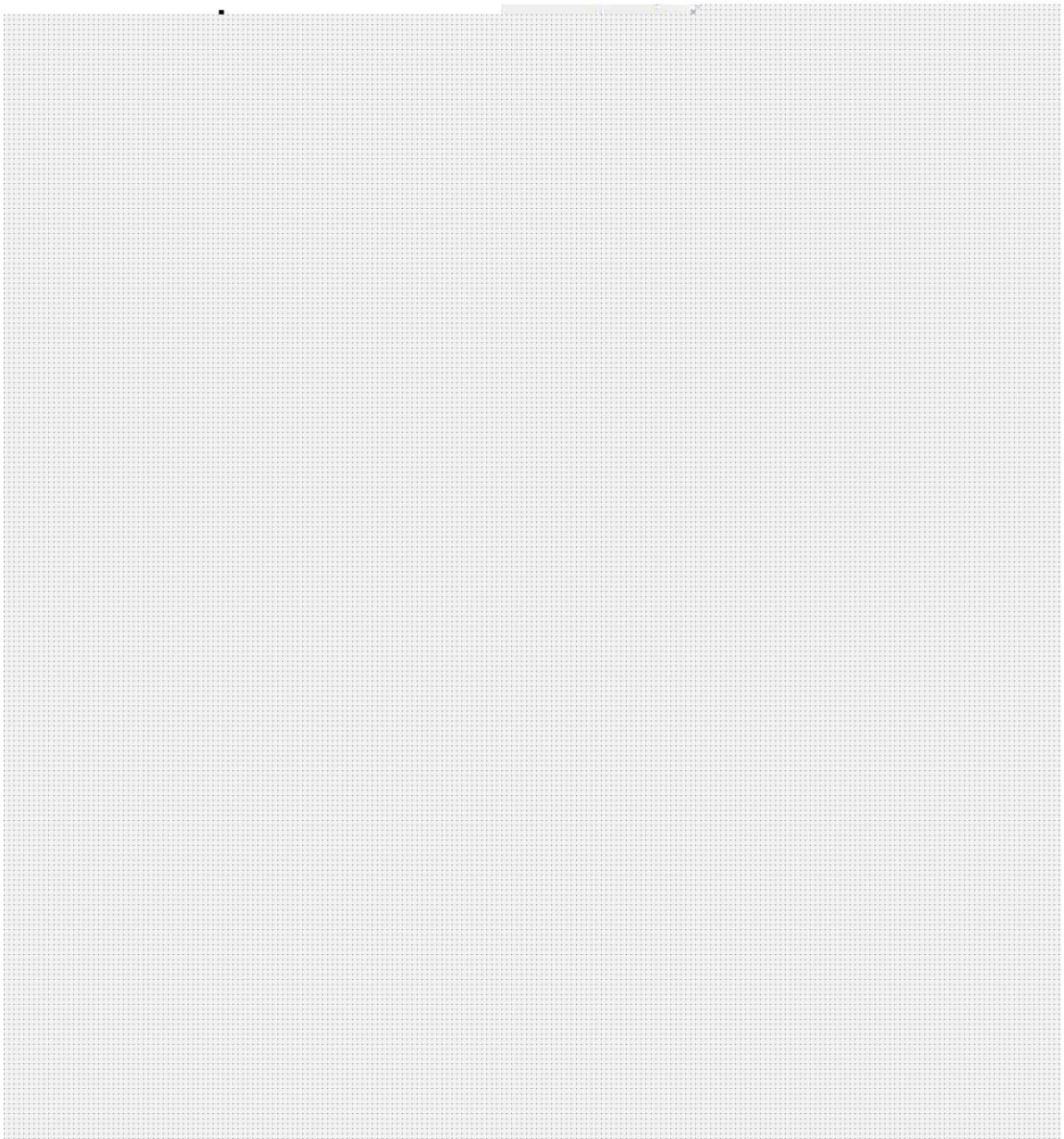
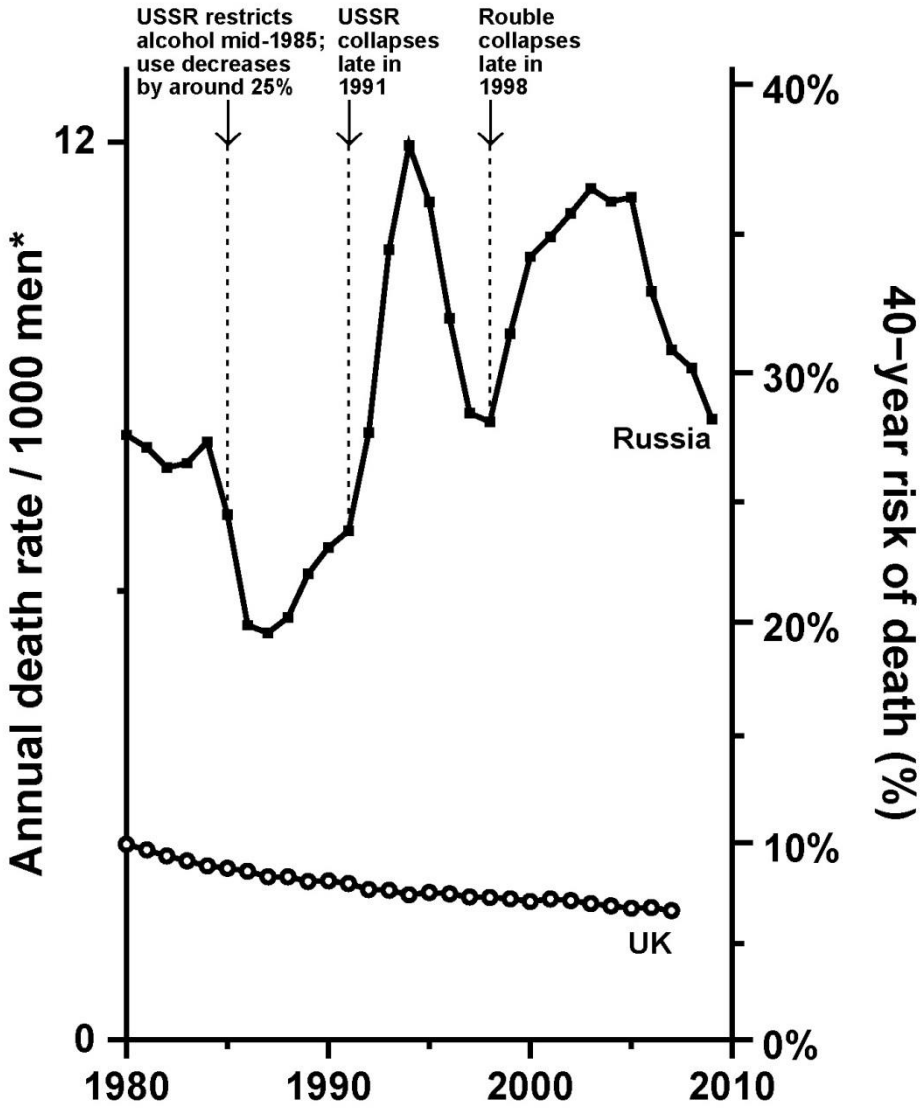
Iran
Turkey
Mexico
USA
Germany
UK
France
Italy
Japan

UK: All−cause mortality at ages 15−54



All−cause mortality, males aged 15−54, in Russia 1980−2009 and UK (to 2007)



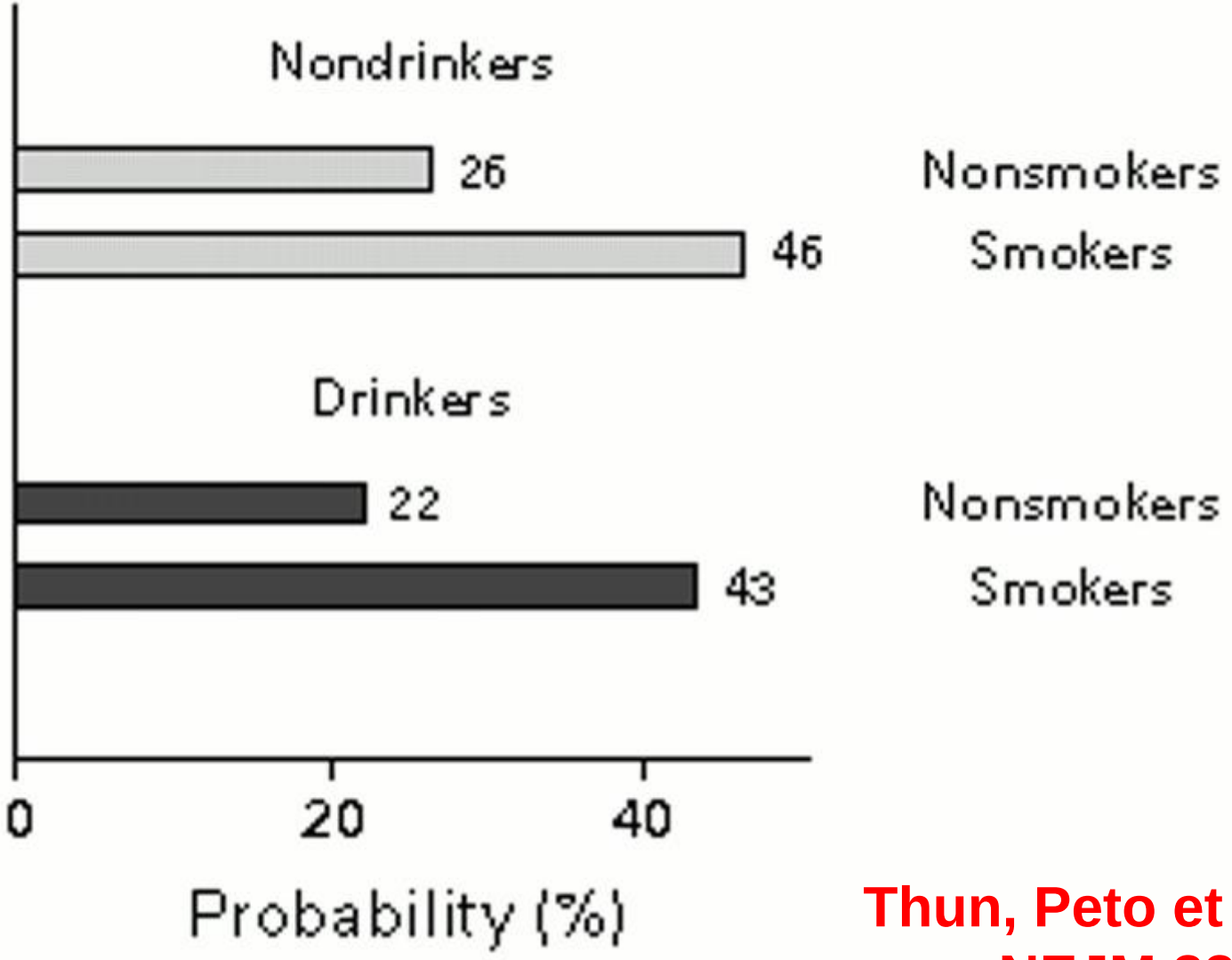
* Mean of rates in component 5−year age groups (15−19 to 50−54 years)

WHO (& 2007−9 ZAGS) mortality and UN population estimates

UK & US (& China): prospective studies find smoking causes far more deaths than drinking does

Russia is <u>different</u>

1980s prospective study of 500,000 US males: drinking, smoking & death (%) at ages 35-69



Thun, Peto et al.1997
NEJM 337: 1705

Vascular mortality trends:

UK, US, Western Europe, Poland & Russia.

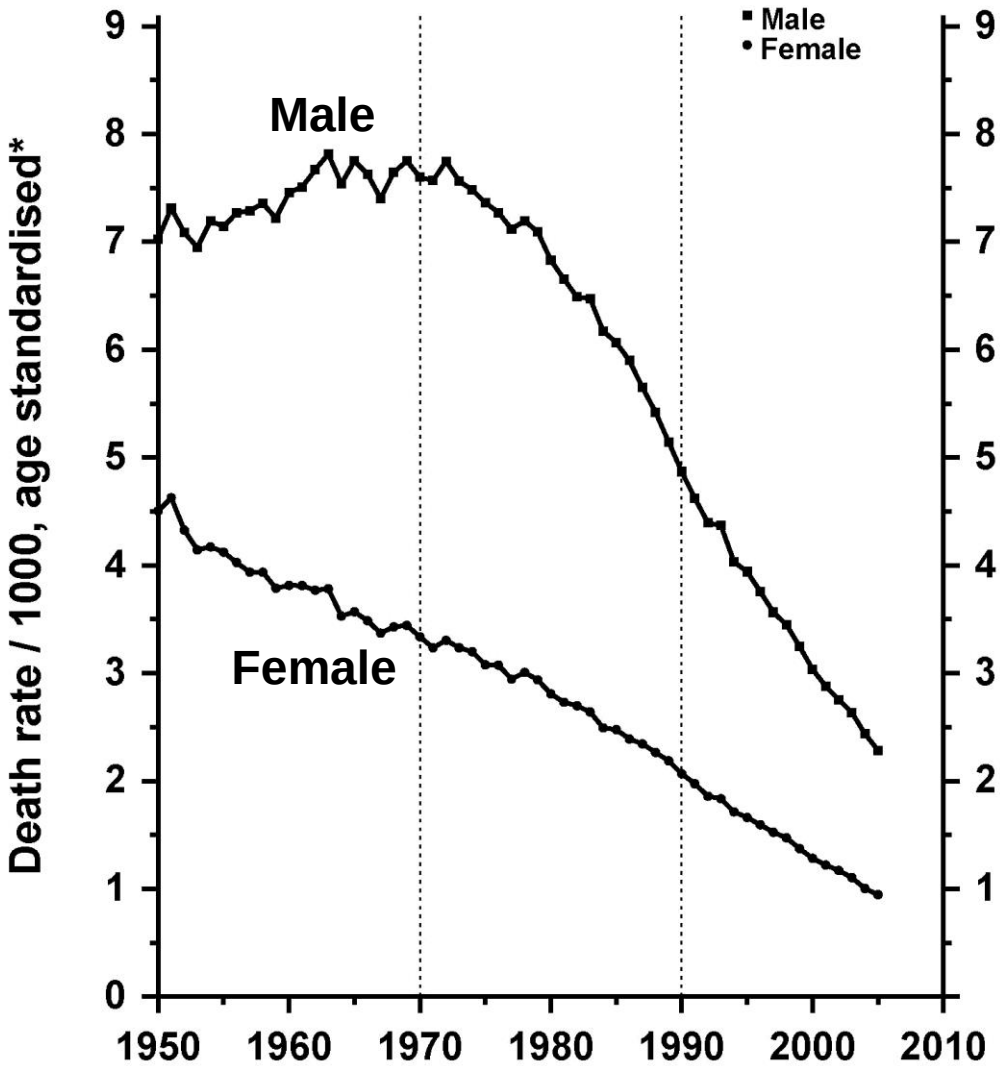
Russia is <u>different</u>

(partly because in Russia fatal alcohol poisoning or alcoholic cardiomyopathy may be misclassified as vascular death)

UNITED KINGDOM 1950−2005: Males & Females
All vascular mortality at ages 35−69

7.5 / 1000 means 25% vasc. death at ages 35-69

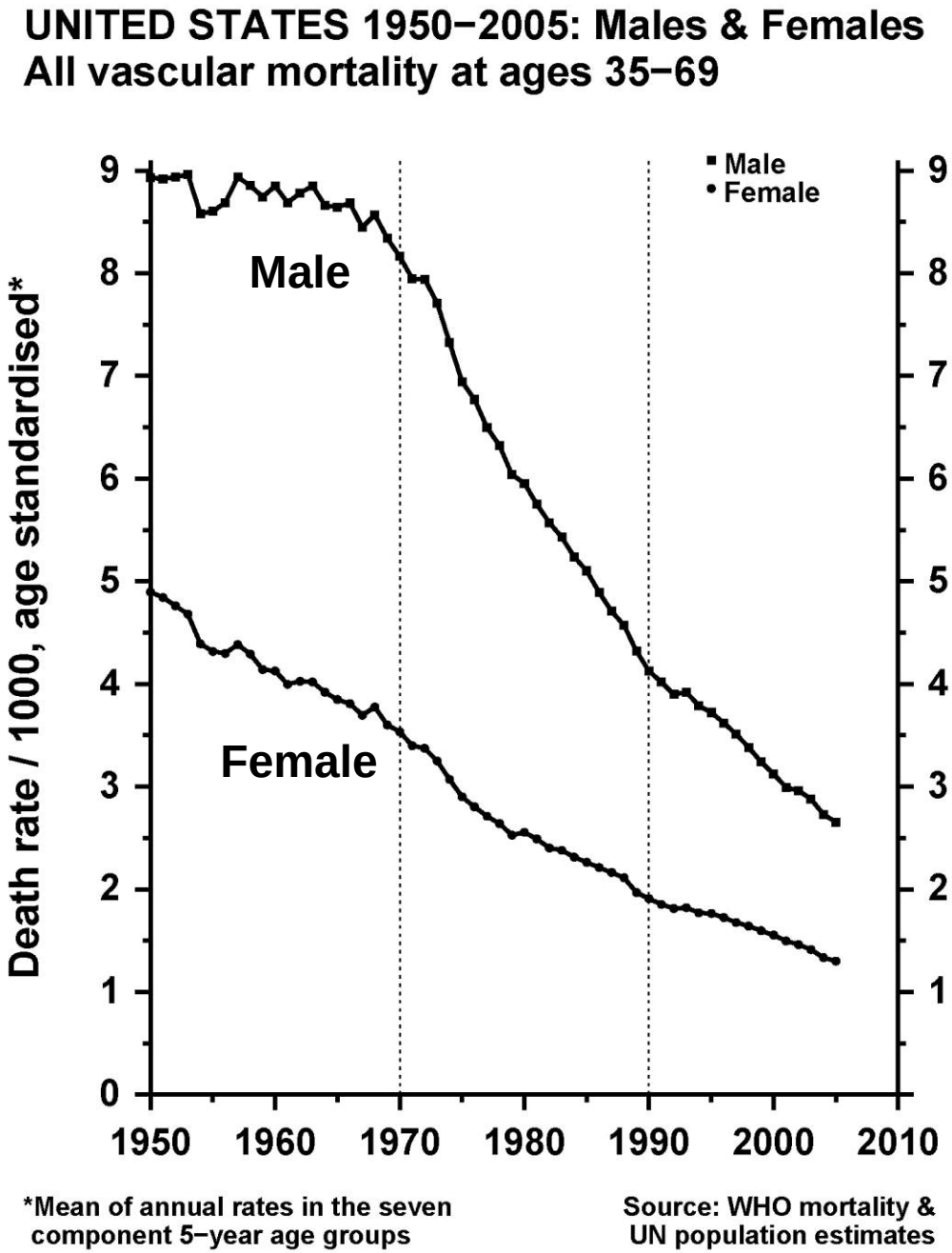
4.5 / 1000 means 15% vasc. death at ages 35-69



Vascular death at ages 35-69: 7% male, 3% female

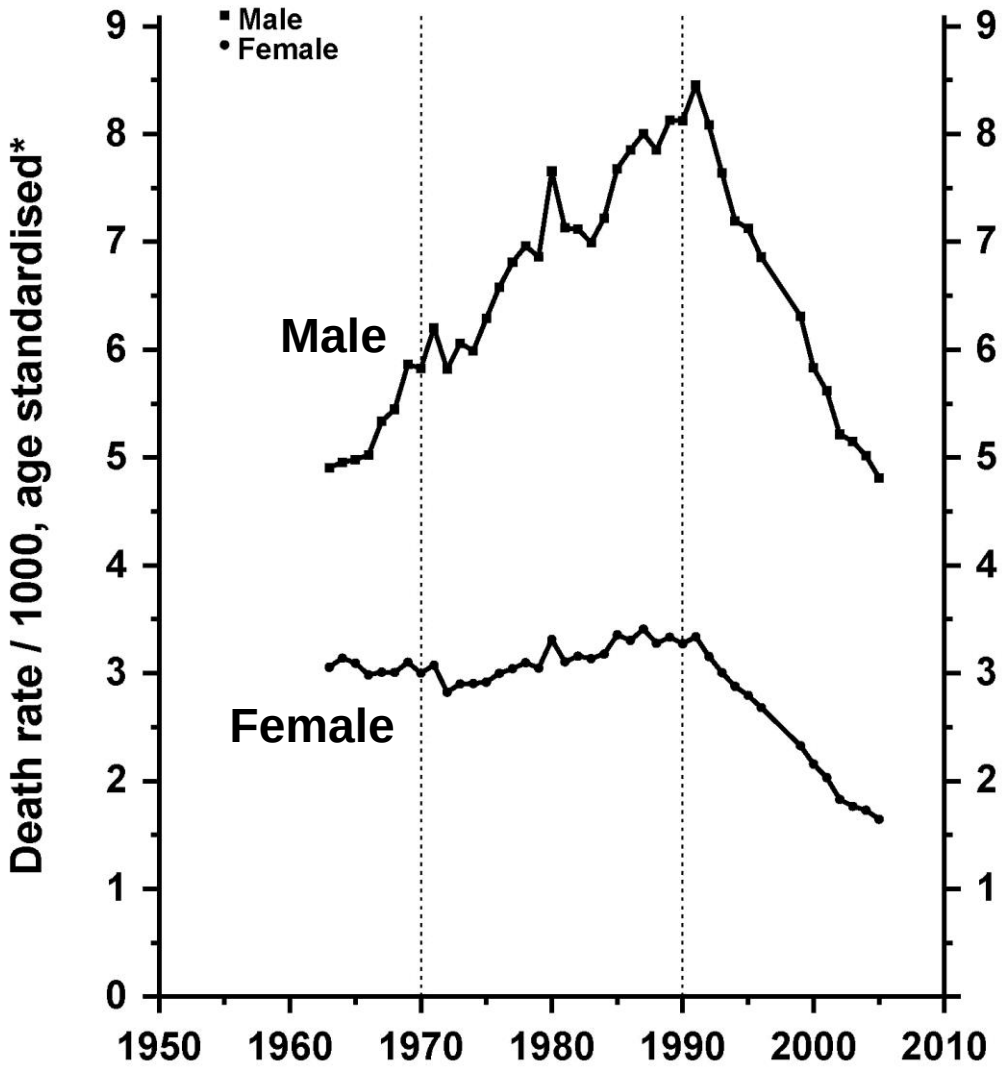
*Mean of annual rates in the seven component 5−year age groups

Source: WHO mortality & UN population estimates



Vascular death at ages 35-69:
9% male,
4% female

POLAND 1963−2005: Males & Females
All vascular mortality at ages 35−69



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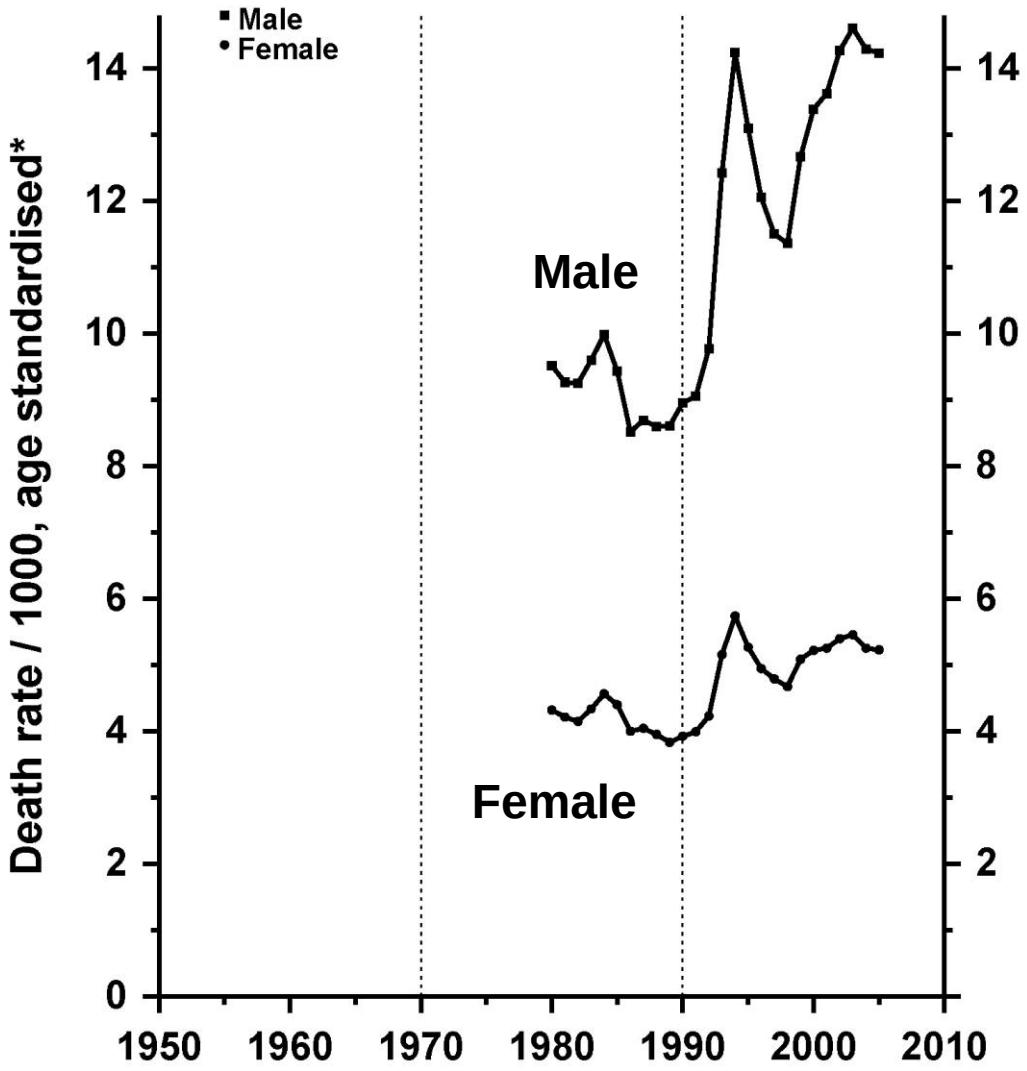
Source: WHO mortality & UN population estimates

RUSSIAN FEDN. 1980−2005: Males & Females
All vascular mortality at ages 35−69



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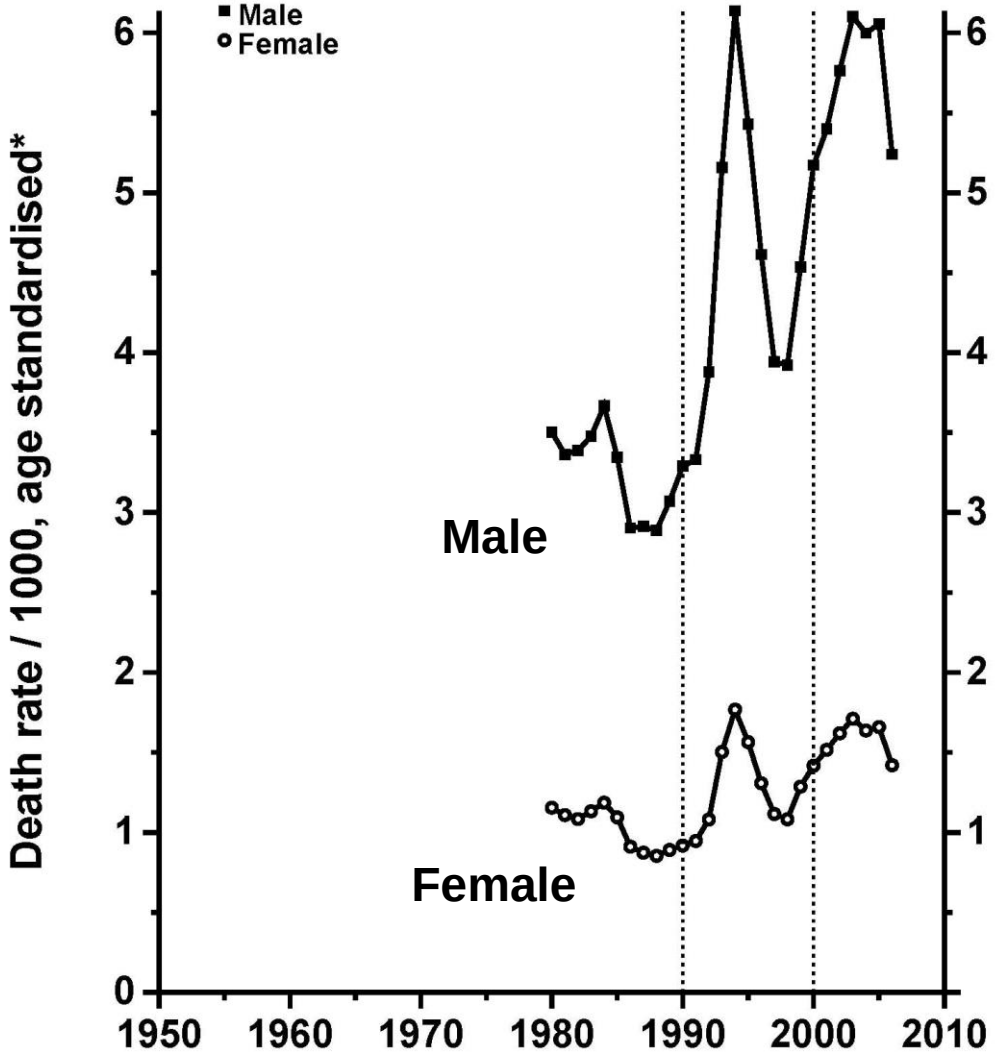


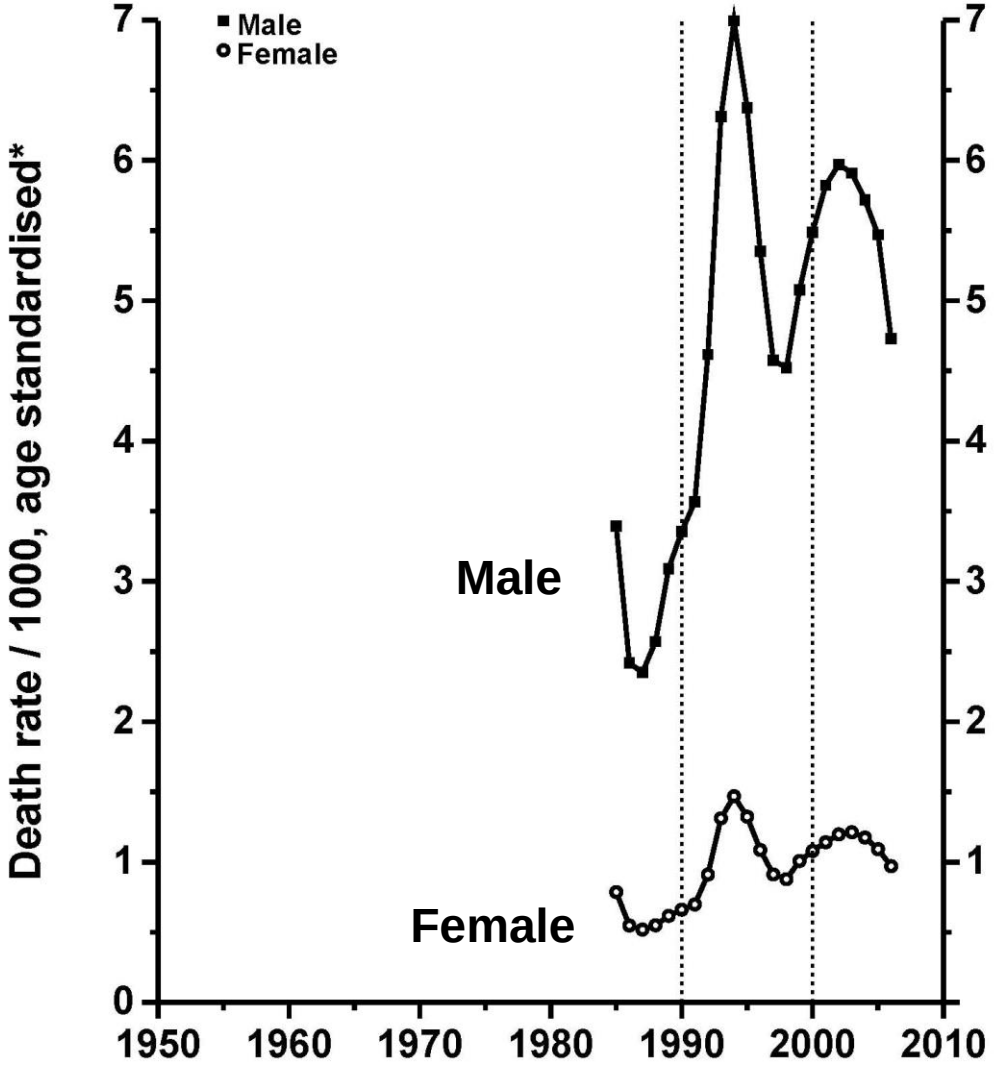
*Mean of annual rates in component 5−year age groups

Source: WHO mortality & UN population estimates

The large <u>apparent</u> fluctuations in Russian vascular mortality

may be due mainly to fluctuations in alcoholic heart damage or poisoning <u>mis-certified</u> as vascular disease

RUSSIAN FEDN. 1985−2006: Males & Females
Non−medical causes mortality at ages 35−54



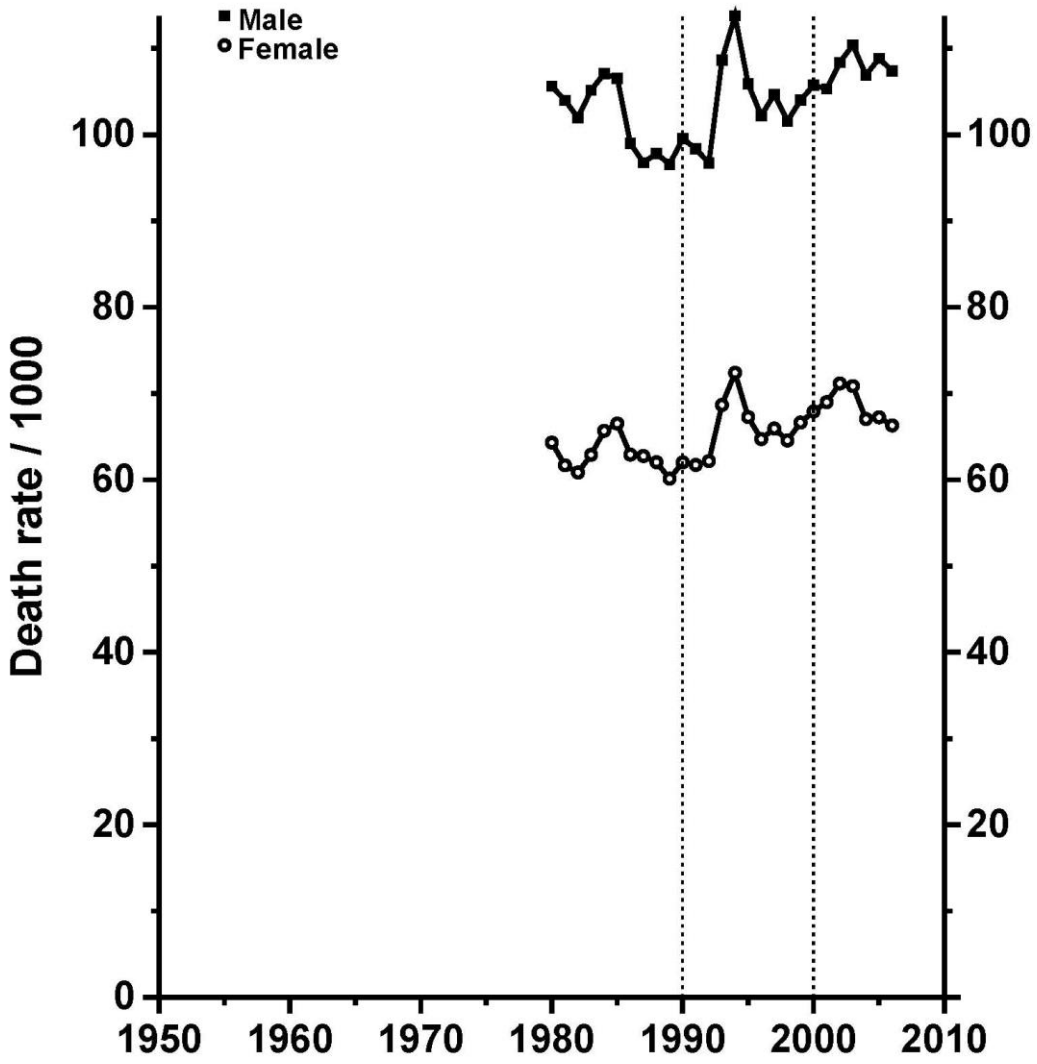
*Mean of annual rates in component 5−year age groups

Source: WHO mortality & UN population estimates

Russia, 1988-94: adverse trends in mortality are NOT seen for

- lung cancer mortality
- other cancer mortality
- childhood mortality (0-4)
- mortality in old age (75-9)

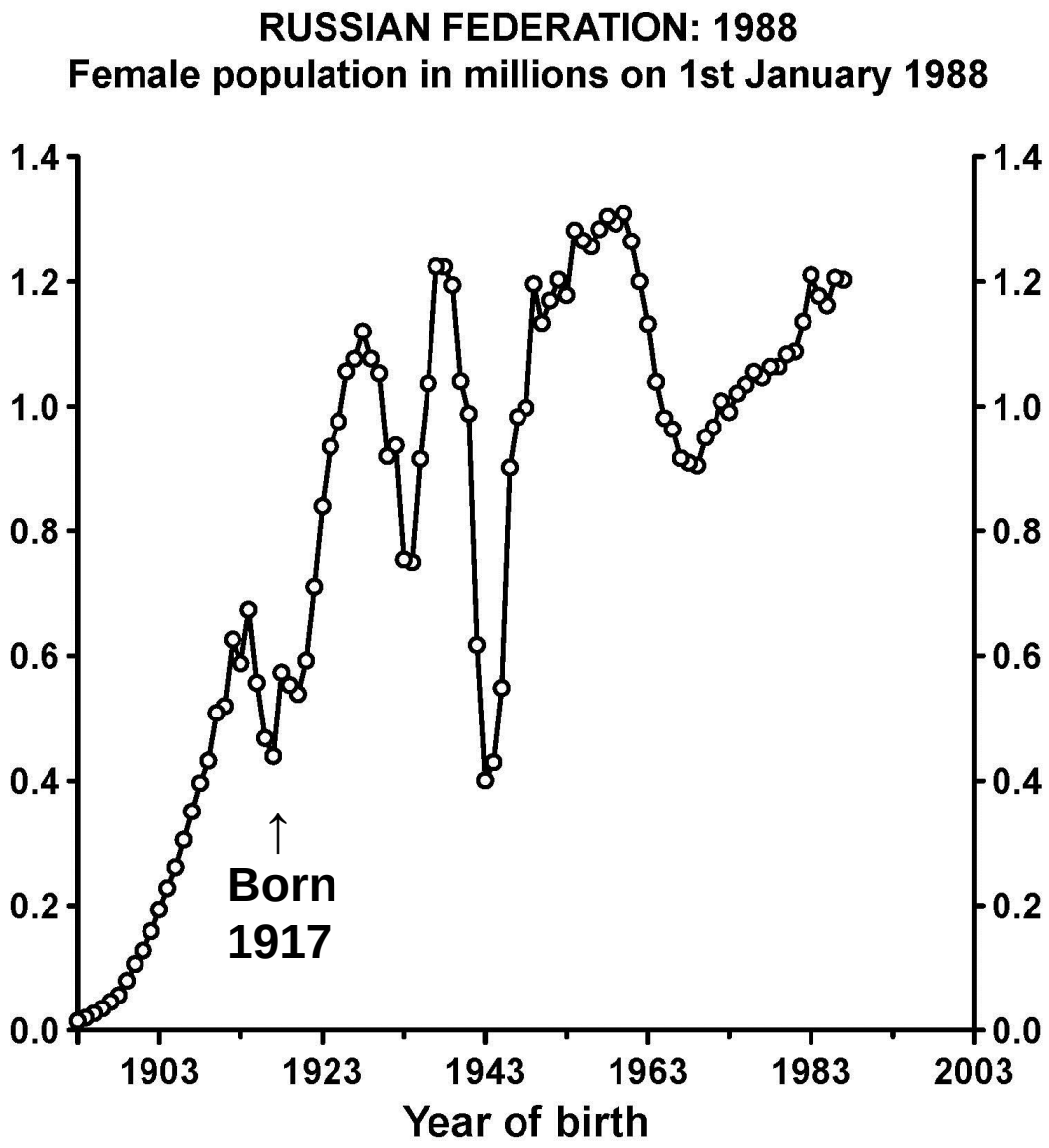
RUSSIAN FEDN. 1980−2006: Males & Females
All cause mortality at ages 75−79



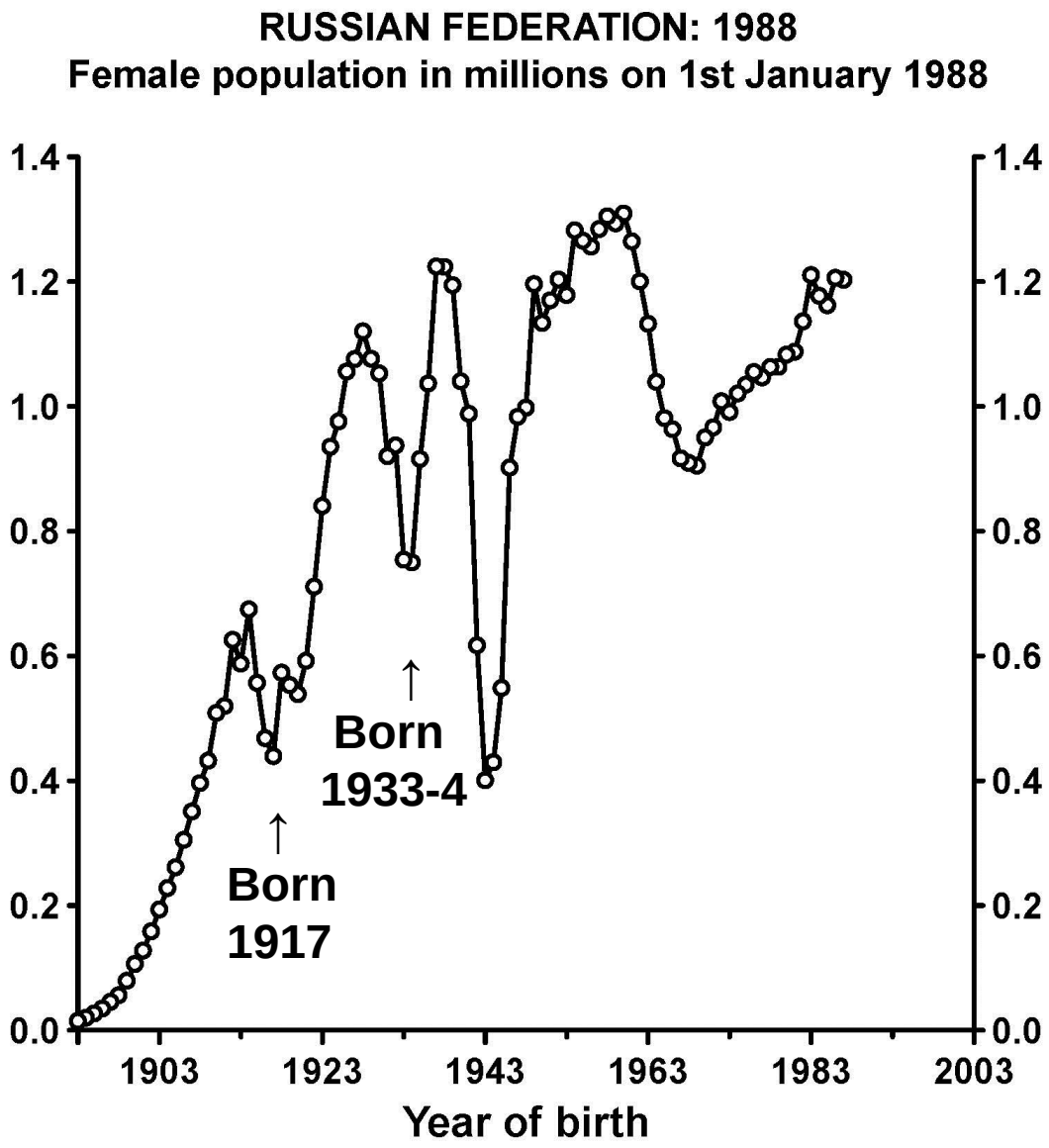
Source: WHO mortality &
UN population estimates

Frozen social history: Russian Federation in 1988 and in 2003

Female population by birth year



Source: Human Mortality Database
www.mortality.org



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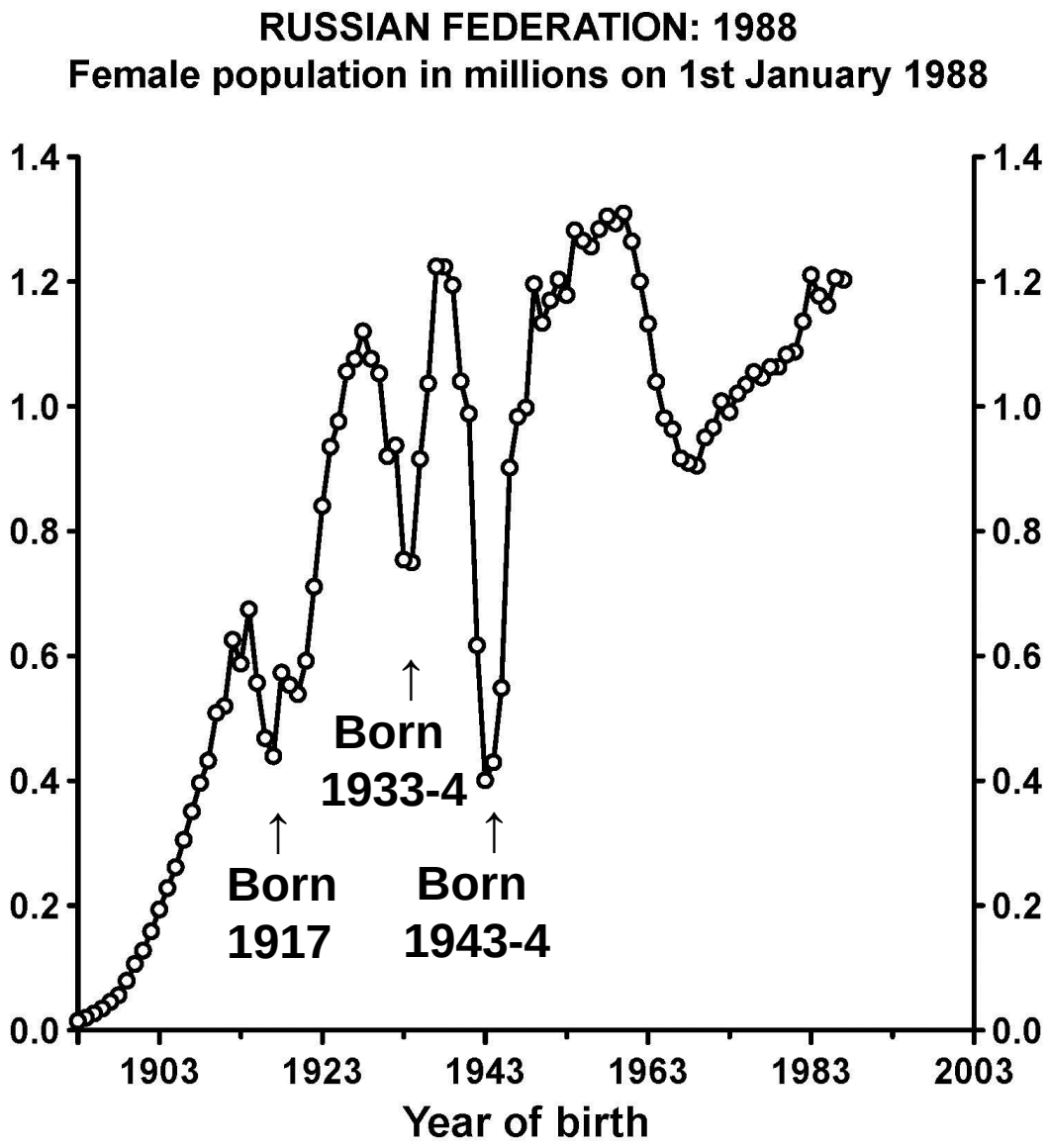

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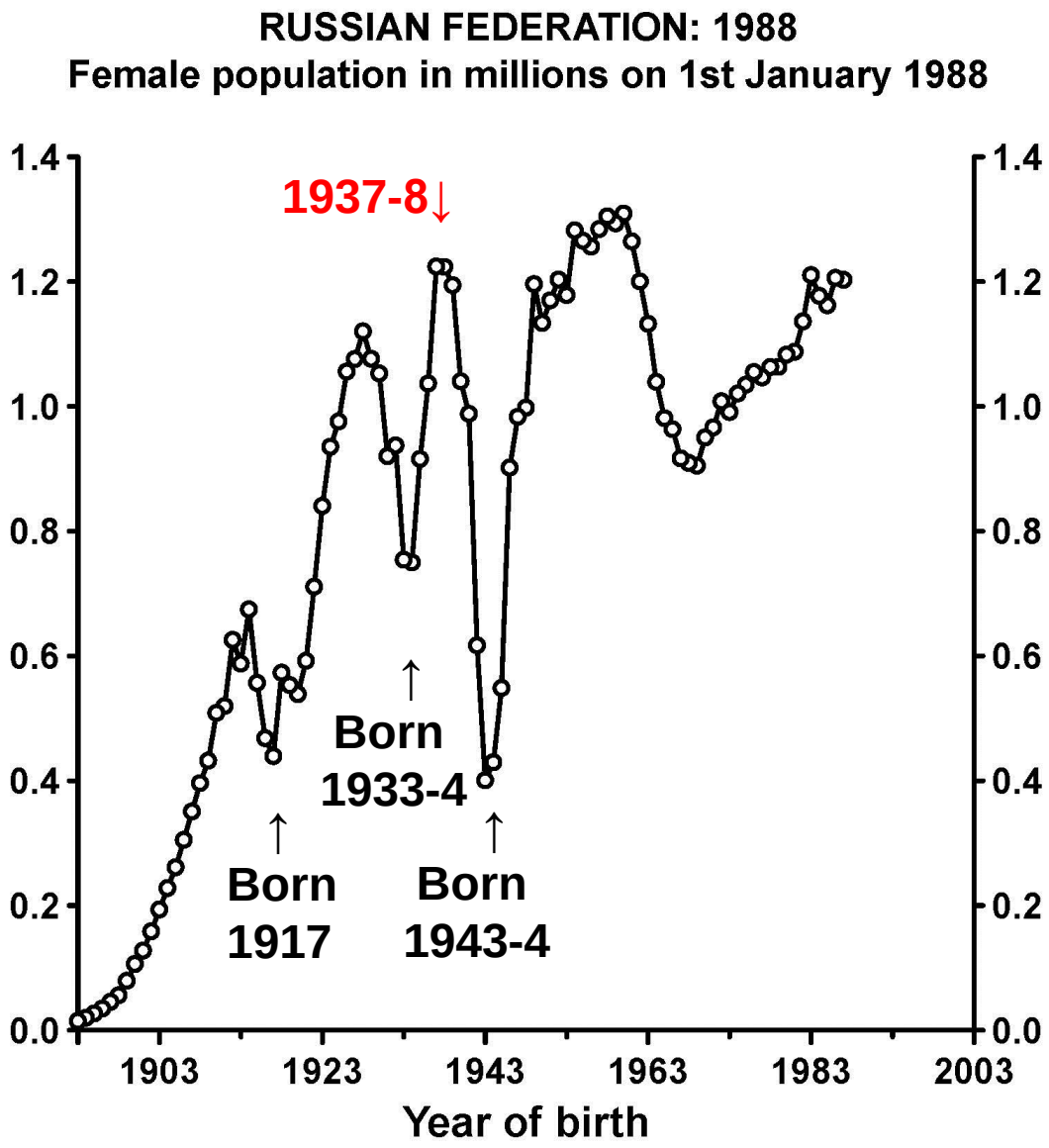

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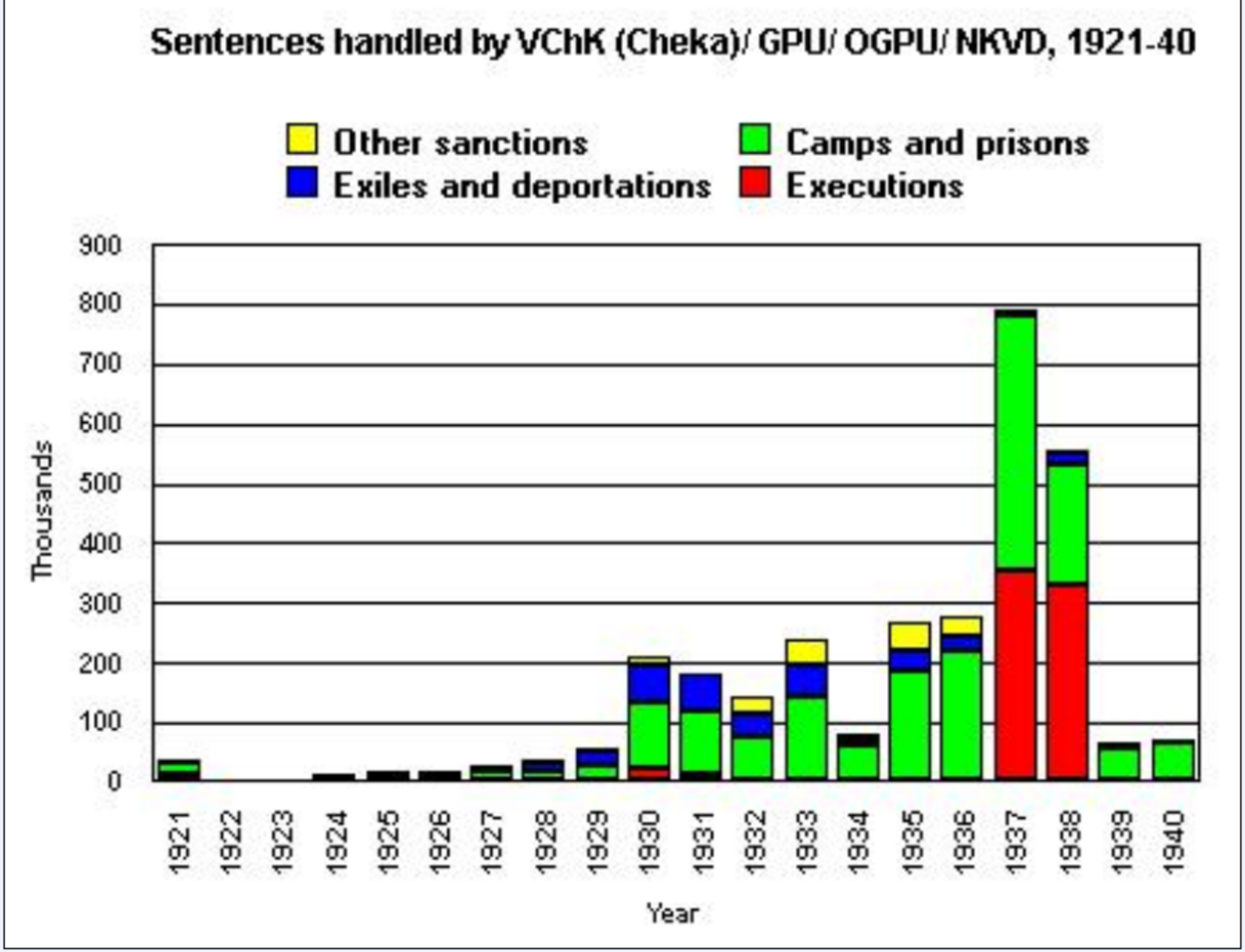
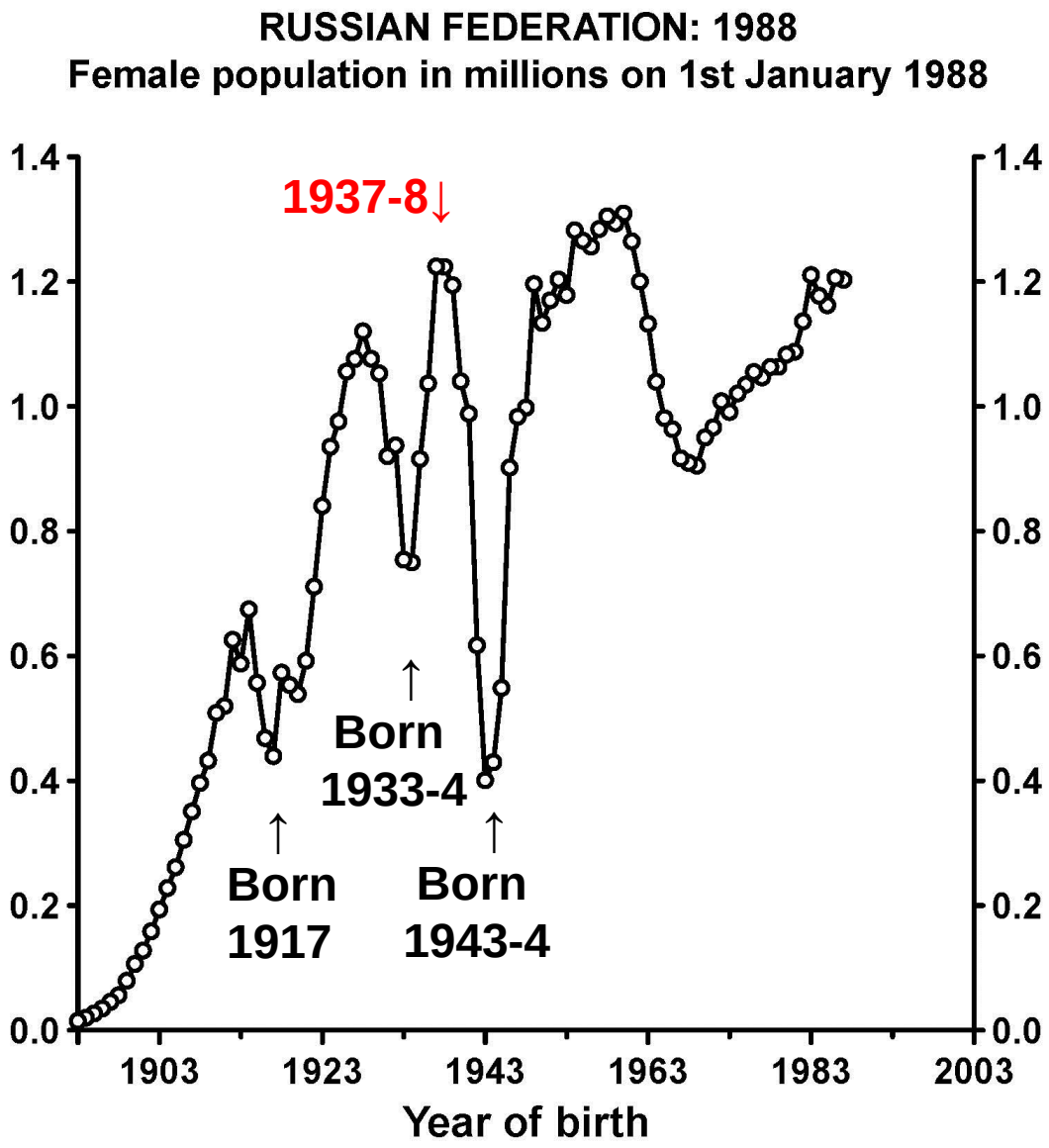
1953 Russian secret police report to new Soviet leadership just after Stalin died:

numbers each year between 2 world wars they had exiled, imprisoned or executed

Great Terror, 1937-8: 700,000 executed


Sentences handled by VChK (Cheka)/ GPU/ OGPU/ NKVD, 1921-40
Other sanctions
Camps and prisons
Exiles and deportations
Executions
Thousands
900
800
700
600
500
400
300
200
100
0
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940
Year



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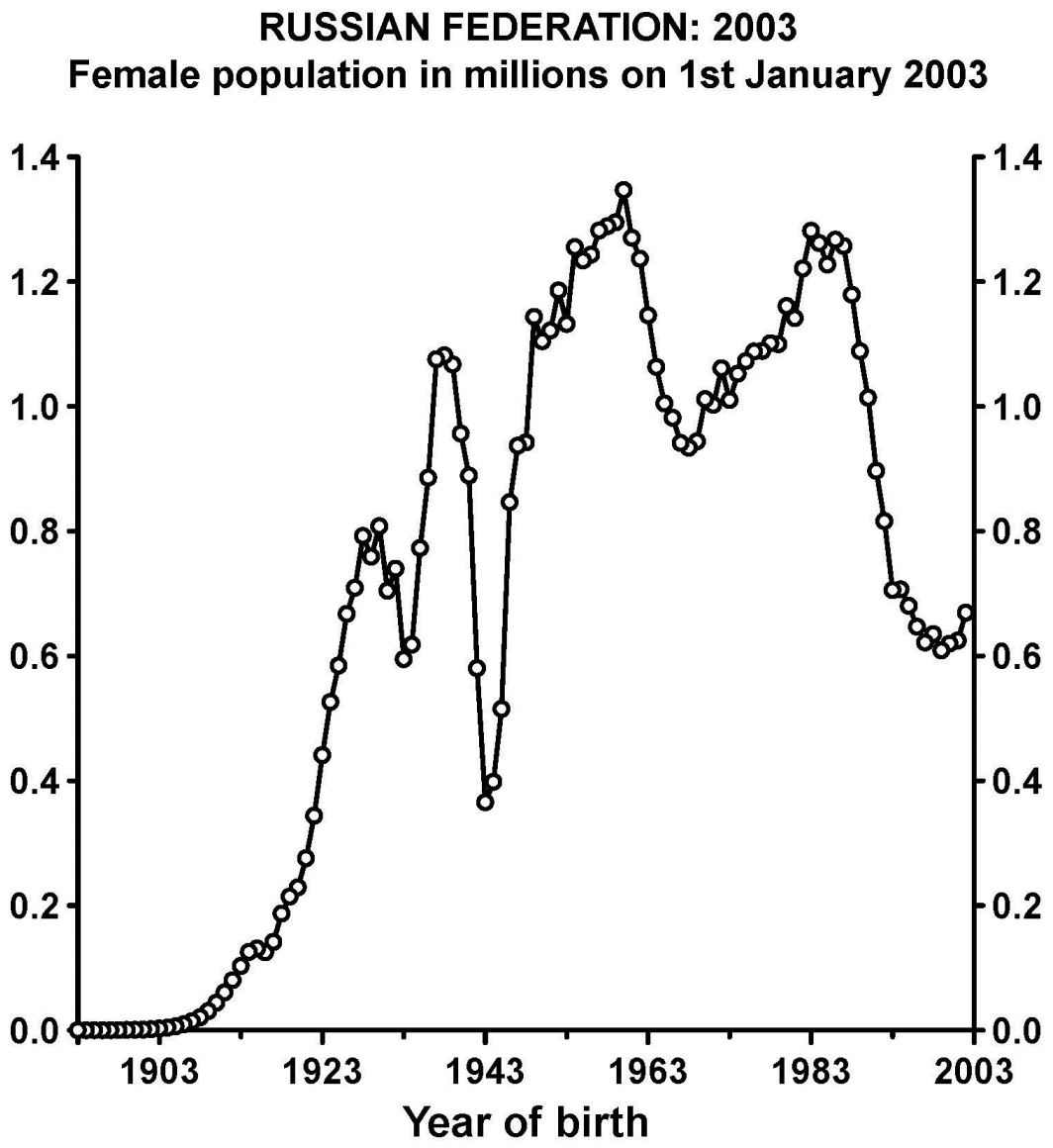

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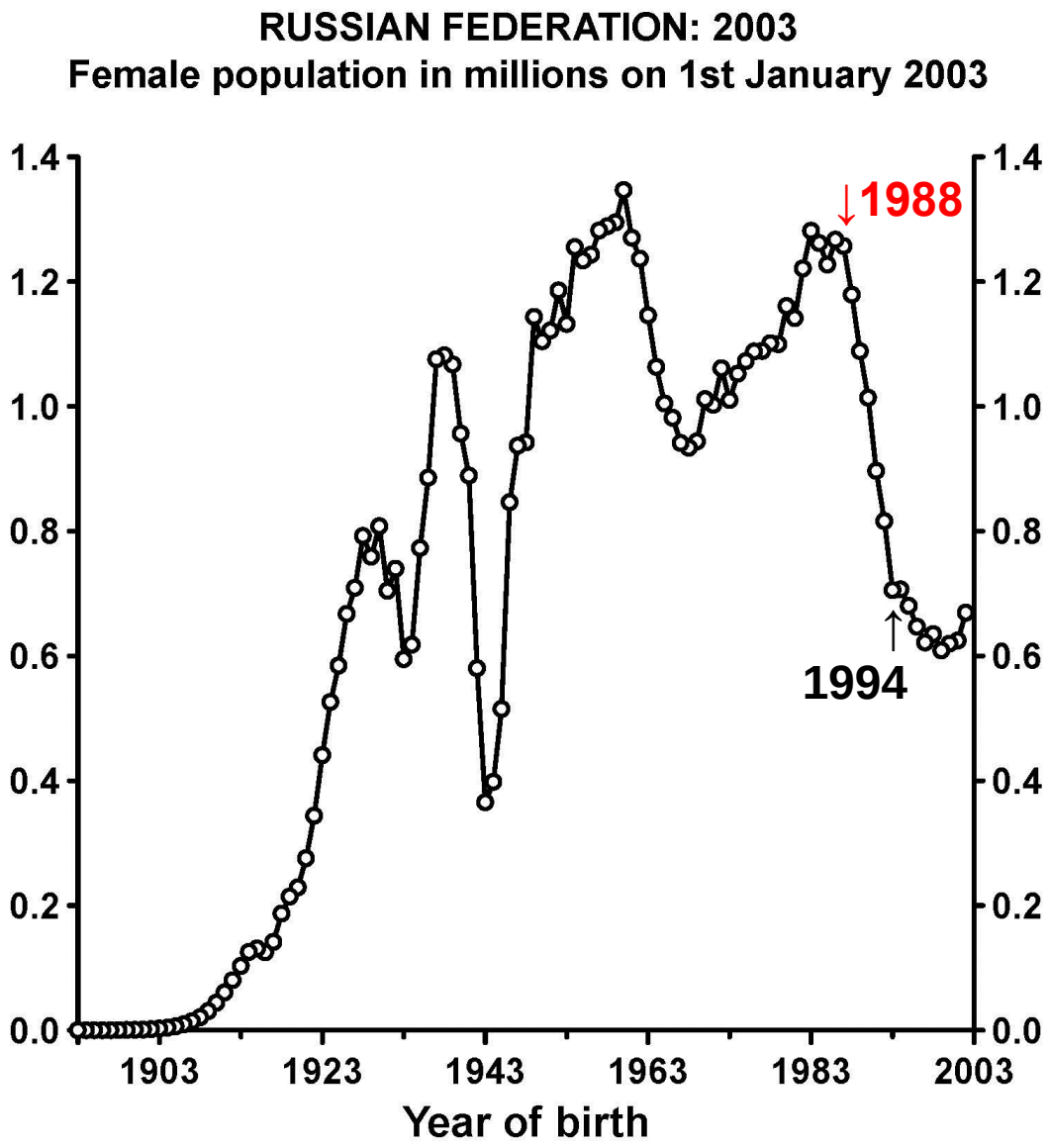

Source: Human Mortality Database
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Russia, destructive consumption of alcohol and <u>all-cause</u> mortality

at ages 15-34, 35-54 and 55-74

Lancet 2009; 373: 2201

Visit, in 2001-5, addresses of 60K deaths at ages 15-74 in 1990-2001 in 3 typical cities

For 50K deaths (30K men, 20K women), find family still there; interview 97% about smoking & drinking habits of deceased

Controls: 5.5K of these deaths that were from diseases we thought unlikely to be much related to smoking or drinking

Lancet 2009; 373: 2201

B=0.5 litre bottle of vodka (20 UK shots)

Habits of ever-drinkers (few "never"):
Reference:<0.5B/week <u>&</u> not 0.5 B/binge
Other drinkers: <1, 1-3, 3+ B/week

Get RR for <u>top vs reference</u> category
(NB mean in top category = 5-6 B/week, ie, about 1 bottle of vodka per day)

Lancet 2009; 373: 2201

8 selected diseases: RRs, men drinking ~1 bottle of vodka/day vs reference men

2.1 x liver cancer
3.5 x upper aerodigestive cancer
3.3 x pneumonia
4.1 x respiratory TB
6.2 x liver disease
6.7 x pancreatic disease
3.0 x non-MI acute IHD
7.7 x ill-specified disease

Aggregate RR=3.8 (3.4-4.1) for all 8 diseases

Aggregate RR=1.4 (1.3-1.5), all other diseases
(eg, RR=1 for lung & for stomach cancer)

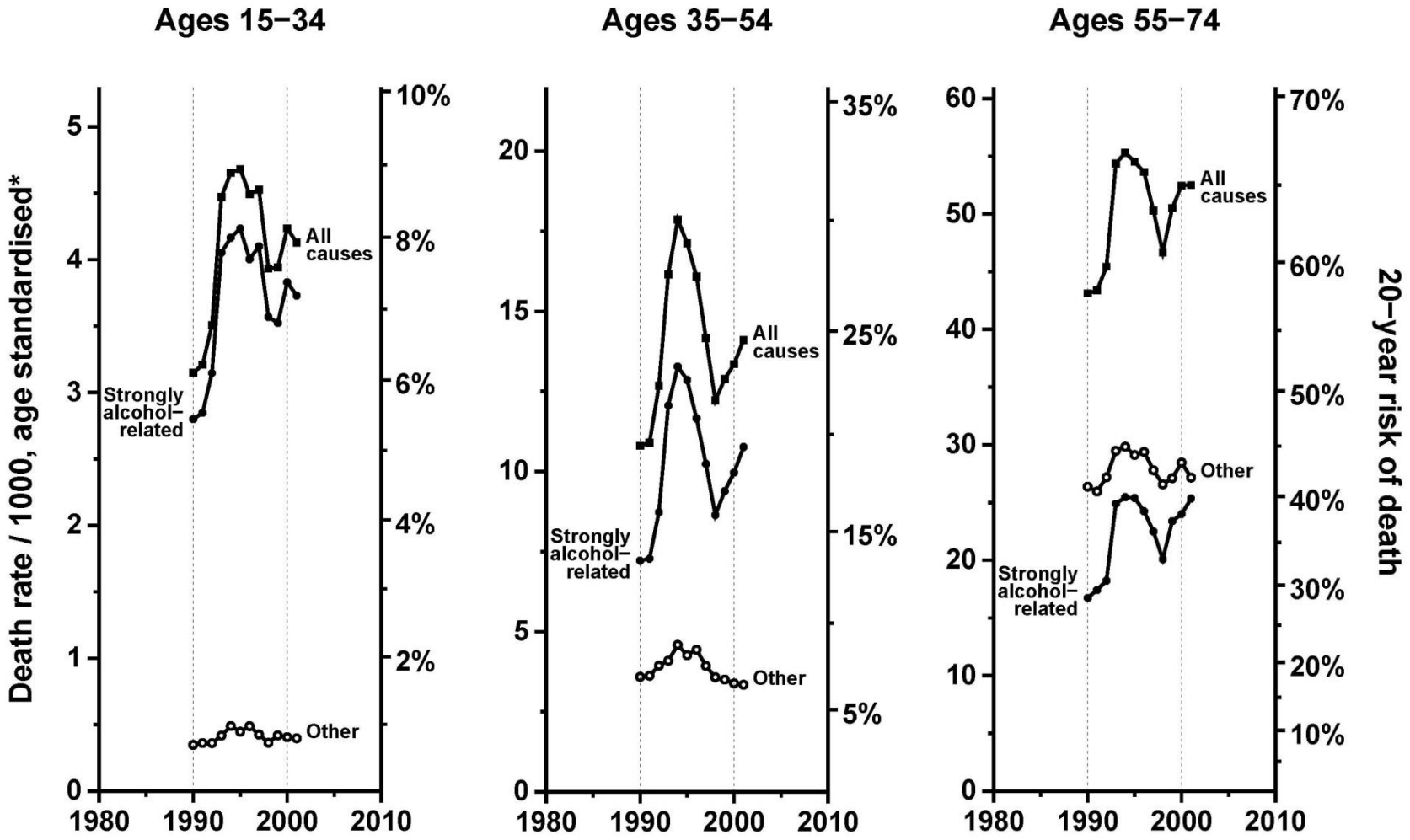
Medical and non-medical causes: RRs, men drinking ~1 bottle of vodka/day vs reference men

2 x any medical cause

4 x road traffic accident
6 x any other accident
8 x suicide
10 x murder

Male mortality in Altay and Tomsk study regions, 1990-2001

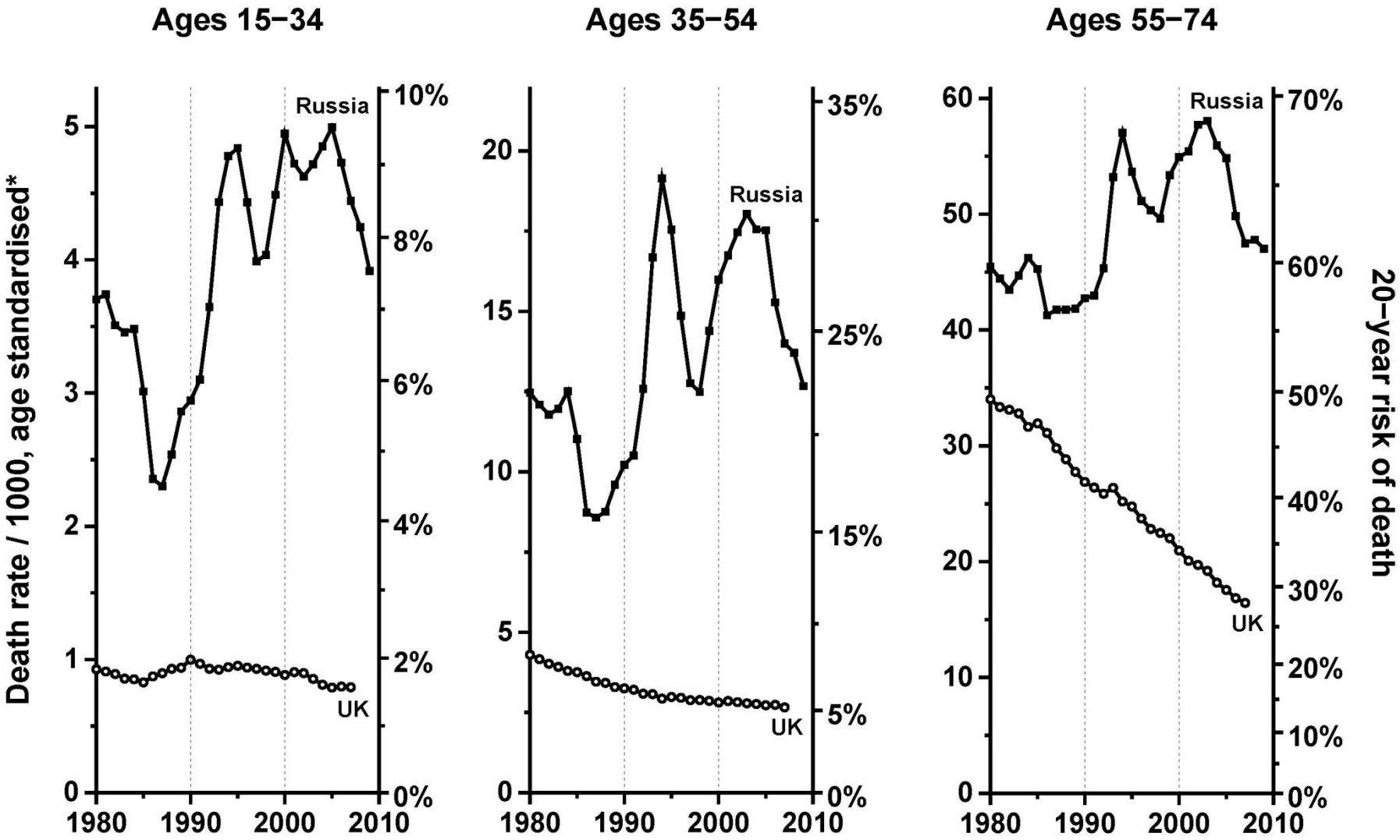
("strongly alcohol-related" = non-medical causes & 8 selected diseases)



*Mean of annual rates in four 5−year age groups

Source: regional mortality & population estimates

All-cause mortality, Russia 1980-2009 and UK (to 2007): males



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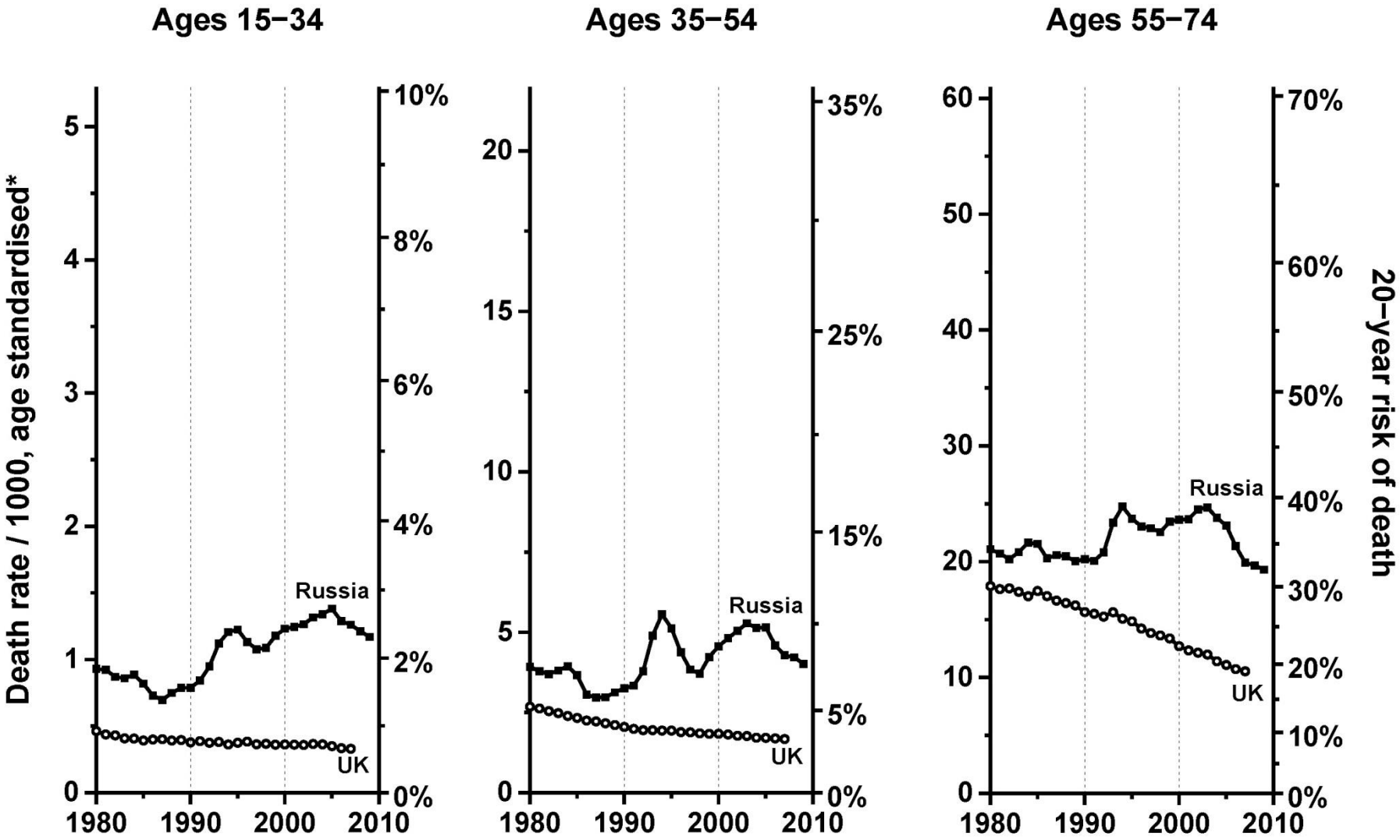
WHO (& 2007−9 ZAGS) mortality and UN population estimates

All-cause mortality, Russia 1980-2009 and UK (to 2007): females



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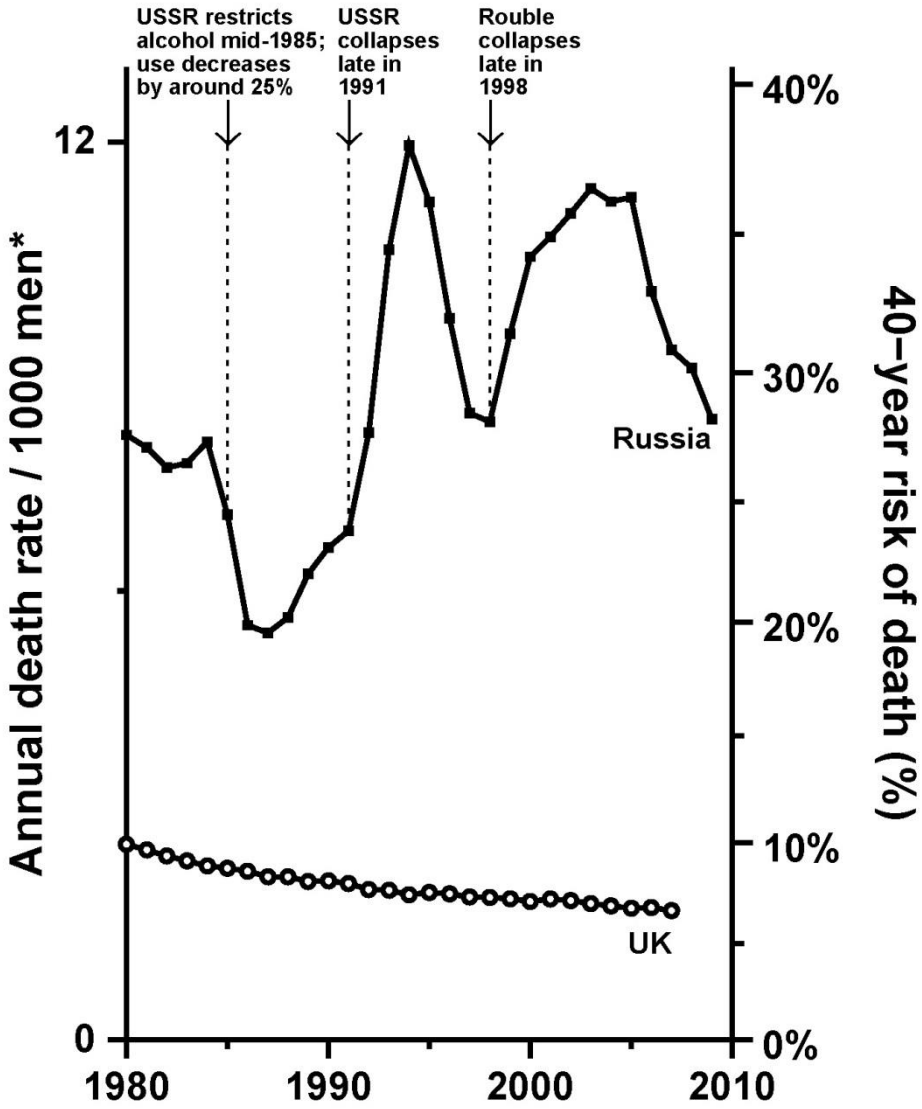
All−cause mortality, males aged 15−54, in Russia 1980−2009 and UK (to 2007)

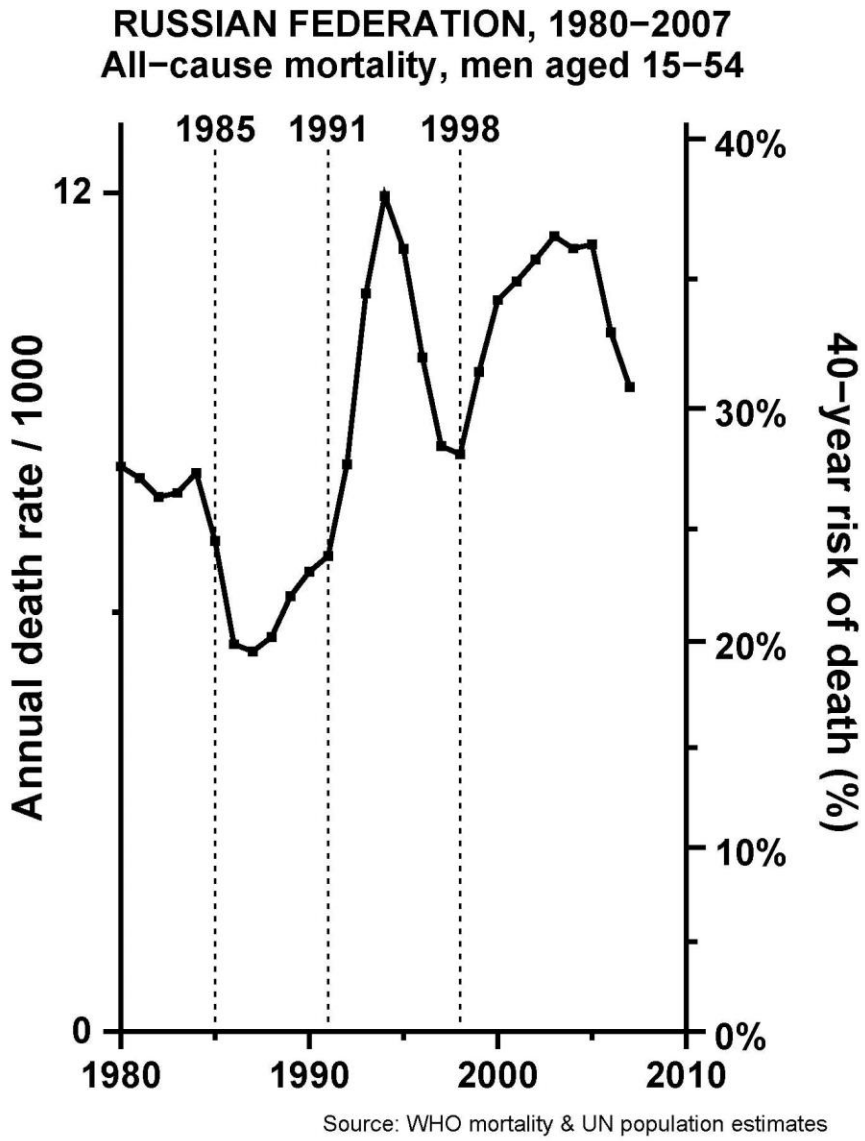


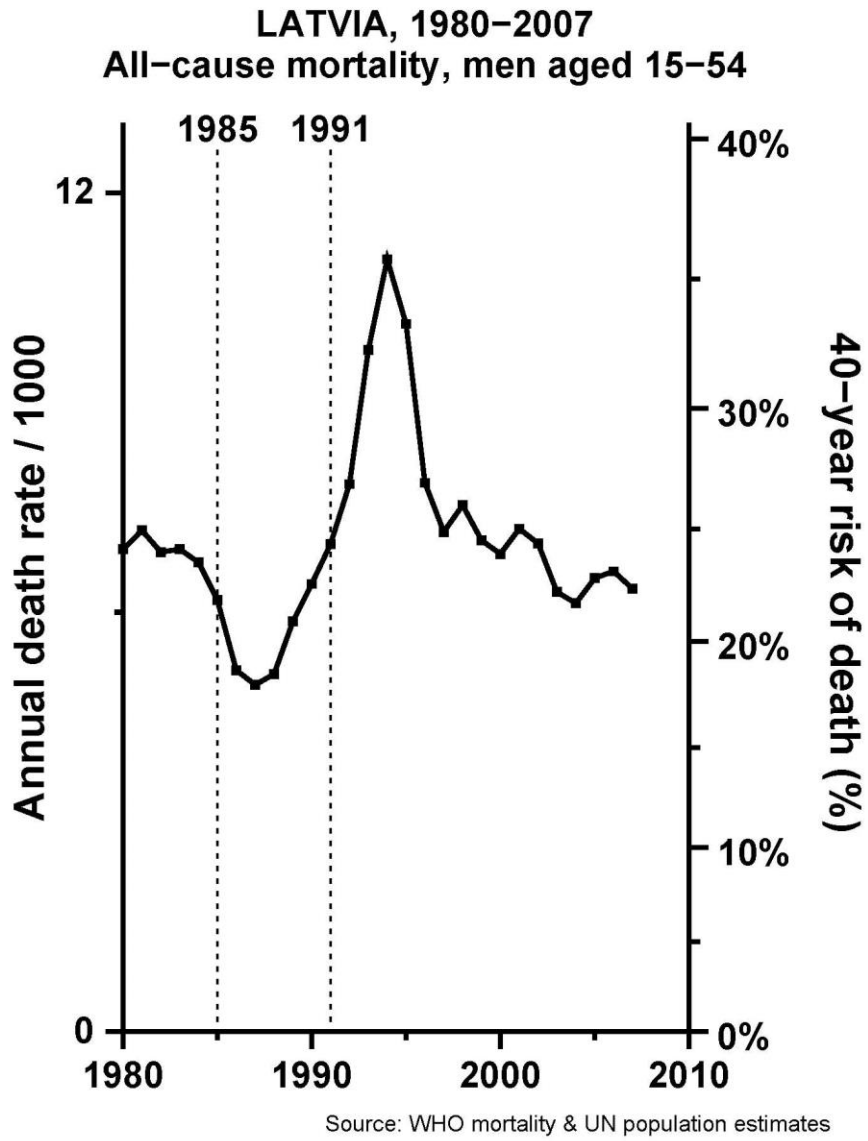
* Mean of rates in component 5−year age groups (15−19 to 50−54 years)

WHO (& 2007−9 ZAGS) mortality and UN population estimates

Alcohol is the main cause of the high rates and rapid fluctuations of premature adult mortality in Russia

What about the rest of the former USSR?


RUSSIAN FEDERATION, 1980−2007
All−cause mortality, men aged 15−54
1985
1991
1998
12
0
Annual death rate / 1000
40%
30%
20%
10%
0%
40−year risk of death (%)
1980
1990
2000
2010
Source: WHO mortality & UN population estimates


LATVIA, 1980−2007
All−cause mortality, men aged 15−54
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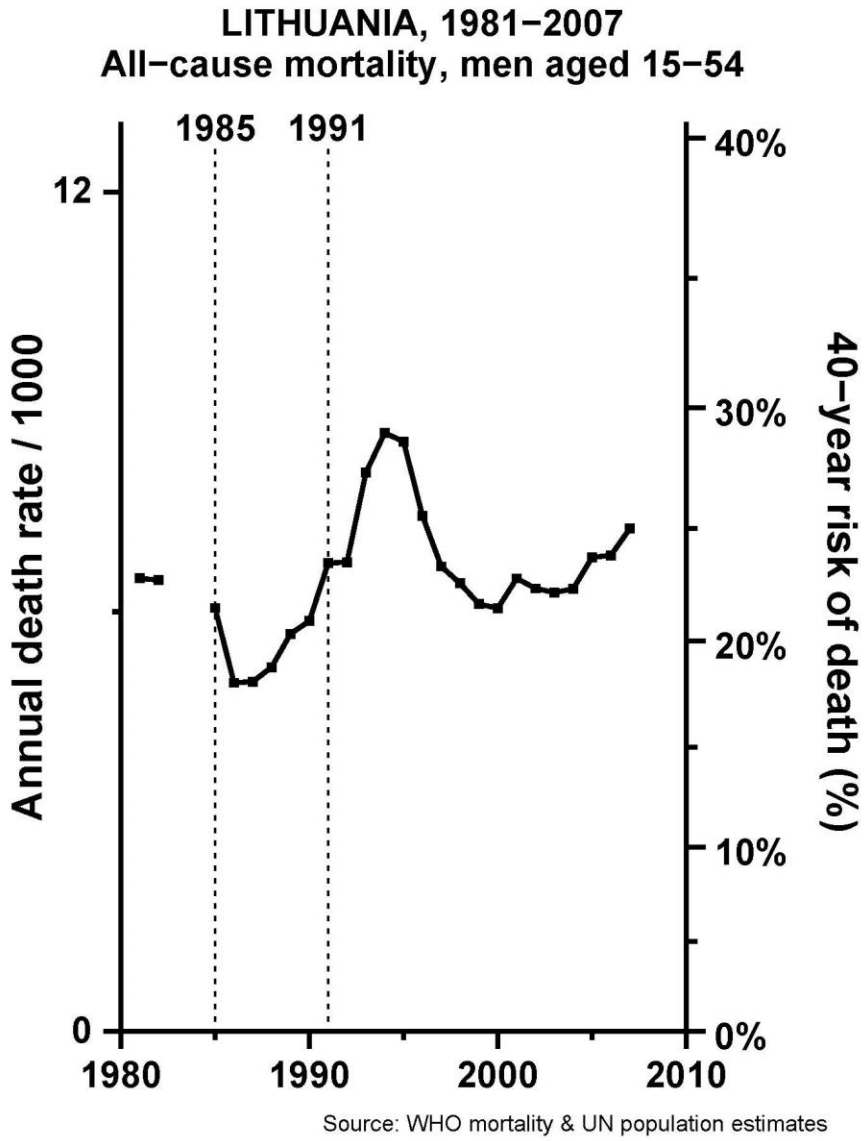
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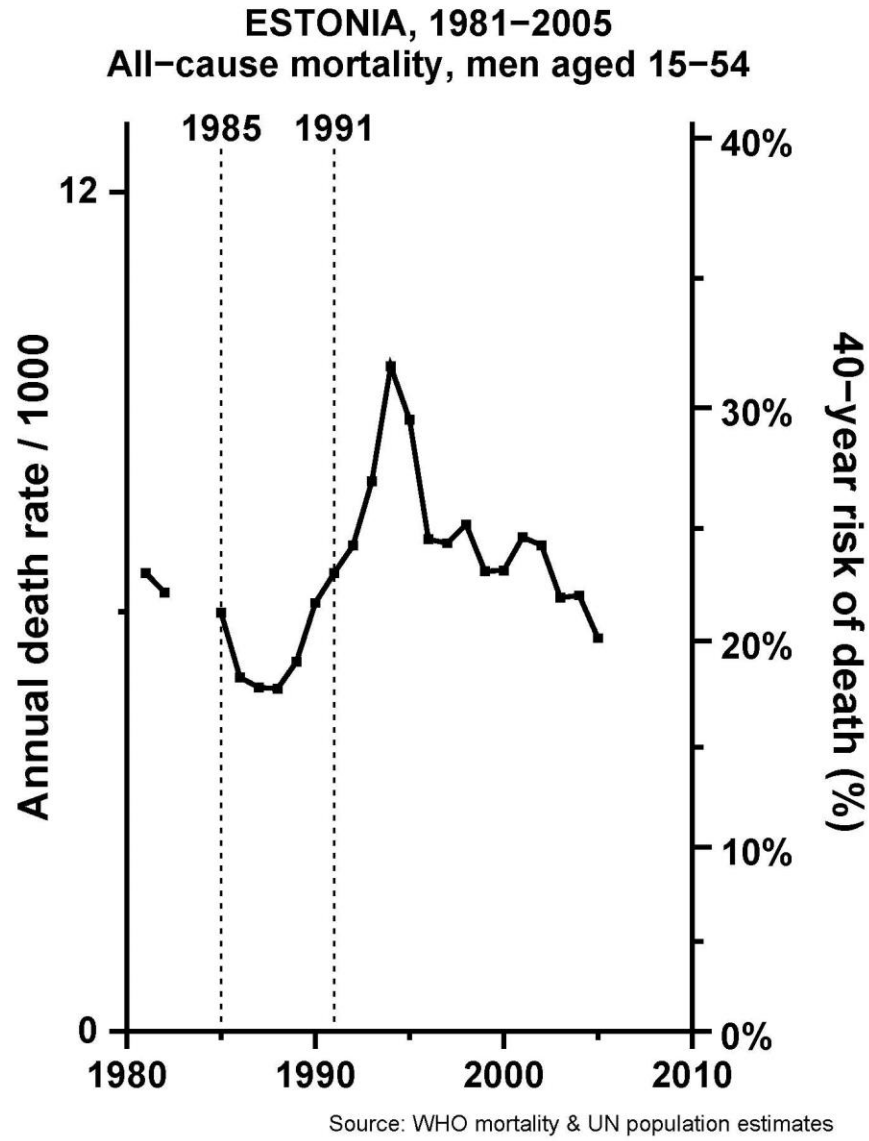
ESTONIA, 1981−2005
All−cause mortality, men aged 15−54
1985
1991
12
0
Annual death rate / 1000
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40−year risk of death (%)
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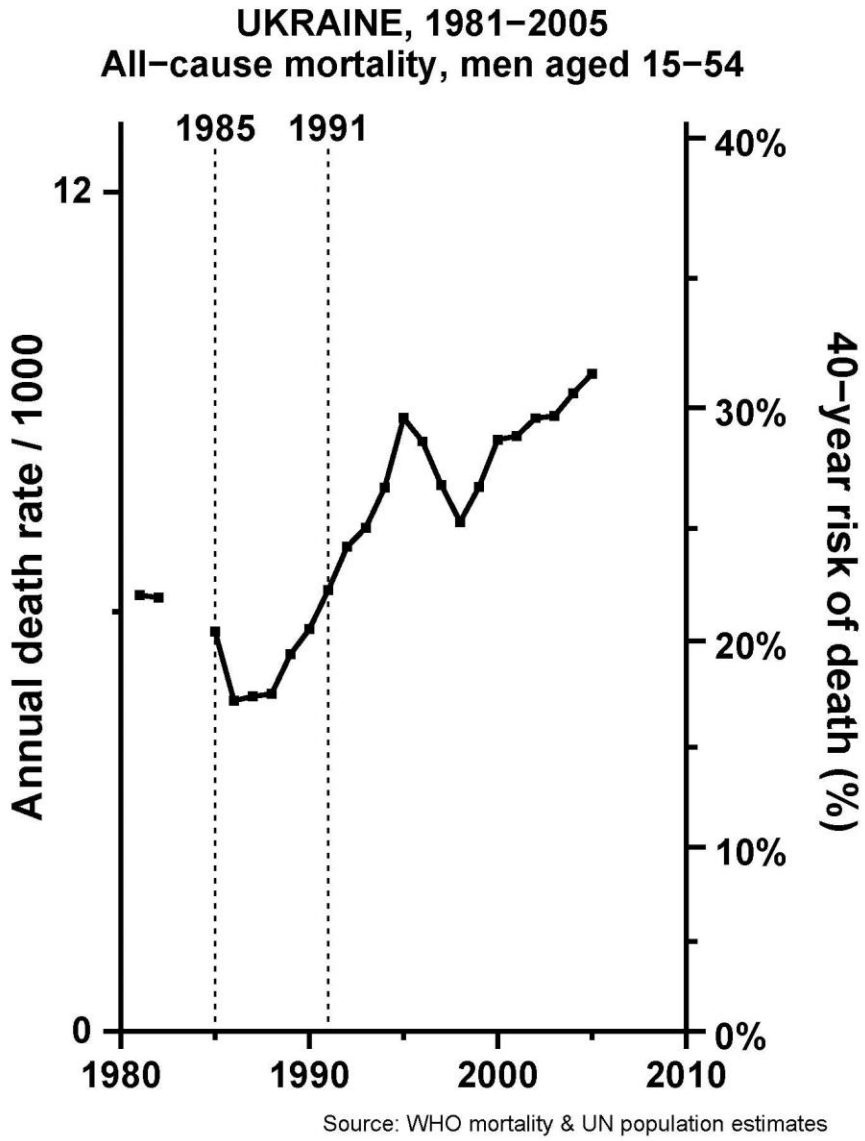
2010
Source: WHO mortality & UN population estimates


UKRAINE, 1981−2005
All−cause mortality, men aged 15−54
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40−year risk of death (%)
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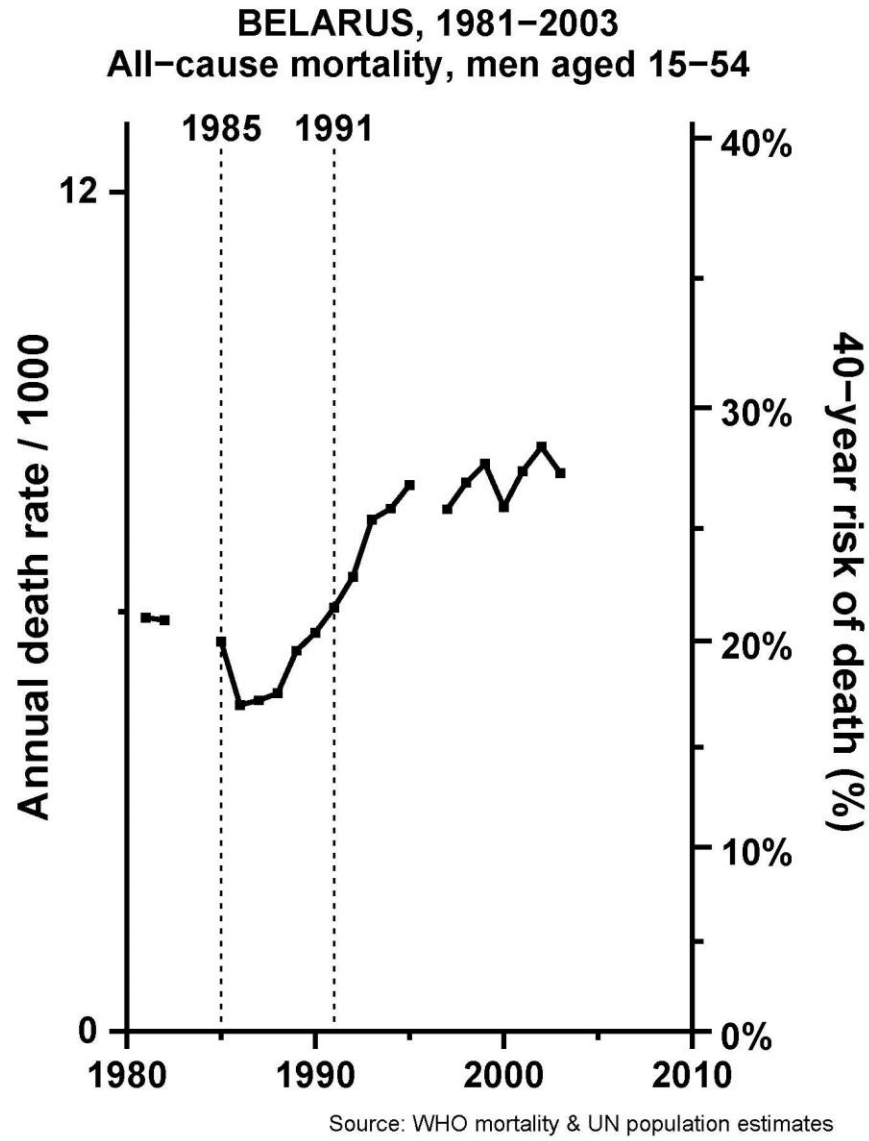
2010
Source: WHO mortality & UN population estimates


BELARUS, 1981−2003
All−cause mortality, men aged 15−54
1985
1991
12
0
Annual death rate / 1000
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0%
40−year risk of death (%)
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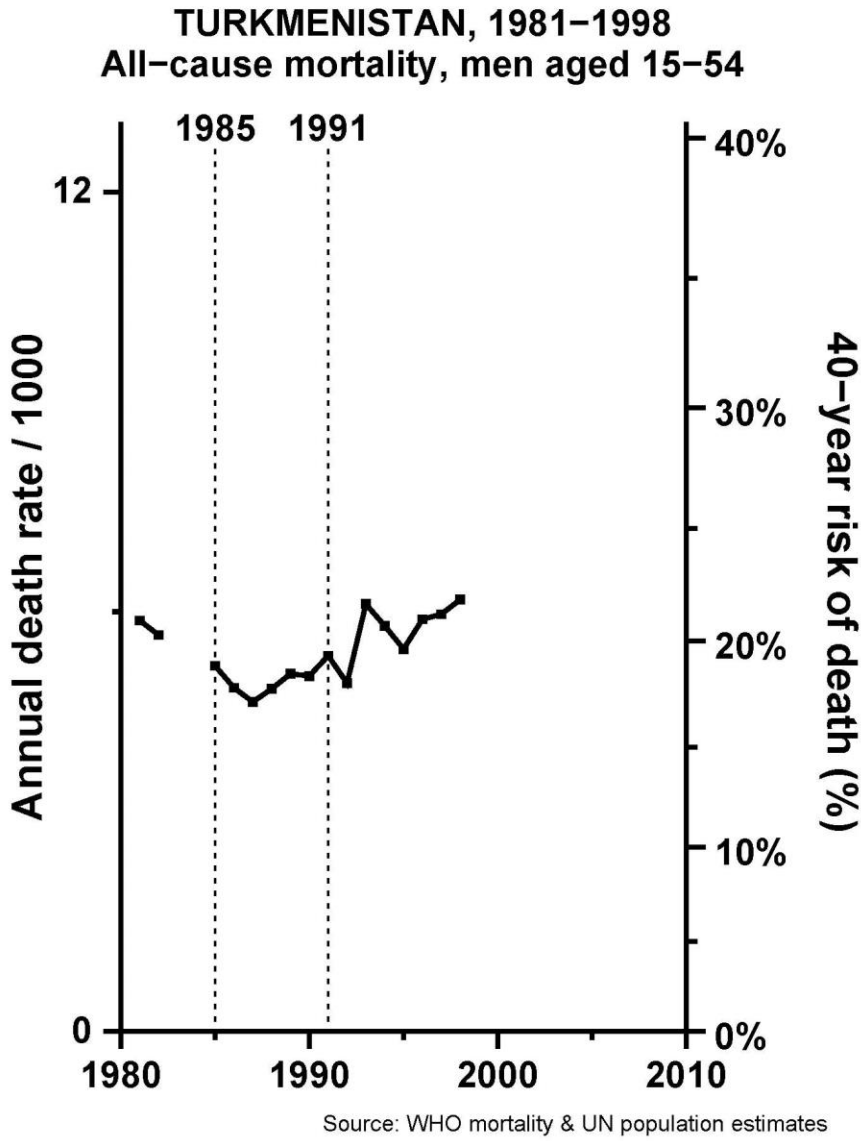
2010
Source: WHO mortality & UN population estimates


TURKMENISTAN, 1981−1998
All−cause mortality, men aged 15−54
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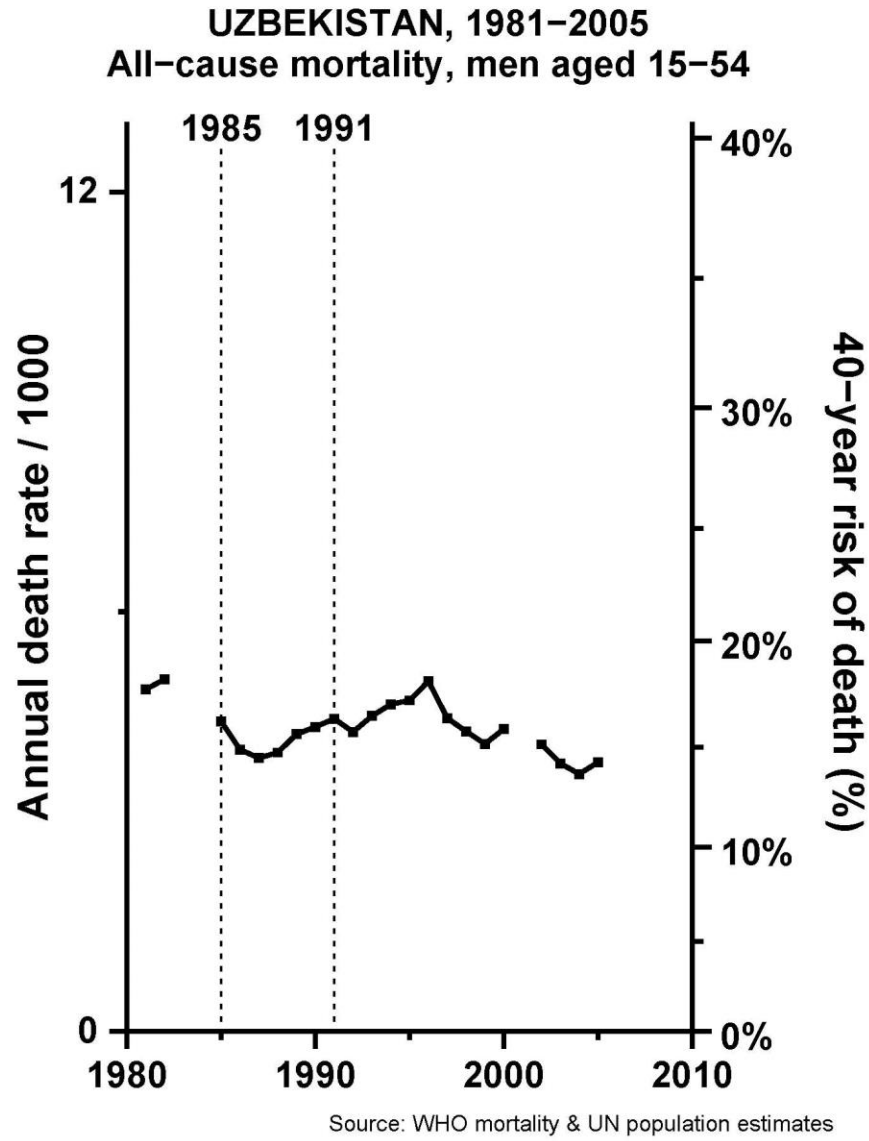
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All−cause mortality, men aged 15−54
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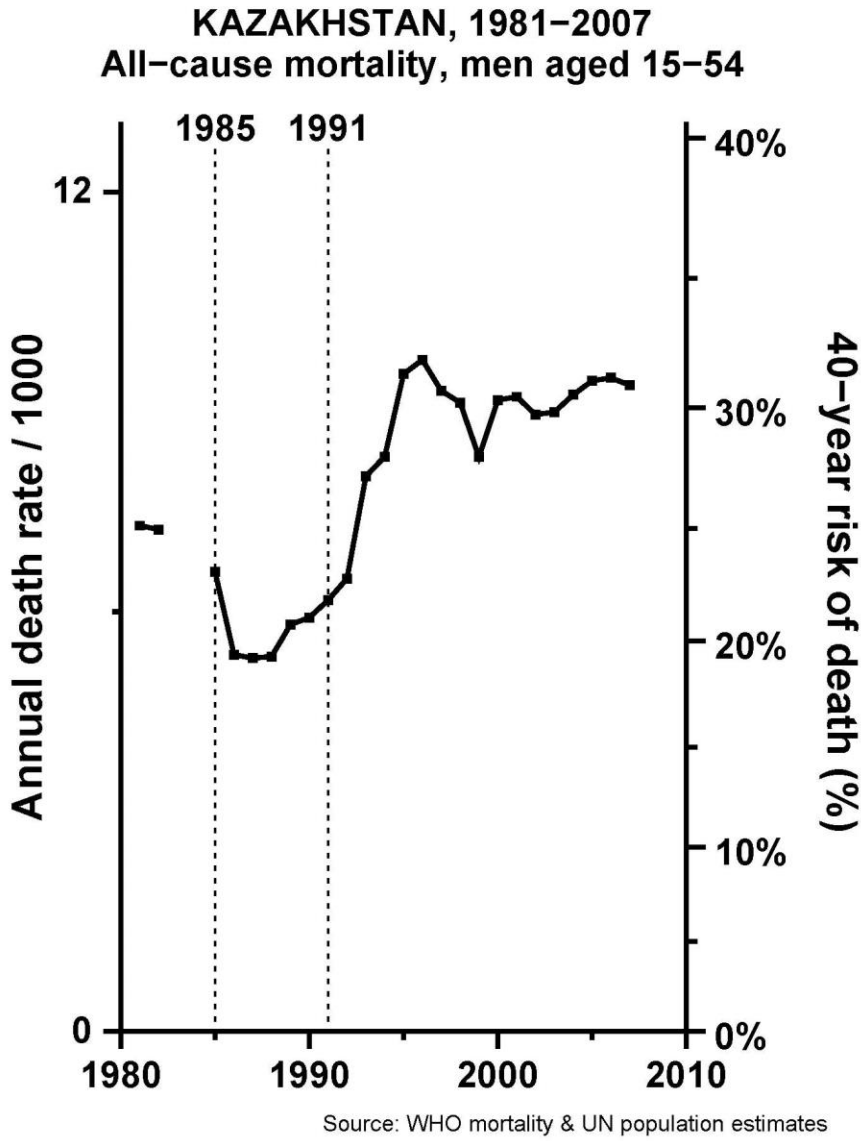
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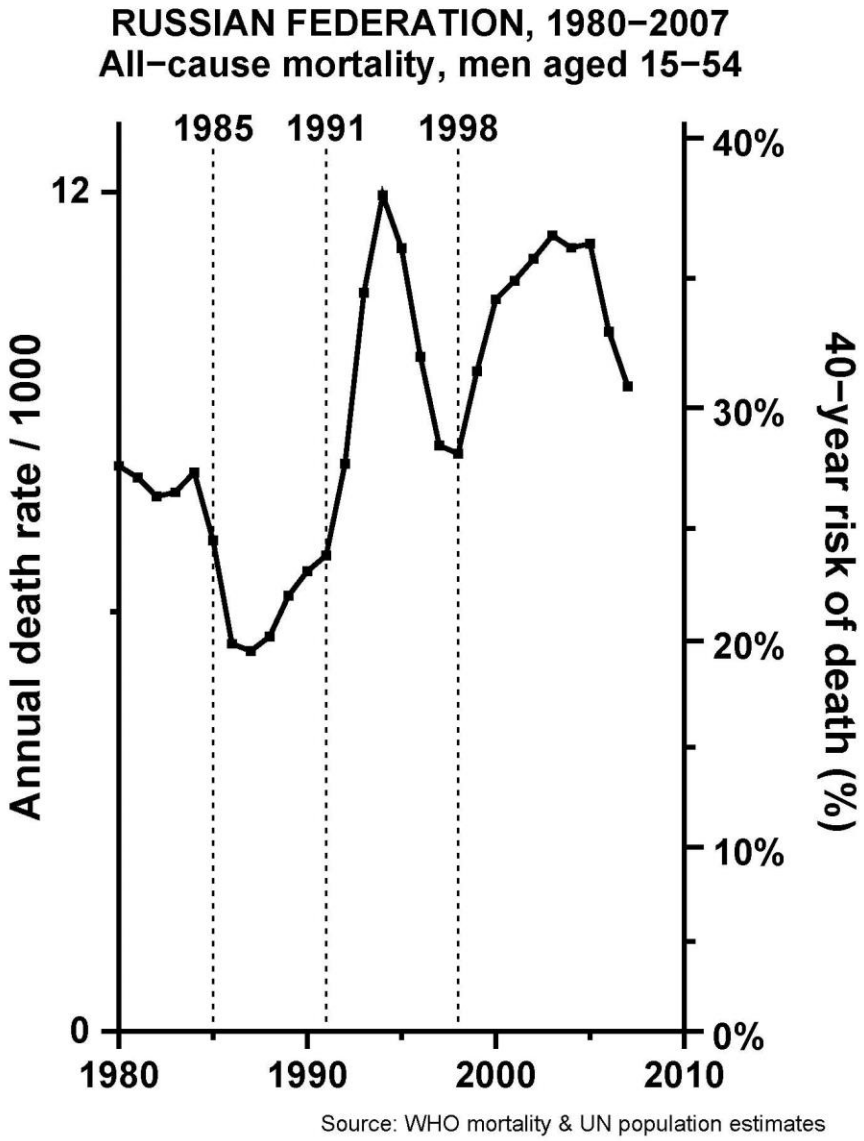
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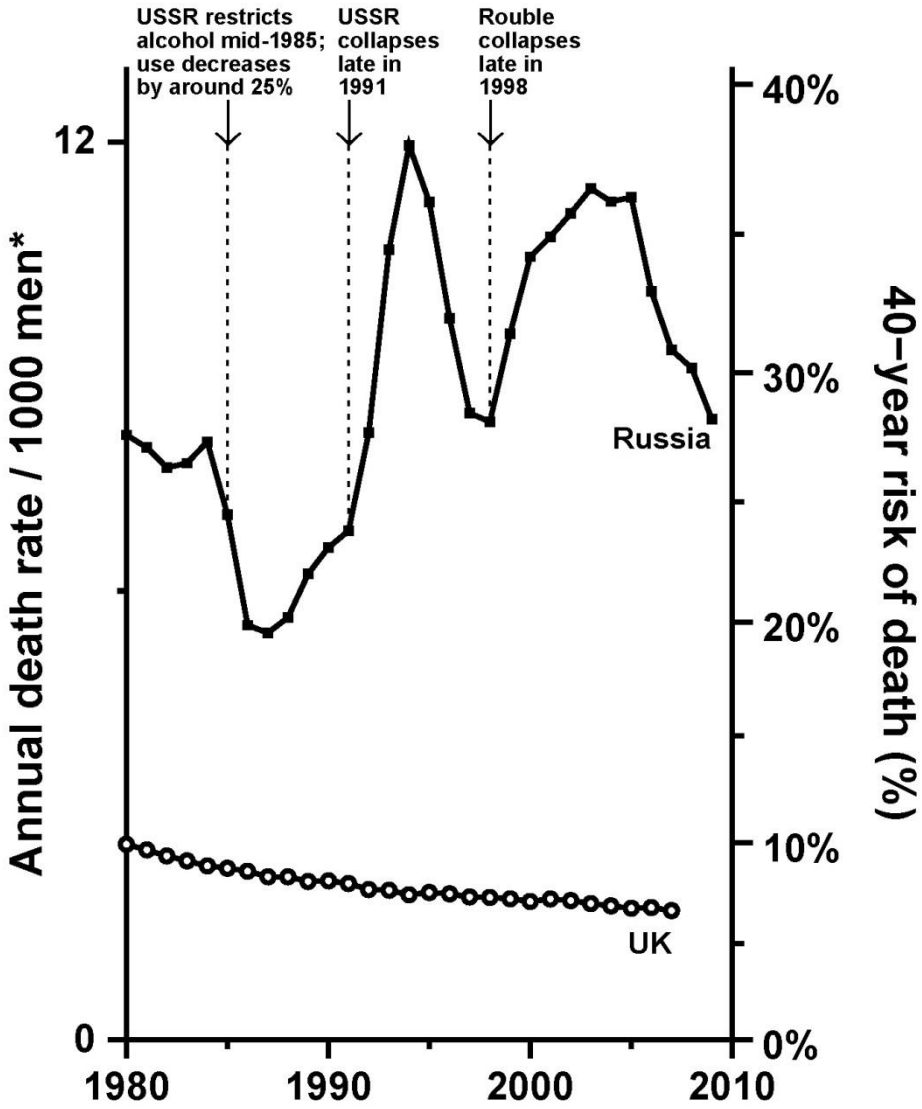
All−cause mortality, males aged 15−54, in Russia 1980−2009 and UK (to 2007)



* Mean of rates in component 5−year age groups (15−19 to 50−54 years)

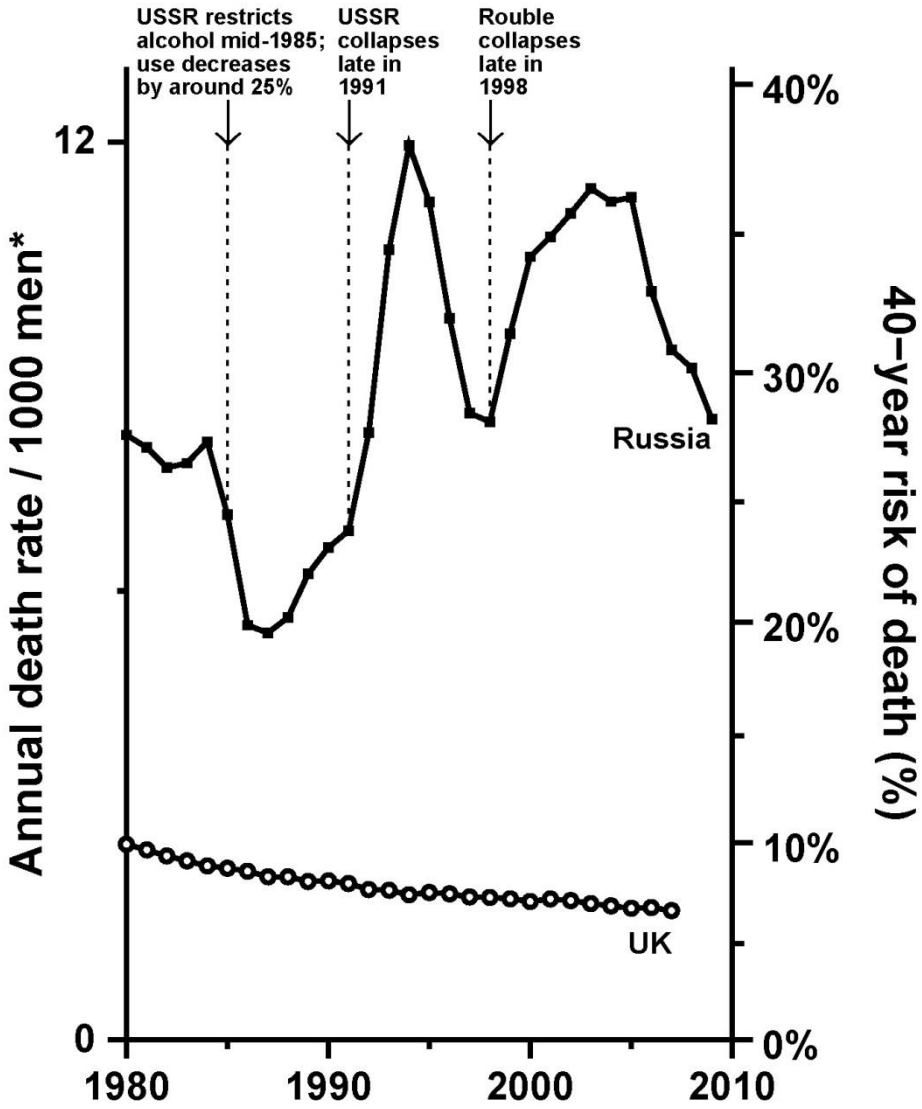
WHO (& 2007−9 ZAGS) mortality and UN population estimates

Alcohol is the main cause of the high rates and rapid fluctuations of premature adult mortality in Russia

(especially at ages 15-54)

Richard Peto
CTSU, University of Oxford, UK

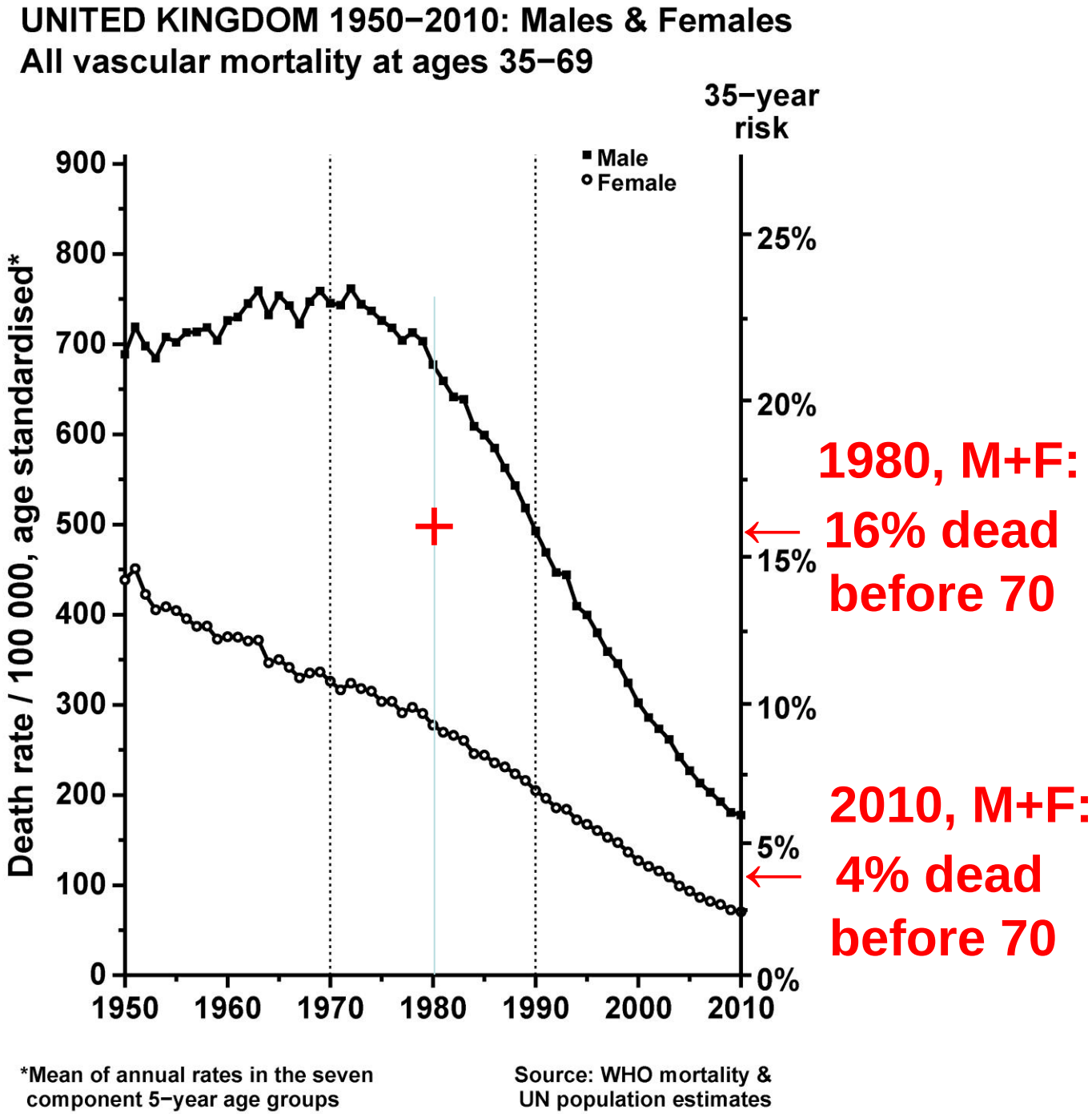
All−cause mortality, males aged 15−54, in Russia 1980−2009 and UK (to 2007)



* Mean of rates in component 5−year age groups (15−19 to 50−54 years)

WHO (& 2007−9 ZAGS) mortality and UN population estimates

Dmitry Medvedev spearheads Kremlin offensive against spirits blamed for 500,000 deaths a year


UNITED KINGDOM 1950−2010: Males & Females
All vascular mortality at ages 35−69
35−year risk
Male
Female
Death rate / 100 000, age standardised*
900
800
700
600
500
400
300
200
100
0
25%
20%
15%
10%
5%
0%
1950
1960
1970
1980
1990
2000
2010
1980, M+F:
16% dead
before 70
2010, M+F:
4% dead
before 70
*Mean of annual rates in the seven component 5−year age groups
Source: WHO mortality & UN population estimates

<u>Secondary</u> prevention of vascular death

For those <u>with</u> disease but still good quality of life, ensure affordable availability and widespread use of generic statins, BP lowering drugs, aspirin, etc.

Practicable in high & middle income populations

<u>Secondary</u> prevention of vascular death

For those <u>with</u> disease but still good quality of life, ensure affordable availability and widespread use of generic statins, BP lowering drugs, aspirin, etc.

Practicable in high & middle income populations

- Aim: treat high risk, not just high BP/chol, getting greater absolute benefit than in 1ry prevention

- No screening program to find those to treat, and no medicalisation of apparently well individuals

Big, modifiable causes of vascular mortality

Tobacco

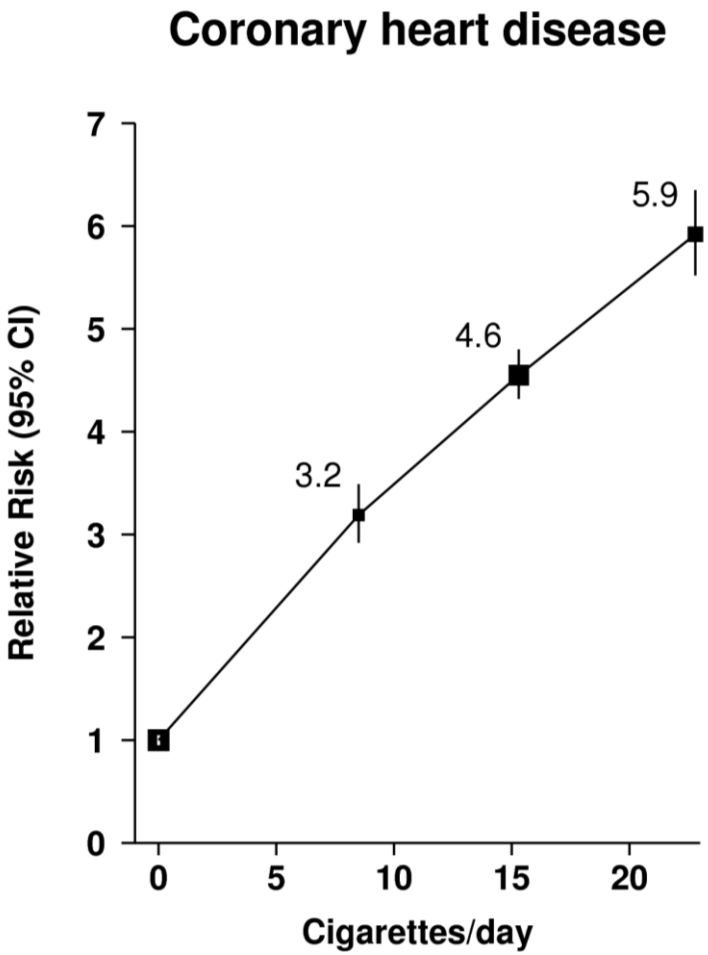
Blood pressure

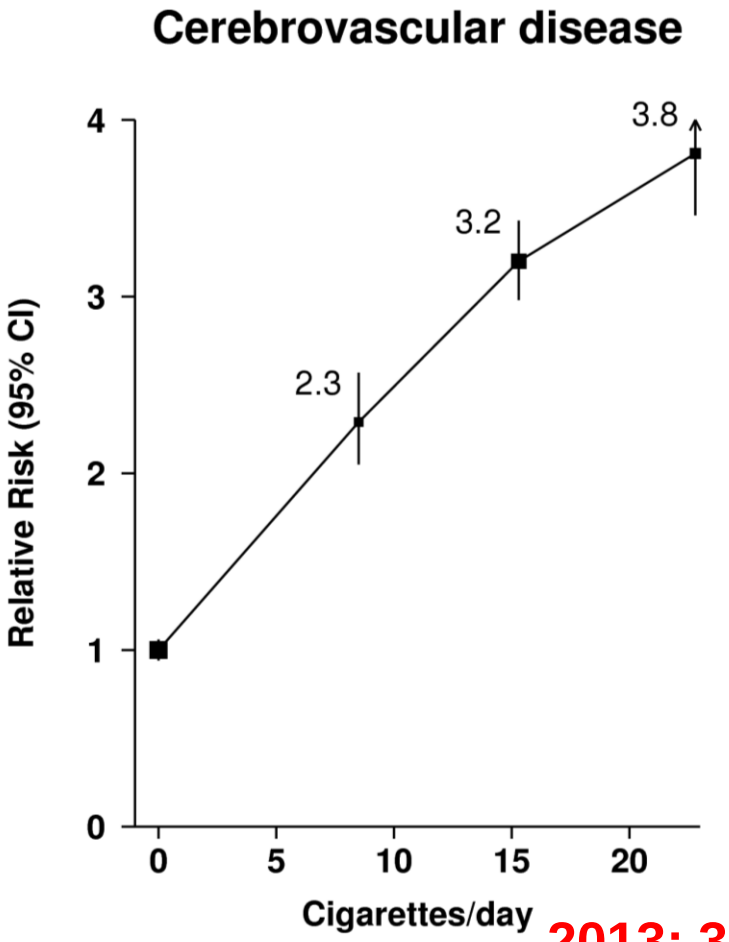
Blood lipids

Adiposity

THE UK MILLION WOMEN STUDY

Vascular mortality, by amount smoked: even light smoking <u>doubles</u> the risk





Lancet 2013; 381: 133

How important is blood pressure to vascular mortality?

20 mmHg systolic BP halves vascular mortality at 35-69

Prospective Studies Collaboration
(1 million adults)

PSC, Lancet 2002; 360: 1903

How important are blood lipids?

Good generic statin regimen reduces LDL cholesterol by ~2 mmol/L and vascular risk by ~40%

(Non-vascular mortality is not affected, so total mortality reduces accordingly)

CTT trial meta-analyses (170,000 pts for 5 years) Lancet 2010; 376: 1670

How important is adiposity to vascular mortality?

If overweight, 10 units BMI about <u>halves</u> MI & stroke In high-inome countries

PSC meta-analyses of 1M
Lancet 2009; 373: 1083