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

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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)
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)
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)
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)
UK: All-cause mortality at ages 15–54
All-cause mortality, males aged 15–54, in Russia 1980–2009 and UK (to 2007)

USSR restricts alcohol mid-1985; use decreases by around 25%  USSR collapses late in 1991  Rubble collapses late in 1998

Annual death rate / 1000 men*

40-year risk of death (%)

12

30%

20%

10%

0%

0

1980 1990 2000 2010

Russia

UK

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

- **Nondrinkers**
  - Nonsmokers: 22%
  - Smokers: 43%

- **Drinkers**
  - Nonsmokers: 46%
  - Smokers: 46%

*Thun, Peto et al. 1997 NEJM 337: 1705*
Vascular mortality trends:

UK, US, Western Europe, Poland & Russia.

Russia is different

(partly because in Russia fatal alcohol poisoning or alcoholic cardiomyopathy may be misclassified as vascular death)
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
UNITED STATES 1950–2005: Males & Females
All vascular mortality at ages 35–69

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

*Mean of annual rates in the seven component 5–year age groups
Source: WHO mortality & UN population estimates
POLAND 1963–2005: Males & Females
All vascular mortality at ages 35–69

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

Source: WHO mortality & UN population estimates
RUSSIAN FEDN. 1980–2005: Males & Females
All vascular mortality at ages 35–69

Death rate / 1000, age standardised*

*Mean of annual rates in the seven component 5-year age groups
Source: WHO mortality & UN population estimates
RUSSIAN FEDN. 1980–2006: Males & Females
All vascular mortality at ages 35–54

*Mean of annual rates in component 5-year age groups
Source: WHO mortality & UN population estimates
The large apparent fluctuations in Russian vascular mortality may be due mainly to fluctuations in alcoholic heart damage or poisoning mis-certified as vascular disease.
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
RUSSIAN FEDERATION: 1988
Female population in millions on 1st January 1988

Source: Human Mortality Database
www.mortality.org
RUSSIAN FEDERATION: 1988
Female population in millions on 1st January 1988

Year of birth

Source: Human Mortality Database
www.mortality.org
RUSSIAN FEDERATION: 1988
Female population in millions on 1st January 1988

Source: Human Mortality Database
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RUSSIAN FEDERATION: 1988
Female population in millions on 1st January 1988

Year of birth

Source: Human Mortality Database
www.mortality.org
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
RUSSIAN FEDERATION: 1988
Female population in millions on 1st January 1988

Source: Human Mortality Database
www.mortality.org
RUSSIAN FEDERATION: 2003
Female population in millions on 1st January 2003

Year of birth

Source: Human Mortality Database
www.mortality.org
RUSSIAN FEDERATION: 2003
Female population in millions on 1st January 2003

Source: Human Mortality Database
www.mortality.org
Russia, destructive consumption of alcohol and all-cause 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 & not 0.5 B/binge
Other drinkers: <1, 1-3, 3+ B/week

Get RR for top vs reference 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)

Ages 15–34
Ages 35–54
Ages 55–74

Death rate / 1000, age standardised*

20–year risk of death

*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

Ages 15–34

Ages 35–54

Ages 55–74

Death rate / 1000, age standardised*

20-year risk of death

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

WHO (8 2007–9 ZAGS) mortality and UN population estimates
All-cause mortality, Russia 1980-2009 and UK (to 2007): females

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

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

LATVIA, 1980–2007
All-cause mortality, men aged 15–54

Source: WHO mortality & UN population estimates
UKRAINE, 1981-2005
All-cause mortality, men aged 15-54

BELARUS, 1981-2003
All-cause mortality, men aged 15-54

Source: WHO mortality & UN population estimates
All-cause mortality, males aged 15–54, in Russia 1980–2009 and UK (to 2007)

- USSR restricts alcohol mid-1985; use decreases by around 25%
- USSR collapses late in 1991
- Rouble collapses late in 1998

* 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)

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

- USSR restricts alcohol mid-1985; use decreases by around 25%
- USSR collapses late in 1991
- Ruble collapses late in 1998

* 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

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
Secondary prevention of vascular death

For those **with** 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
Secondary prevention of vascular death

For those with 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
Vascular mortality, by amount smoked: even light smoking doubles the risk

Coronary heart disease

Cerebrovascular disease

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 halves MI & stroke

In high-income countries

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