



Finnish Institute of
Occupational Health

Evidence for action in population health: from monocausality to a systems approach

SIHLWA-8 & BSN
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The changing paradigm of health care and OHS over the last 70 years

- Medical model: individuals and illnesses
 - develops the diagnostics and treatment of occupational injuries and illnesses
 - Finland 1940-1980
- Public health model: 'risk factor epidemiology'
 - identifies and prevents factors causing illness at work
 - Finland 1980 →
- Systems model: causes for causes
 - identifies and prevents socioeconomic and other mechanisms leading to exposure
 - illness and exposure-driven interests also important
 - Finland → going in this direction

Alcohol on WHO's list of top-10 risks

- 2 billion people consume alcoholic beverages
- 76.3 million people have diagnosable alcohol use disorders

WHO 2004



10 Greatest Global Health Risks

- being underweight
- unsafe sex
- iron deficiency
- indoor smoke from solid fuels
- unsafe water, sanitation, and hygiene
- high blood pressure
- tobacco consumption
- **alcohol consumption**
- high cholesterol
- obesity

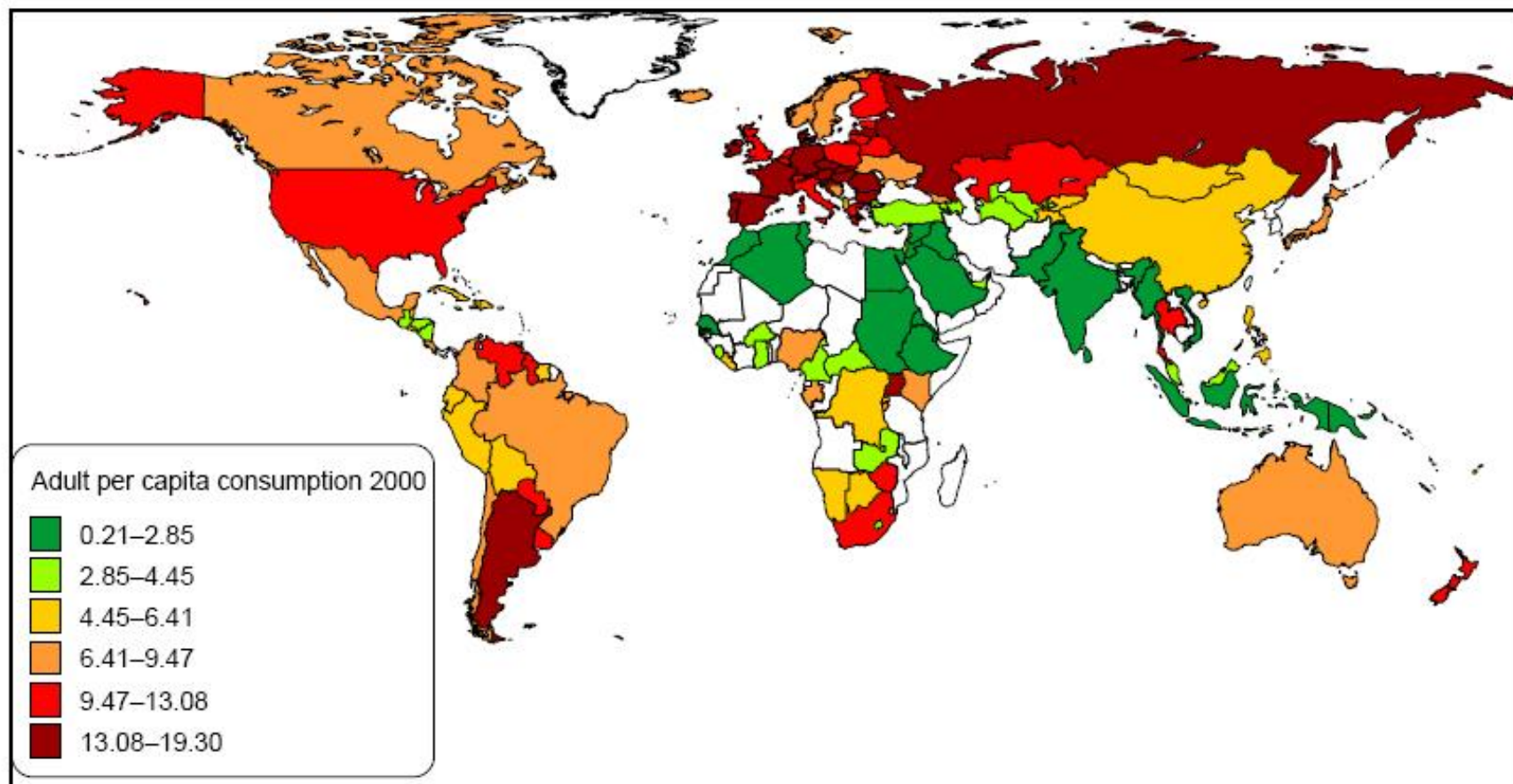
Source: World Health Organization. 2002. The World Health Report 2002: Reducing Risks, Promoting Healthy Life. Geneva, Switzerland:World Health Organization.

Global figures, from emergency rooms

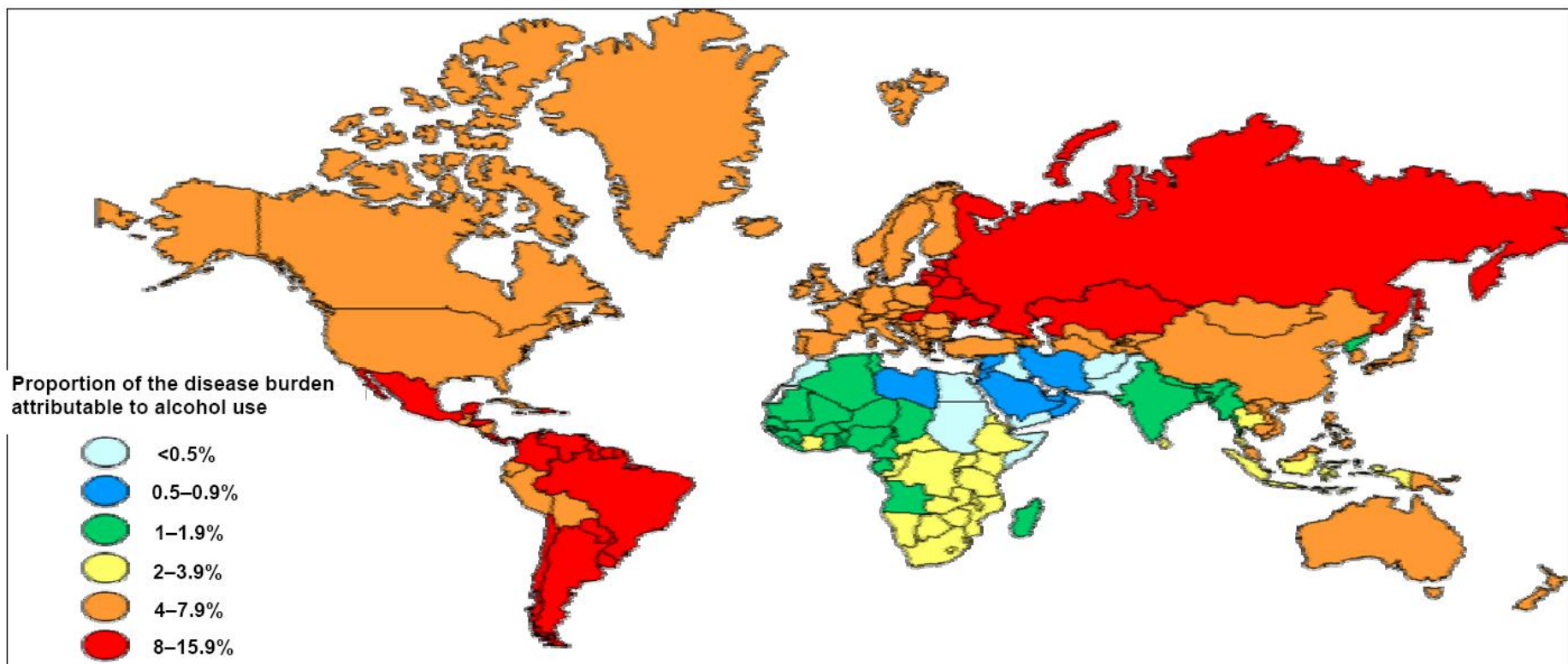
- Globally, alcohol
 - causes 3.2% of all deaths = 1.8 million deaths annually
 - accounts for 4.0% of disease burden
- Of the total number of alcohol-attributable deaths
 - 32.0% are from unintentional injuries (road traffic injuries, drowning, burns, poisonings and falls)
 - 13.7% are from intentional injuries (result from deliberate acts of violence against oneself or others)

WHO 2007

Alcohol consumption in the world



Burden of disease attributable to alcohol use



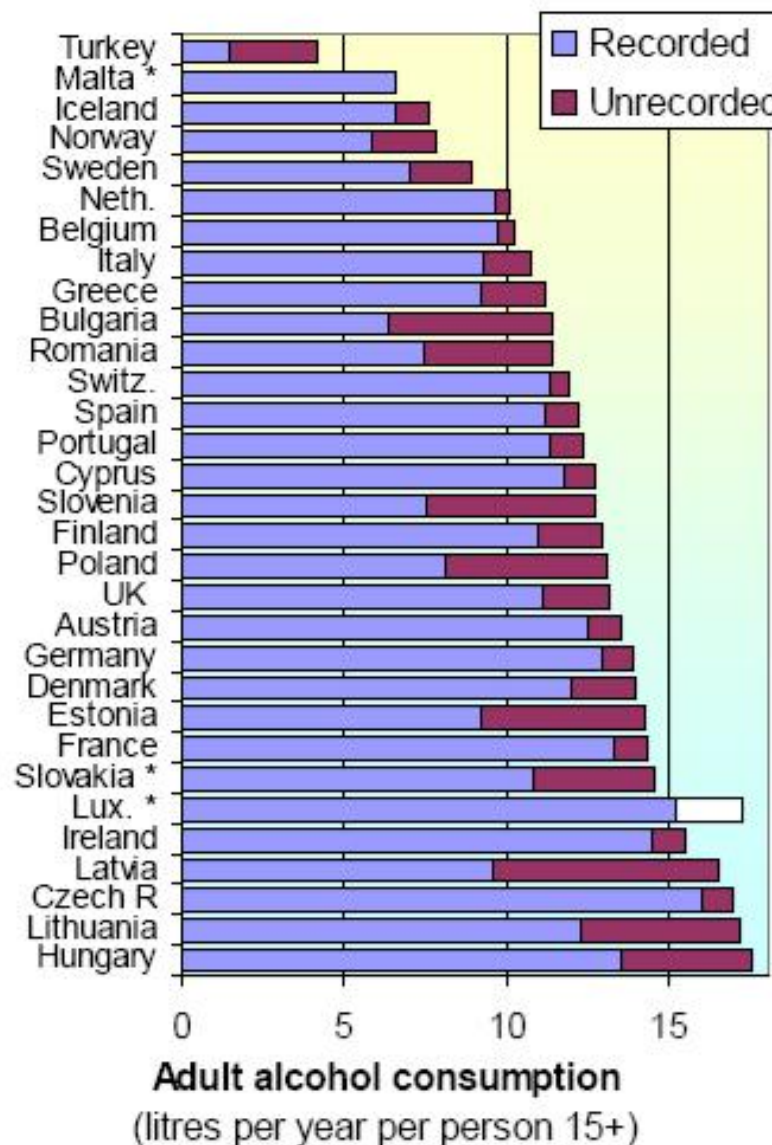
European statistics

- Alcohol is responsible for
 - 12% of male and 2% of female premature death and disability
 - over 10% of youth female mortality and around 25% of youth male mortality
- + Alcohol is estimated to delay 160,000 deaths in older people
 - + cardioprotective effect for women who die after the age of 70 years

Alcohol in Europe

- 23 million people dependant on alcohol
- 195,000 deaths
- 17,000 deaths due to road traffic accidents
- 27,000 accidental deaths
- 2,000 homicides
- 10,000 suicides
- 45,000 deaths from liver cirrhosis
- 50,000 cancer deaths
- 17,000 deaths due to neuropsychiatric conditions
- 200,000 episodes of depression
- 60,000 underweight births
- 5-9 million children in families adversely affected by alcohol

Alcohol consumption across Europe



Alcohol in Europe, 2006

Alcohol consumption and risk of death

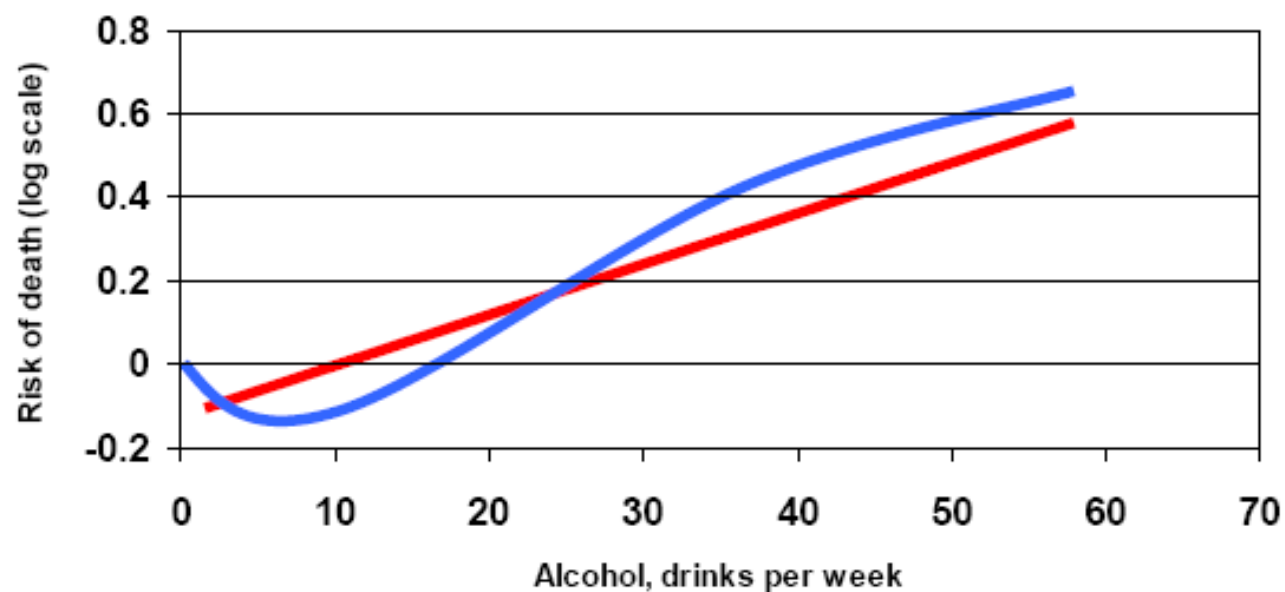


Figure 5.10 Risk of death in men when non-drinkers included in the analysis (blue line) and excluded from analysis (red line). Source: Johansen *et al.* (2005), Copenhagen city heart study. Modelled using General Additive Models.

Share of deaths attributable to alcohol in the EU

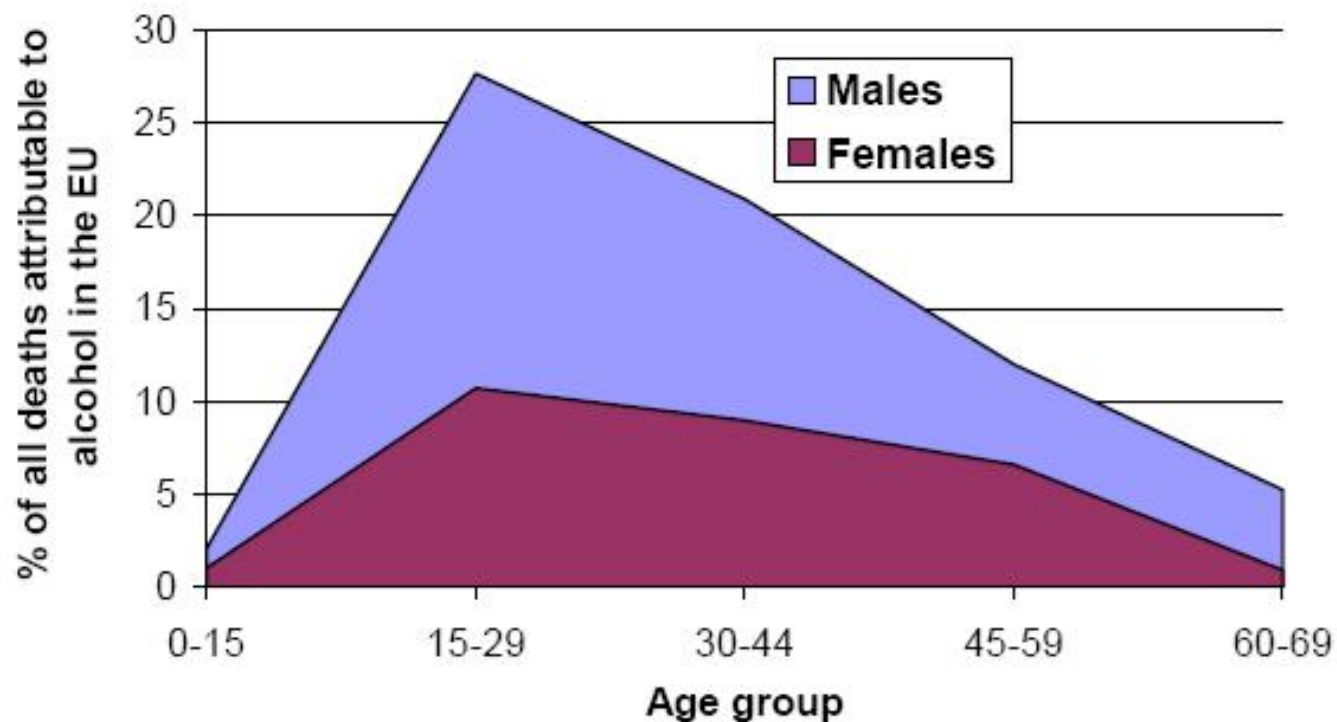
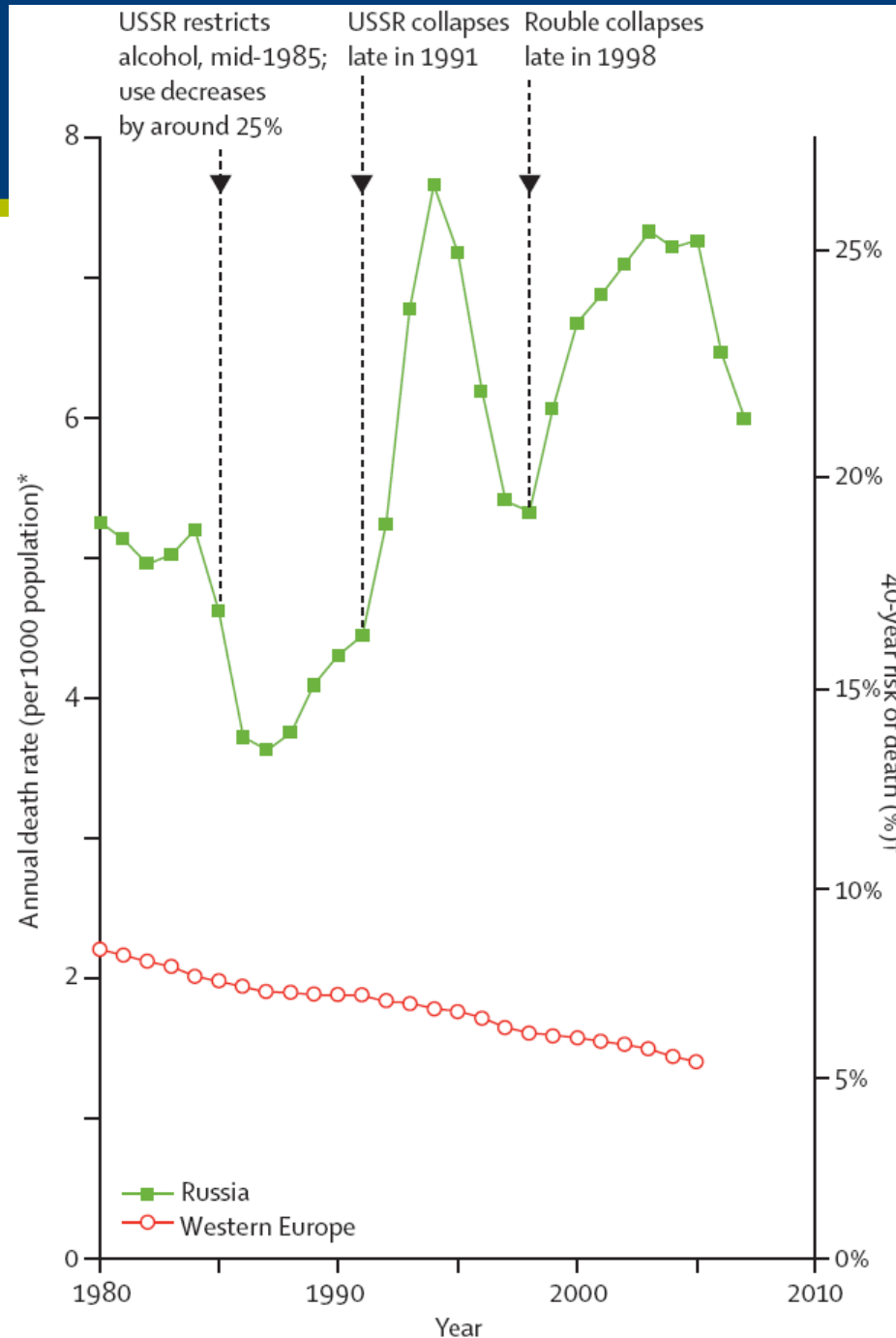


Figure 6.1 The share of deaths attributable to alcohol in EU citizens younger than age 70 years (year 2000). Source: GBD data (Rehm 2005).

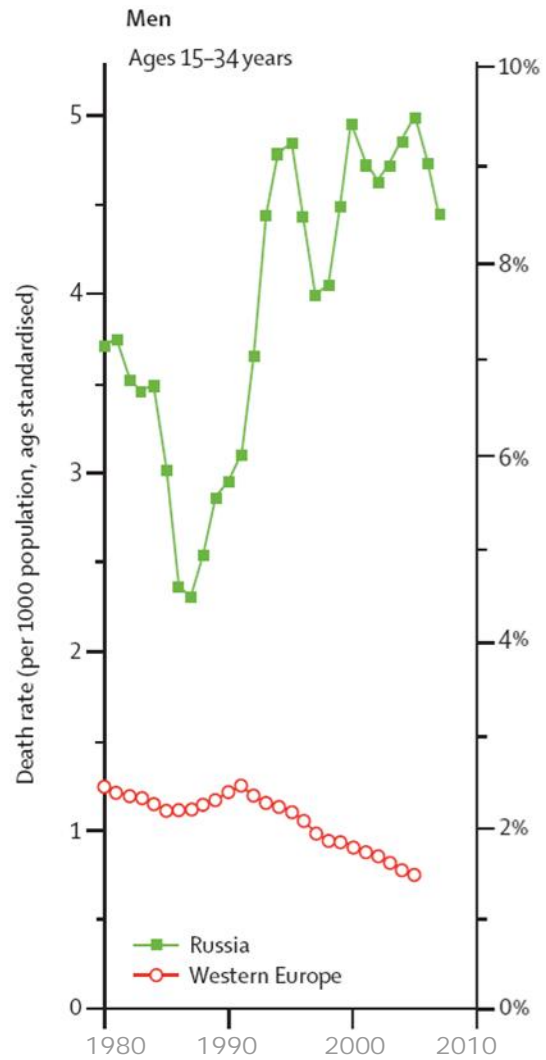
Mortality from all causes and 40 year risk of death

In men, three causes accounting most alcohol-related deaths were accidents and violence (RR 5.9), alcohol poisoning (21.7) and acute IHD (other than MI, RR 3.0). In women, alcohol-associated excesses accounted for 52% of all study deaths at ages 15-54 yrs.

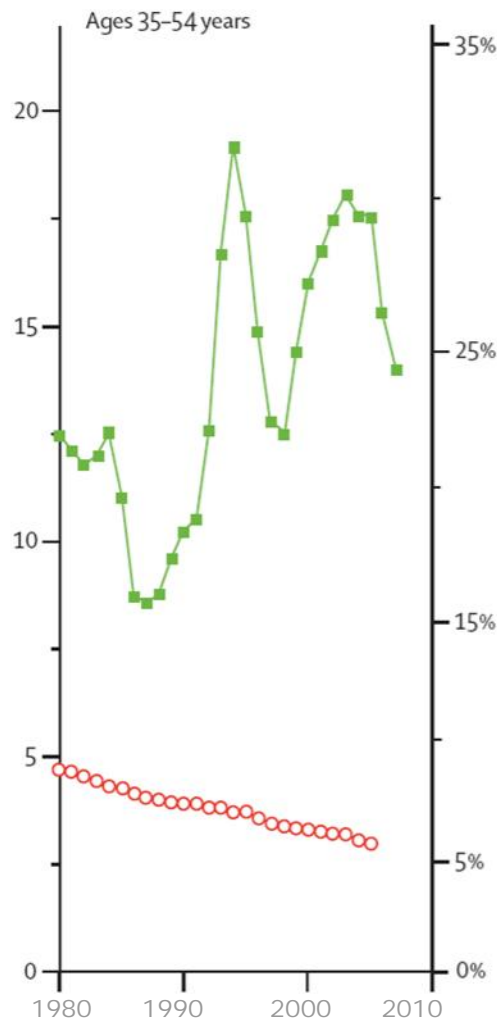


Zaridze et al.
Lancet 2009

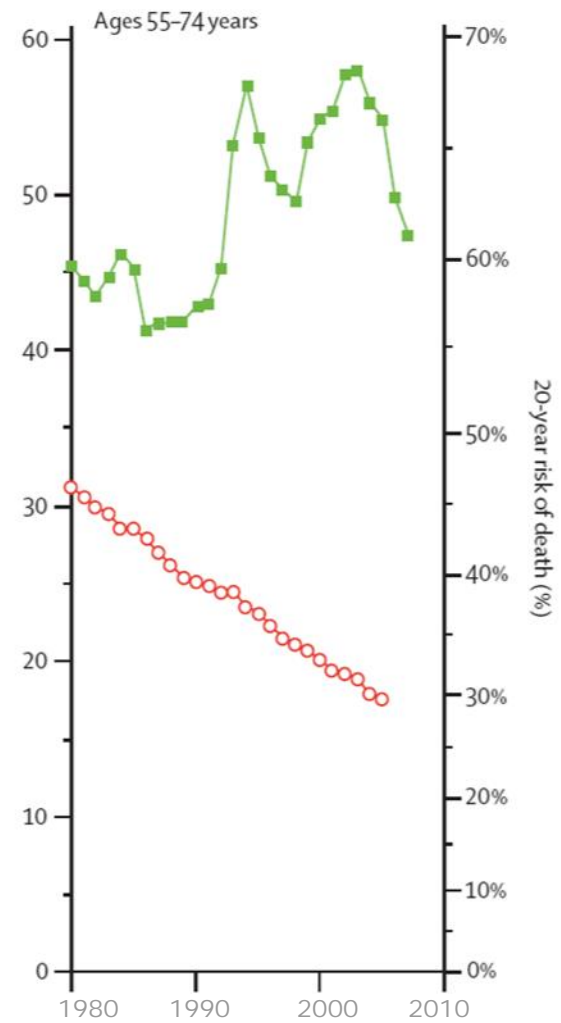
All-cause mortality rates and 20-year risks of death (1980-2007) in men



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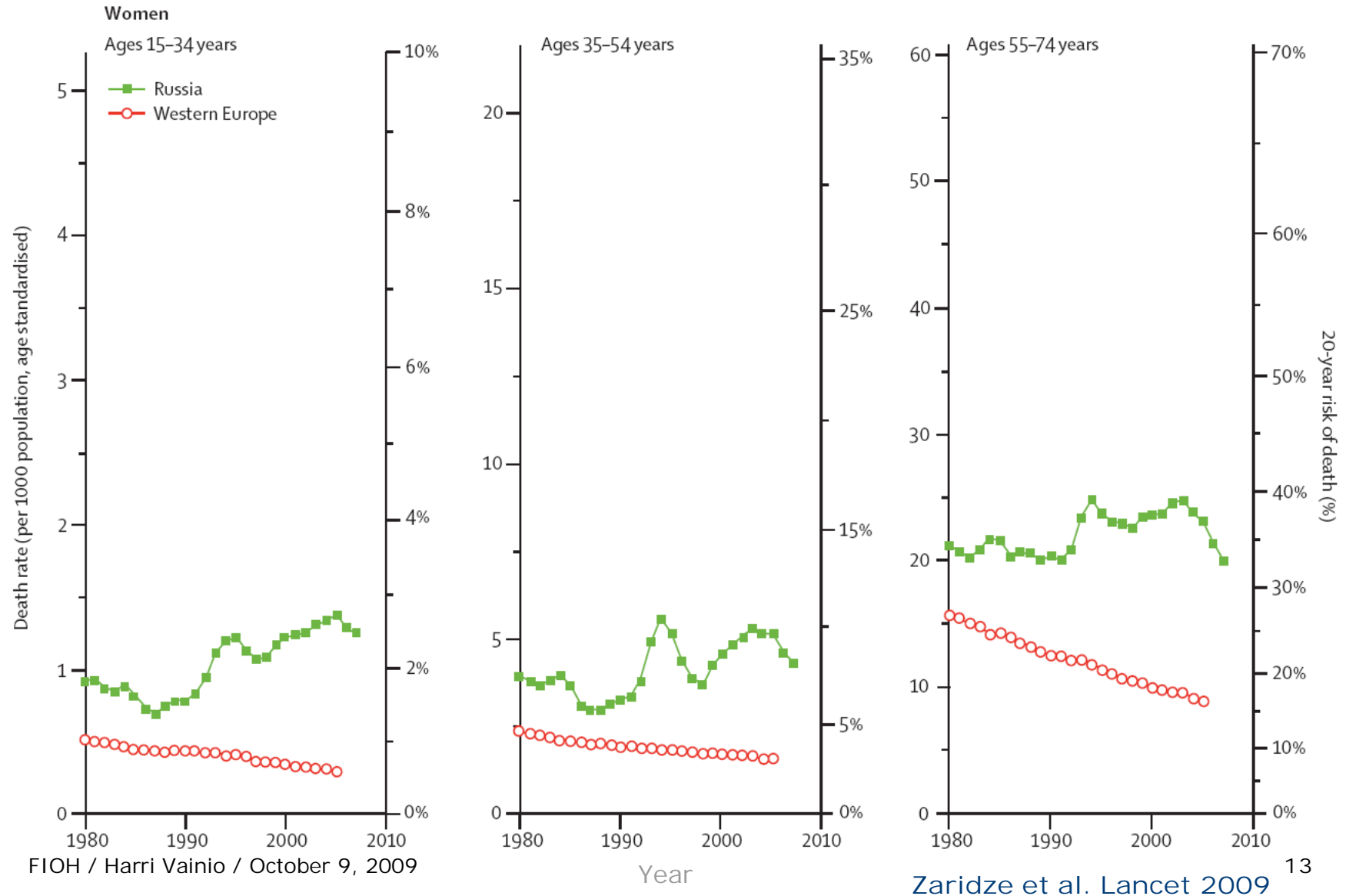


Year

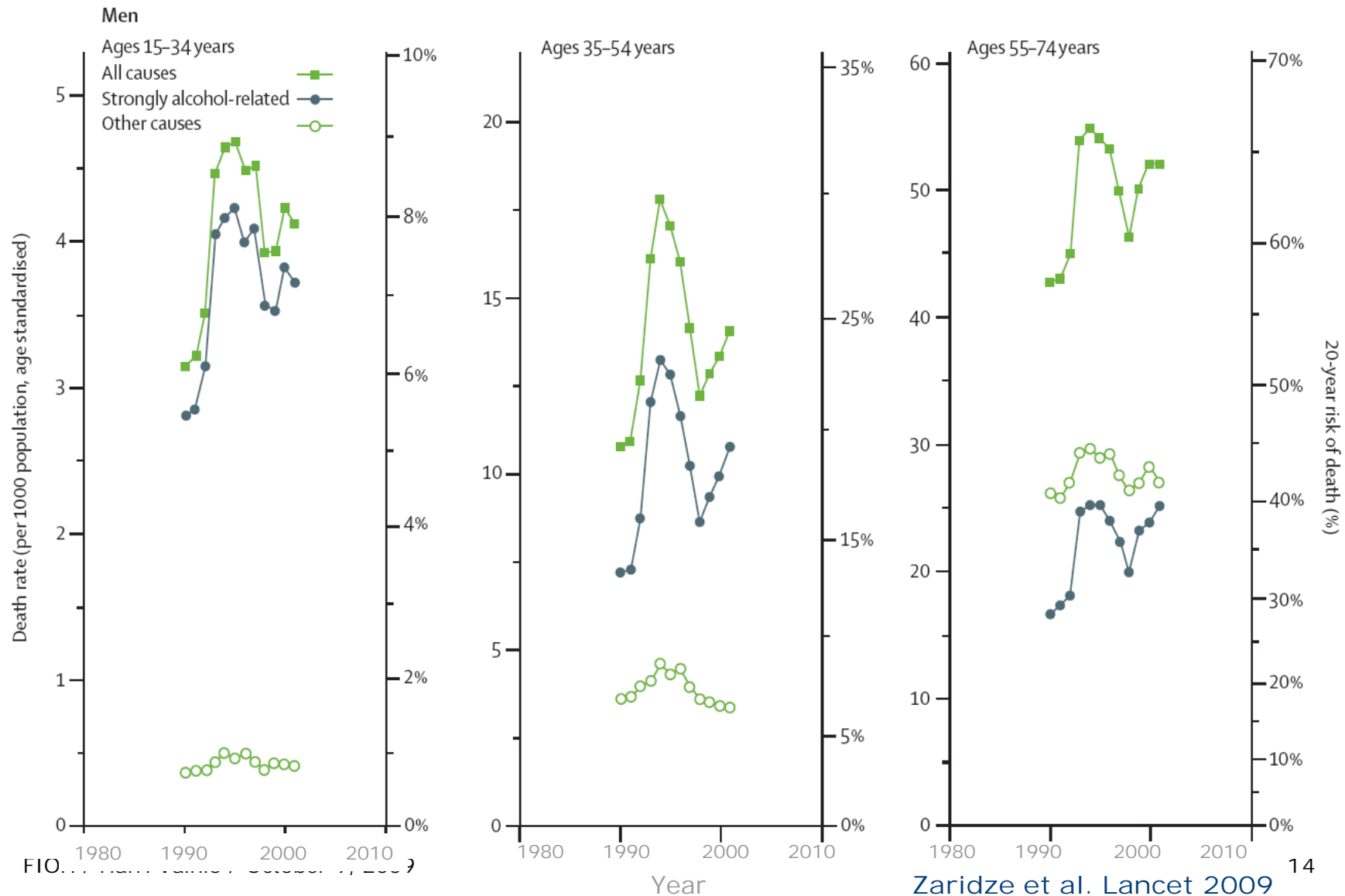


Zaridze et al. Lancet 2009

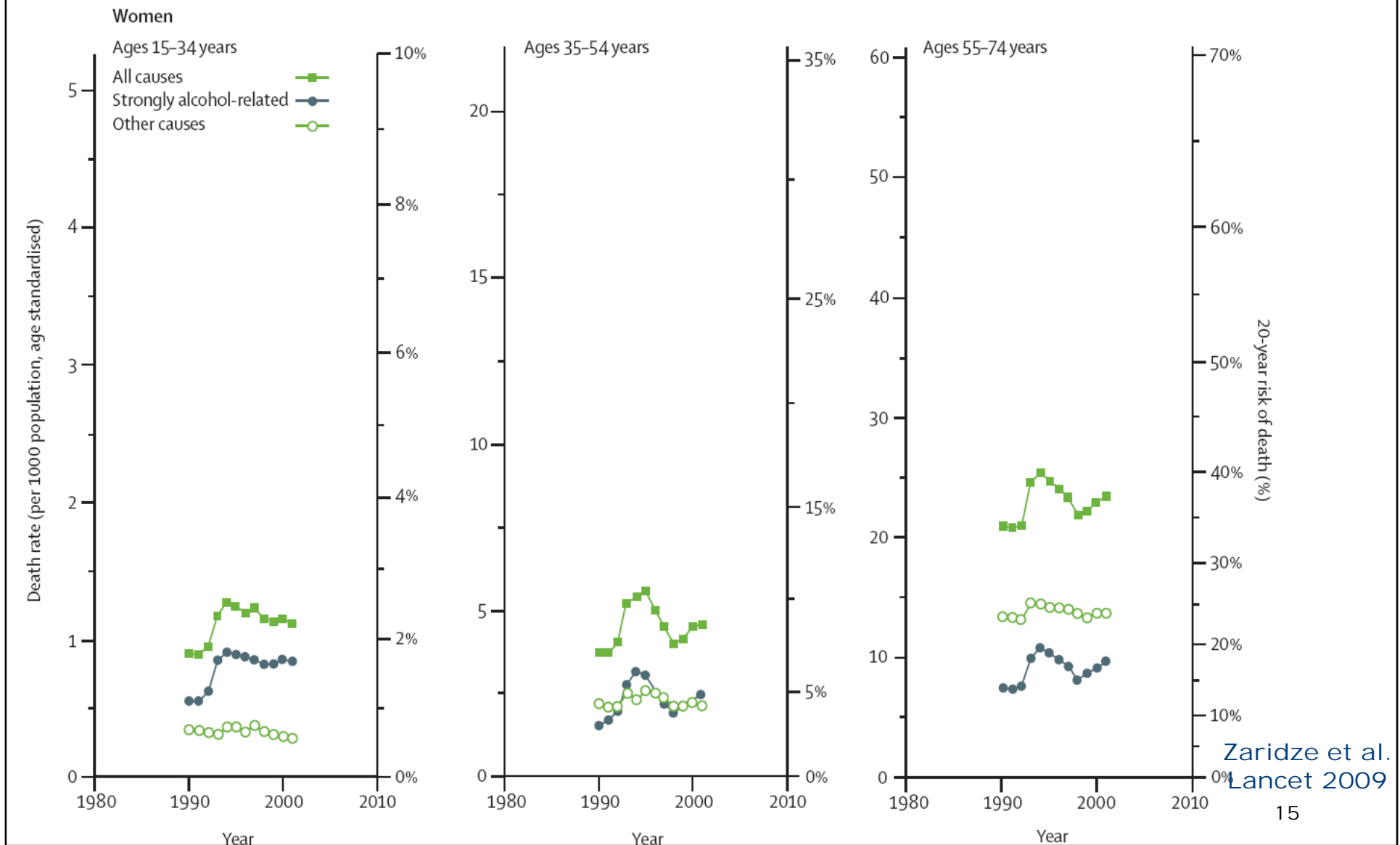
All-cause mortality rates and 20-year risks of death (1980-2007) in women



Mortality from all causes, from causes strongly related to alcohol, and from other causes in the Altay and Tomsk regions of Russia, 1990-2001



Mortality from all causes, from causes strongly related to alcohol, and from other causes in the Altay and Tomsk regions of Russia, 1990-2001

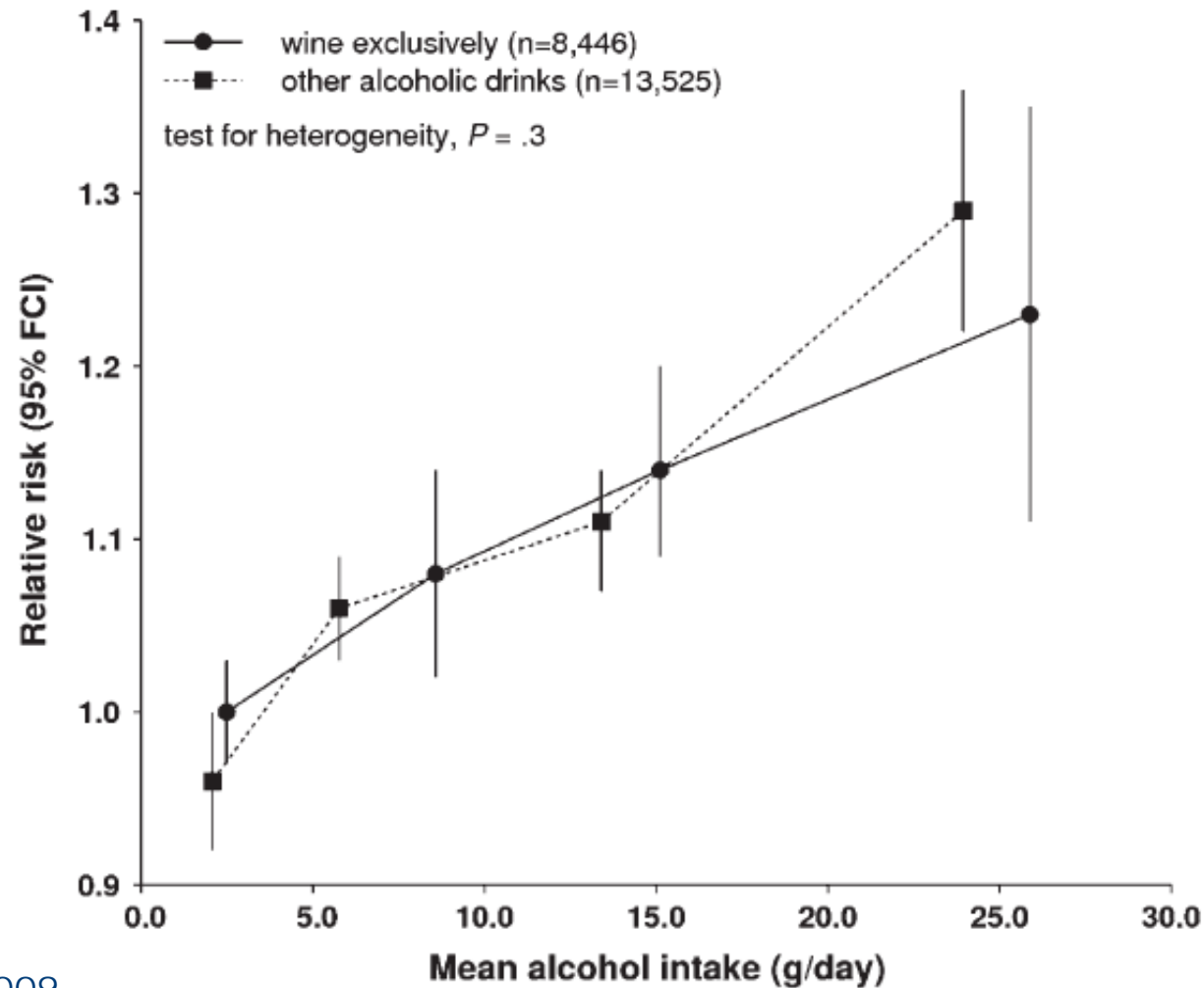


Alcohol is carcinogenic to humans

Organ site	Relative Risk increase for consumption of 50 g/day
Oral cavity, pharynx, larynx and oesophagus	x 2-3
Liver	difficult to quantify
Breast	x 1,5
Colorectum	x 1,4

IARC 2007

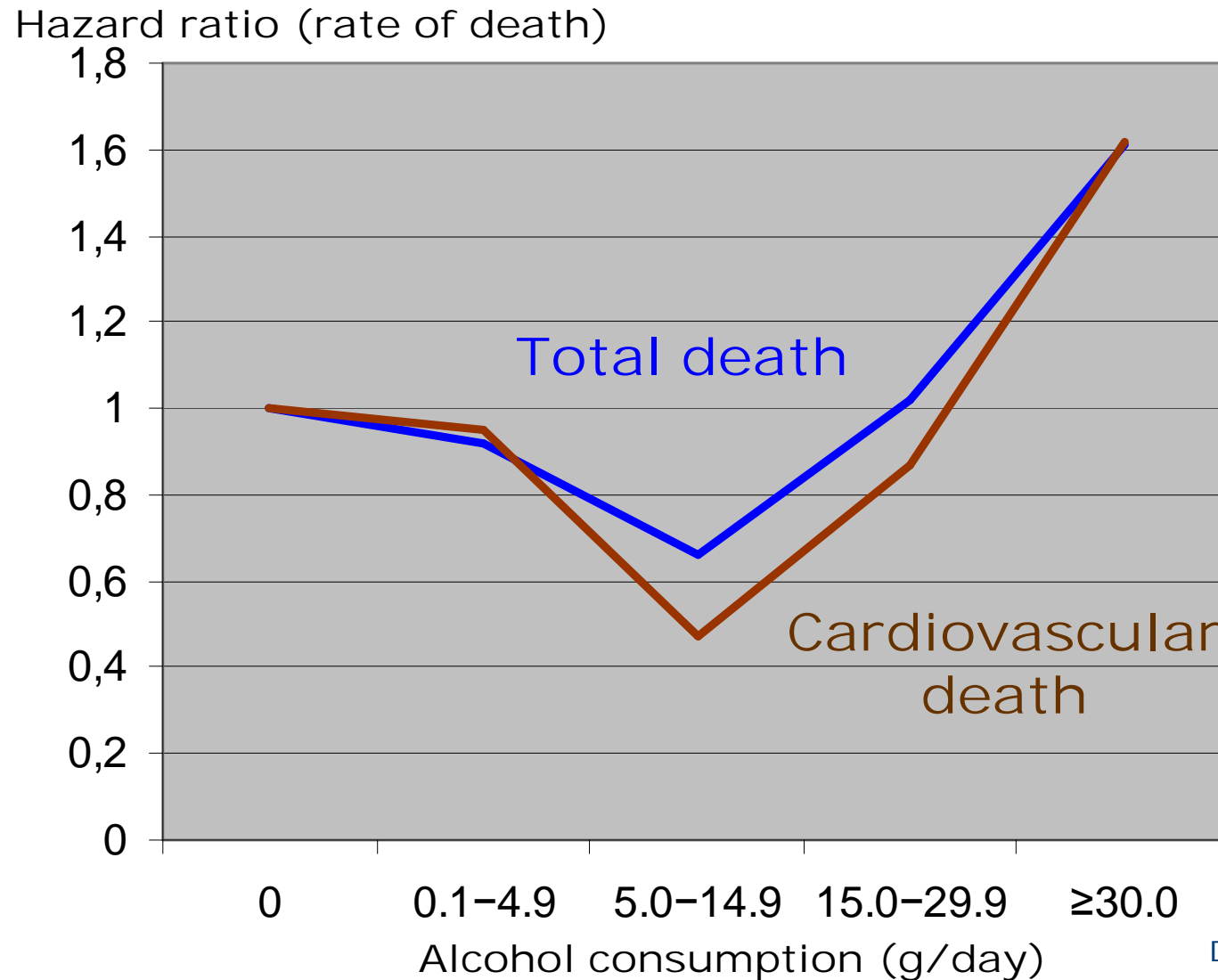
'The Million Women' study in the UK



Allen et al. JNCI 2009

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Alcohol consumption and risk of cardiovascular death in women



Moderate Alcohol Consumption Lowers the Risk of Type 2 Diabetes

A meta-analysis of prospective observational studies

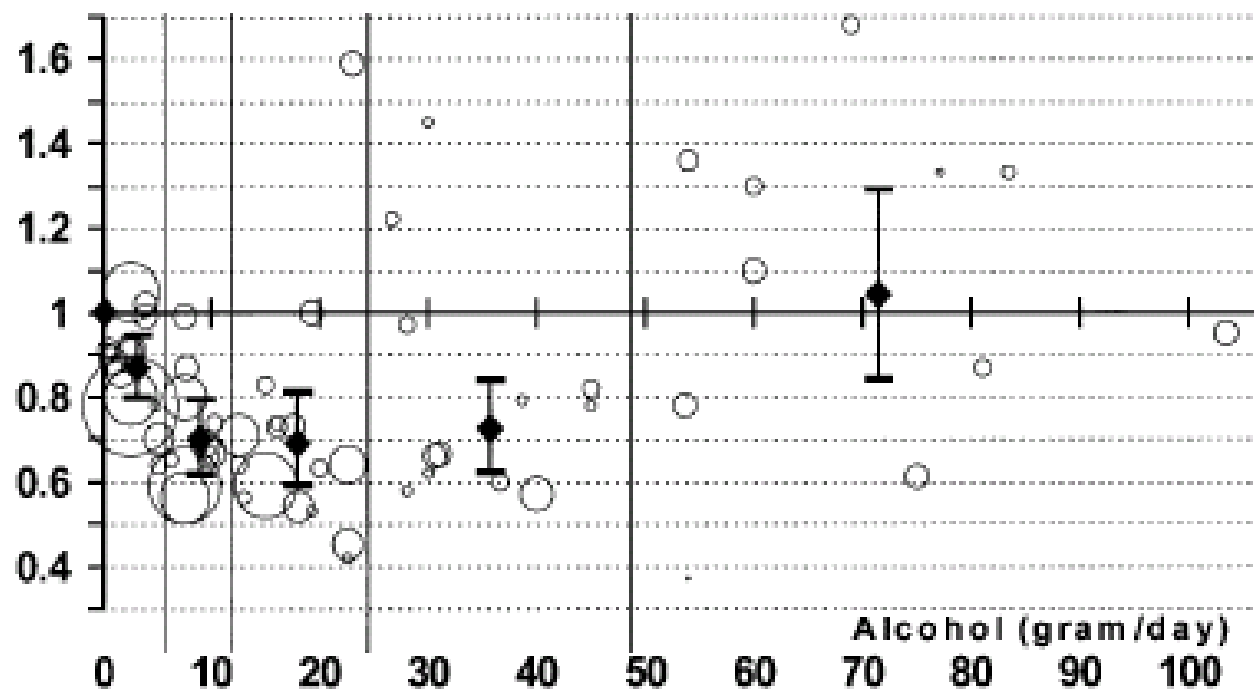


Figure 1—Scatterplot of the RR estimates of type 2 diabetes reported in the 15 included studies, and the pooled RR estimates with corresponding 95% CIs for five alcohol consumption categories with the nonconsumers as reference category. Each study provides more than one RR estimate. The area of each circle is proportional to the precision of the RR estimate (inverse of its variance).

Mixed effects vs. actions

- Moderate alcohol use and health effects
 - Increased risk of breast cancer, upper aerodigestive tract cancer, liver cancer, pancreas cancer, colon cancer
 - FAS
 - Accidental deaths, traffic accidents, drunken driving, etc
 - + Decreased risk of cardiovascular disease at low doses?
 - + Decreased risk of T2D
- What is the net benefit of moderate alcohol use on health outcomes?
- Which societal actions should be taken?

Polymorphic metabolic genes modify the individual risks of alcohol induced disease

- Alcohol is an important risk factor for upper aerodigestive cancers
- Acetaldehyde derived from alcoholic beverages is carcinogenic to humans (IARC 2009)
- Alcohol is principally metabolized by alcohol dehydrogenase (ADH) enzymes
 - gene variants rs1229984 (ADH1B) and rs1573496 (ADH7) were significantly protective against aerodigestive cancer
 - the effects became more apparent with increasing alcohol consumption
- => Multiple ADH genes are involved in upper aerodigestive cancer etiology

Alcohol – a friend or a foe?

- Public health community is confused with health claims related to low intake of alcoholic beverages
- WHO: no alcohol consumption is safe

Brief intervention encourages heavy-users to reduce their alcohol consumption

- Brief intervention, a tool for the OHS
 - OHS personnel inquires after drinking habits and informs on the health risks of alcohol use
 - quick and easy-to-use tool for indentifying risky drinkers
 - goal: from heavy to moderate alcohol consumption
- Target group
 - working aged heavy-users who are not dependent on alcohol – yet



Thank you!

A-Step

*Preventing alcohol-related
problems
at the workplace*



- opening a discussion
- reviewing existing practices
- updating the alcohol and drug policy
- basis for good practices
- basis for workplace reports
- supporting early intervention