



# Smoking-, alcohol- and obesity-attributable mortality trends in Europe



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Research project "Smoking, alcohol and obesity - ingredients for improved and robust mortality projections" funded by Netherlands Organisation for Scientific Research (NWO)(grant no. 452-13-001)



## Introduction

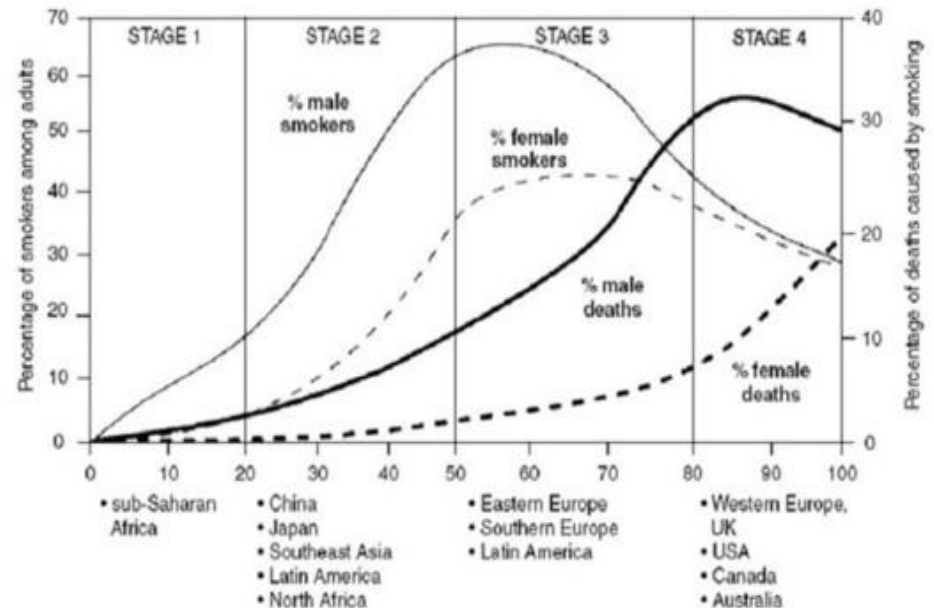
- › Smoking, excessive alcohol consumption, and overweight and obesity => the most significant preventable risk factors in the EU (WHO 2009).
- › They have unexpectedly surged to unprecedented levels across countries in recent years => “epidemics”
- › Large role in premature mortality => “actual causes of death”
- › Unhealthy lifestyles of youth are of particular concern and are likely to have longlasting effects on future eo



# Important role of smoking

- › Largest preventable cause of death EU (WHO, 2009)
- › Most important determinant mortality levels, trends, differences between countries, sexes, cohorts
- › Smoking epidemic => Non-linear pattern + still imprint

Descriptive model smoking epidemic



Lopez et al. 1994



# Important role of alcohol

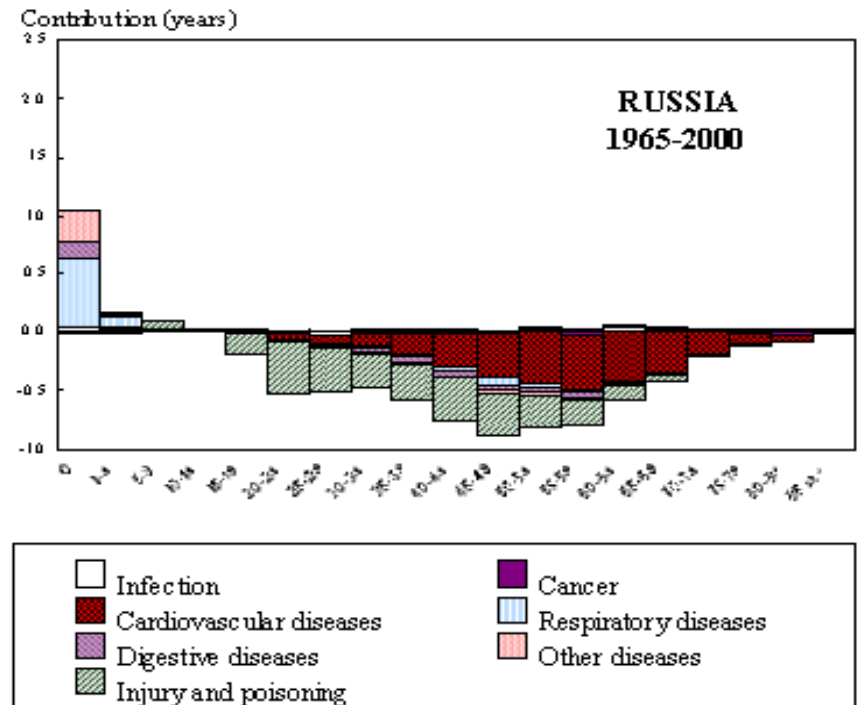
## Excessive alcohol consumption

› Third preventable cause of death EU (WHO, 2009), and first risk factor for the burden of disease in Eastern Europe (Lim et al. 2012).

› Esp adult men Eastern Europe

› Partly responsible for decline e.o. Eastern Europe (e.g. Russia)

› Increasing among youth in Western Europe



Vallin & Meslé (2004)

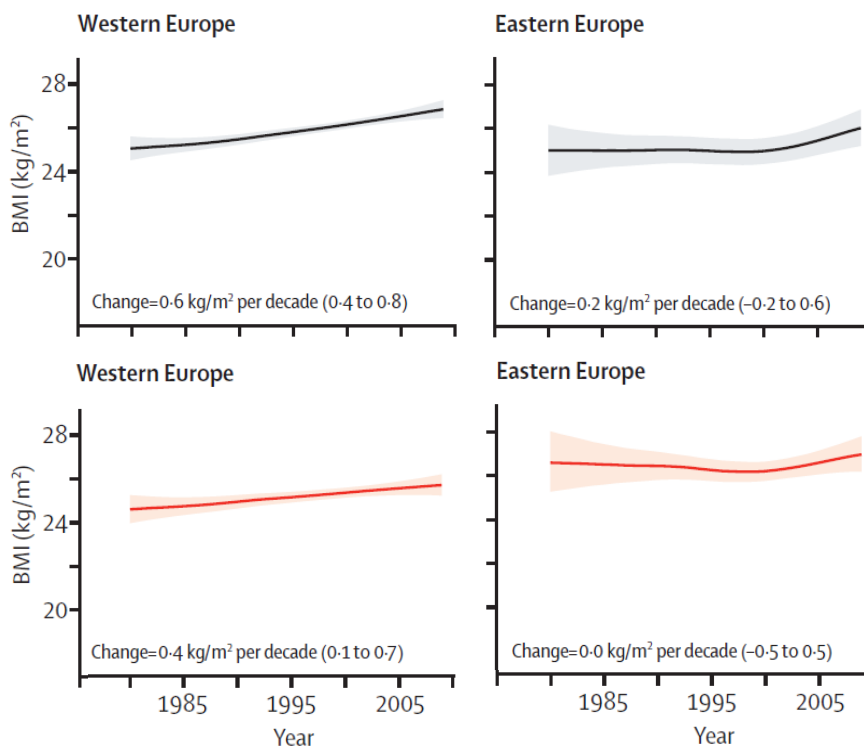


# Important role of obesity

## Overweight & obesity =>

- > New epidemic
- > “Over 50% of the adult population in the EU are overweight or obese. Obesity prevalence has tripled in the last two decades.” (WHO, 2009)
- > Sex differences; important differences therein within Europe

## Trends in age-standardised mean BMI



Finucane et al. 2011



## Previous research

- › In academics: mostly focus on one country or a couple of them
- › Mostly not time trends
- › Differences in estimation methodology
- › No formal analysis of the importance of birth cohort effects



## Particularly interesting

- › European wide overview of levels and trends using comparable estimates
- › The potential role of birth cohort
- › Their importance of smoking, alcohol and obesity in life expectancy (trends)



# Objective

- › To study indepth the past trends in smoking-, alcohol- and obesity attributable mortality
  - Cohort effects
  - Contribution to  $e_0$





# Data

- › Lifestyle-attributable mortality
  - Smoking => indirect method (Peto et al. 1992): lung cancer mortality as proxy of past smoking x RR of dying from smoking
  - Alcohol => Liver-cirrhosis mortality, and GBD estimates (Forouzanfar et al. 2015)
  - Obesity => Comparative Risk Assessment methodology (WHO 2004 ) (RR from Flegal et al. 2013)



## Methods & Results

- › Mapping lifestyle-attributable mortality fractions
- › Trends over time
- › Examining the contribution of birth cohorts (APC analyses, Clayton and Schifflers (1987) approach)
  - Drift: shared linearity between period and birth cohort

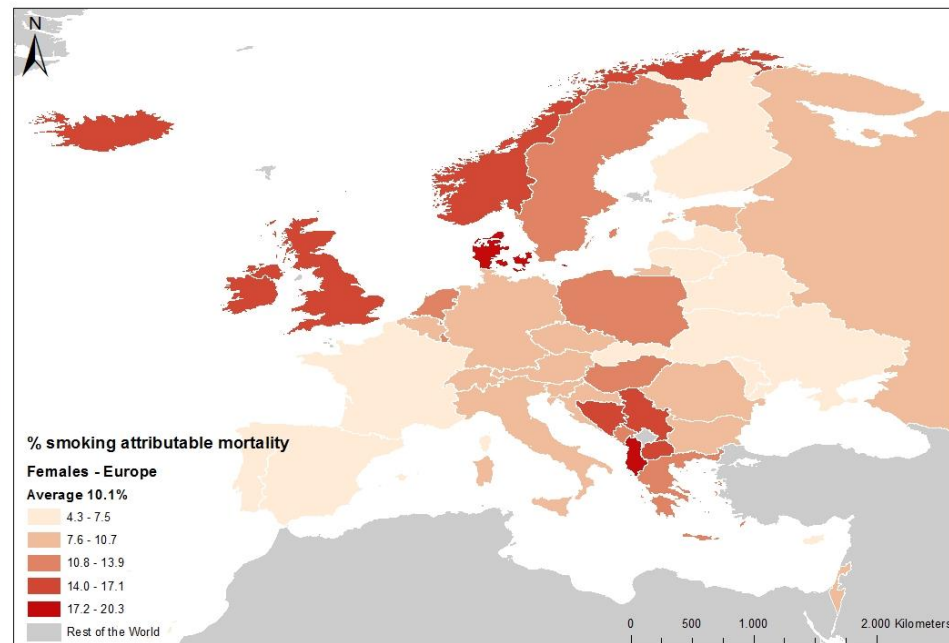
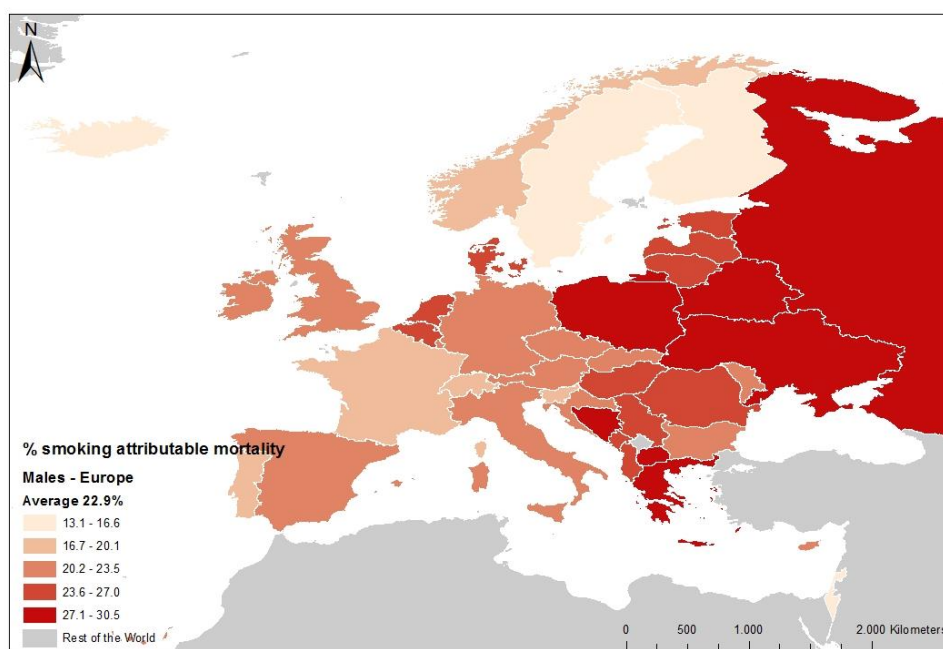
Effect on all-cause mortality trends and differences by eliminating life-style-attributable mortality (smoking), and by estimating PGLE (alcohol)



# MAPS

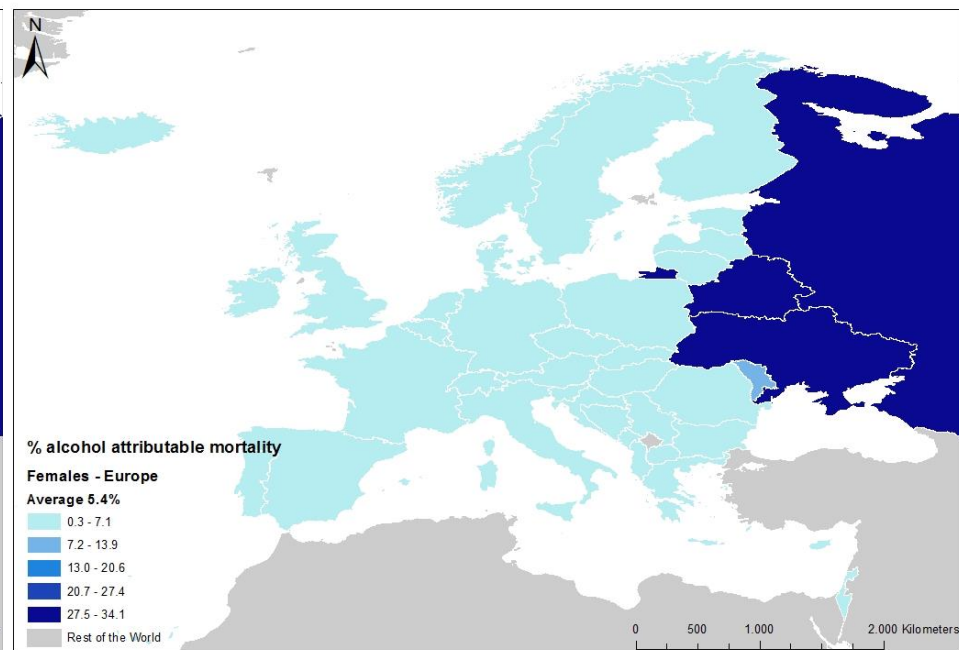
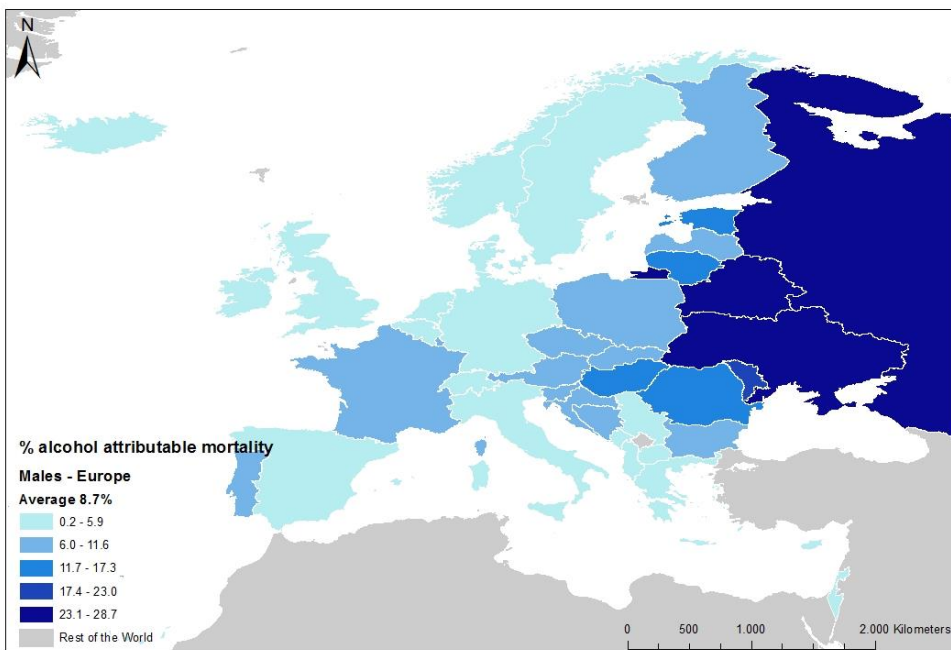


# % smoking-attributable mortality in 2010



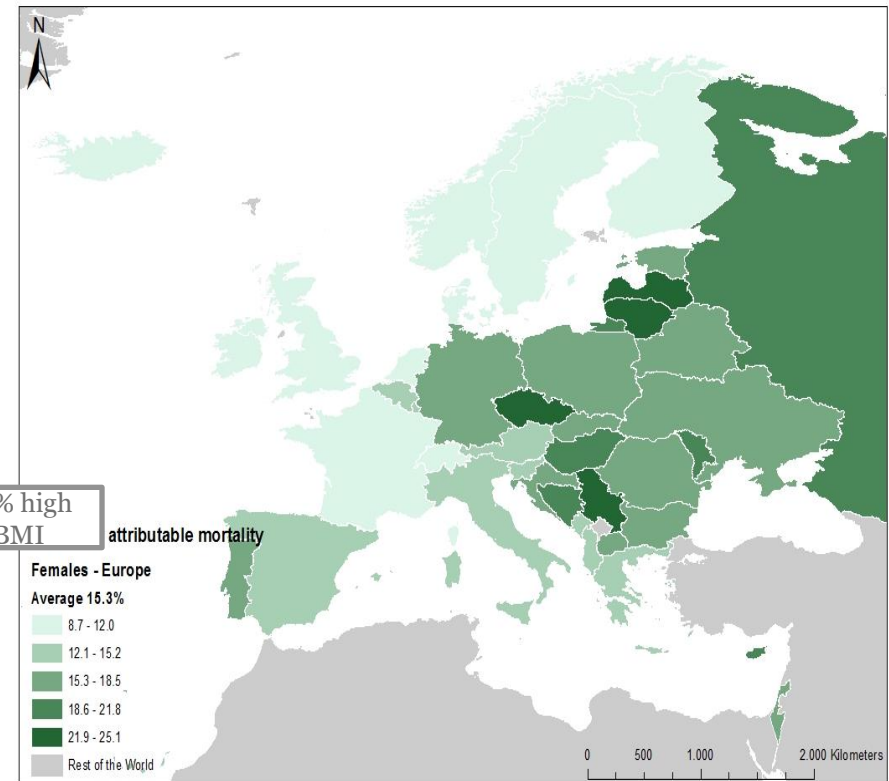
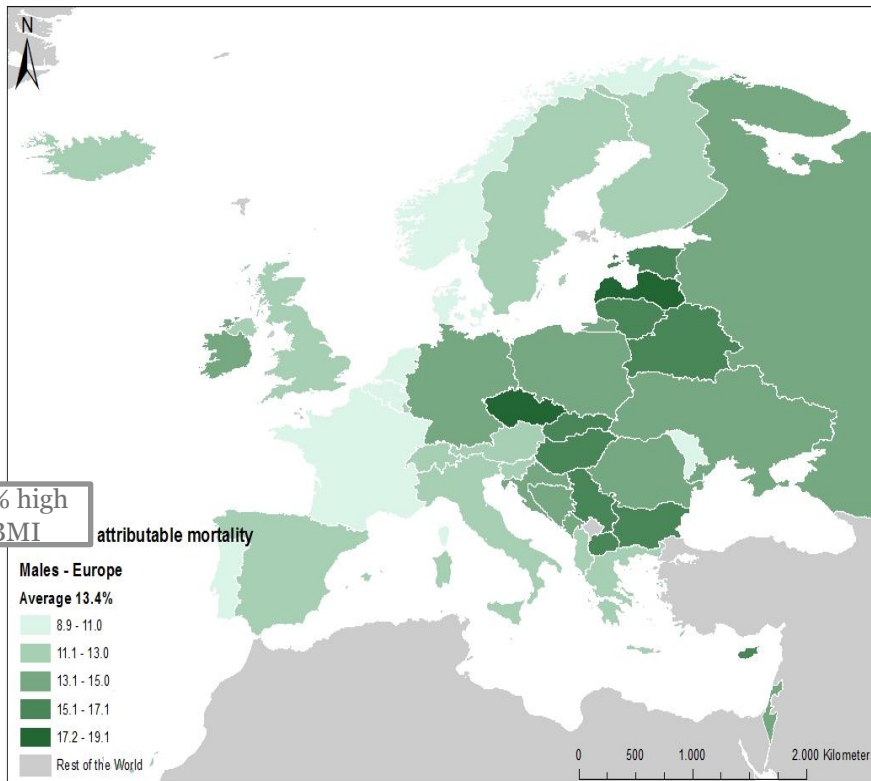


# % alcohol-attributable mortality in 2010





# % high-BMI-attributable mortality in 2010





# Lifestyle-attributable mortality

Percentage total deaths due to lifestyle in 2010		(Global Burden of Disease study 2010)			
		Nether-lands	Germany	Western Europe	Eastern Europe
Smoking	Men	26	21	21	26
	Women	13	10	9	4
High BMI	Men	10	14	12	15
	Women	11	16	12	20
Excessive alcohol consumption	Men	4	5	5	26
	Women	3	0	2	31

Source: IHME (2014)



# TIME-TRENDS

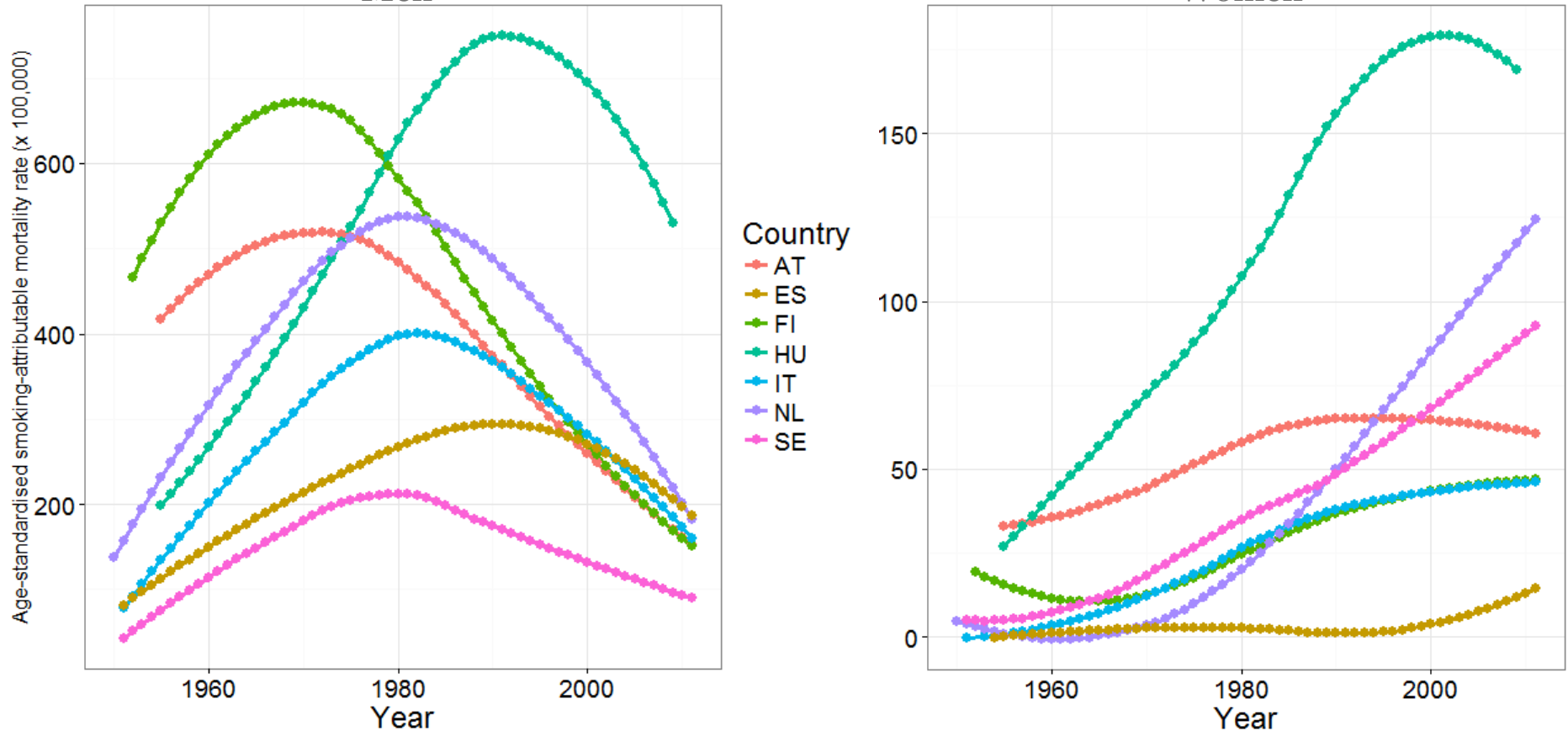




# Age-standardized smoking-attributable mortality rates (35-79)

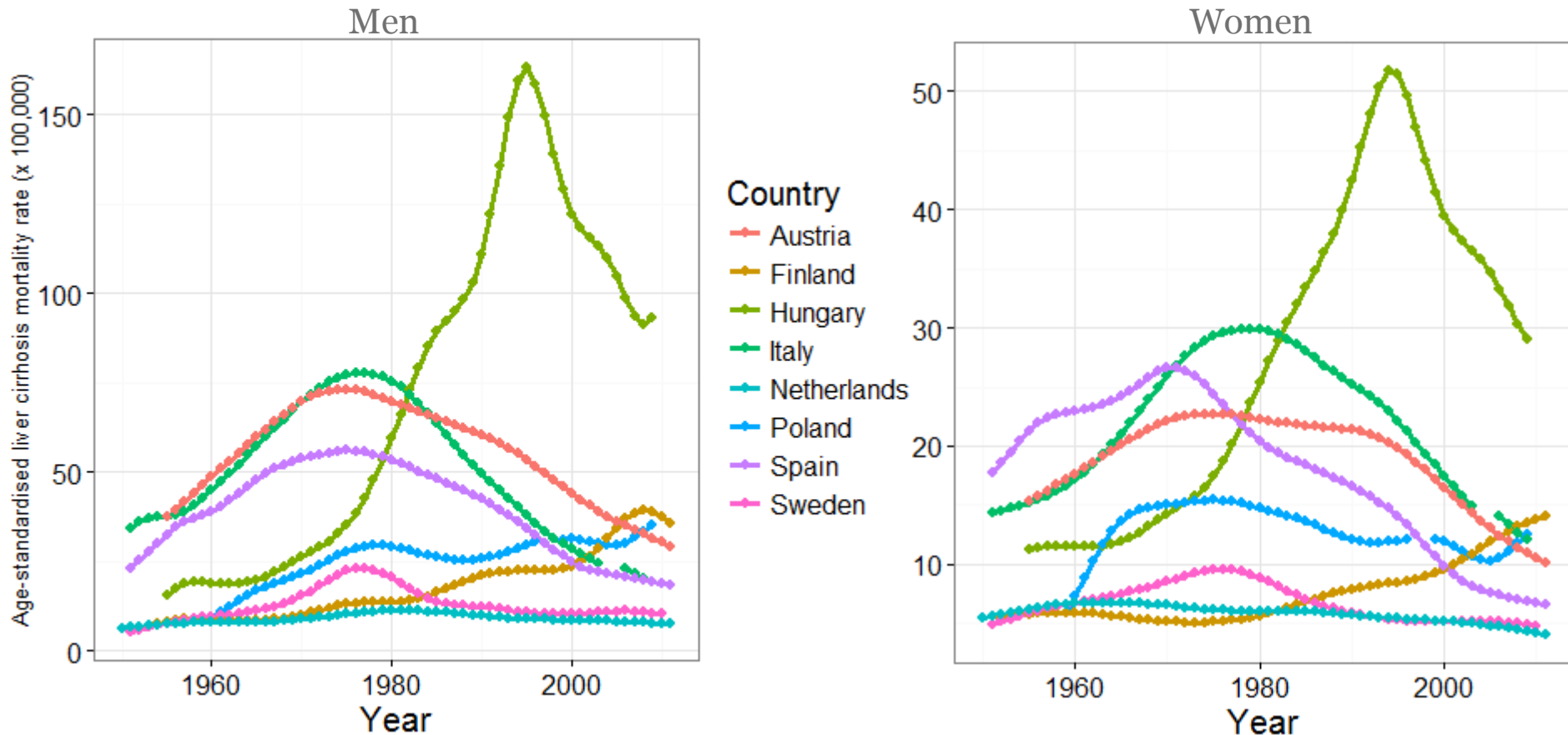
Men

Women





# Age-standardized liver cirrhosis mortality rates (15-94)

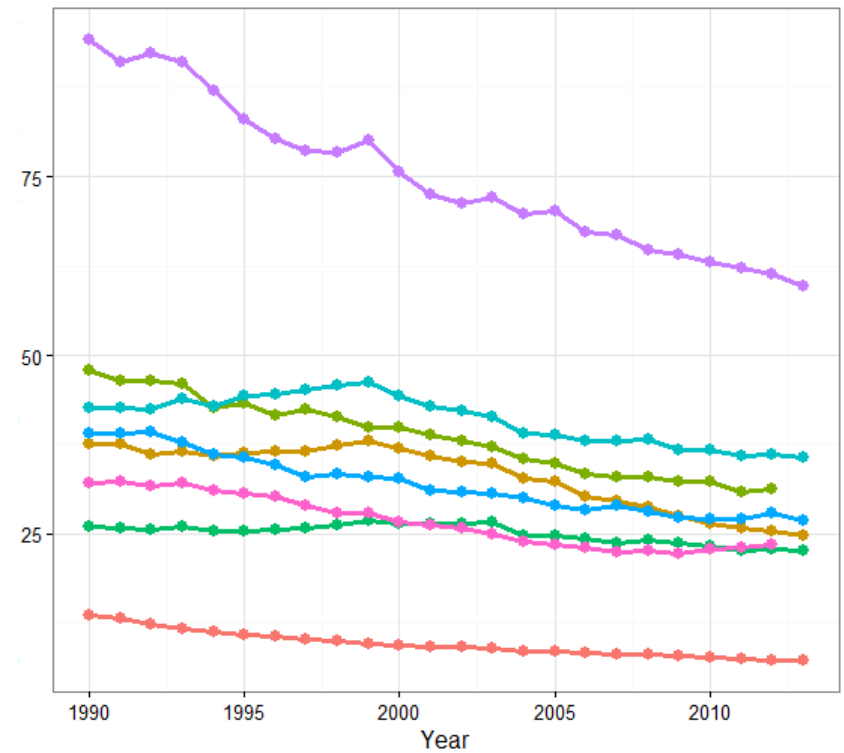
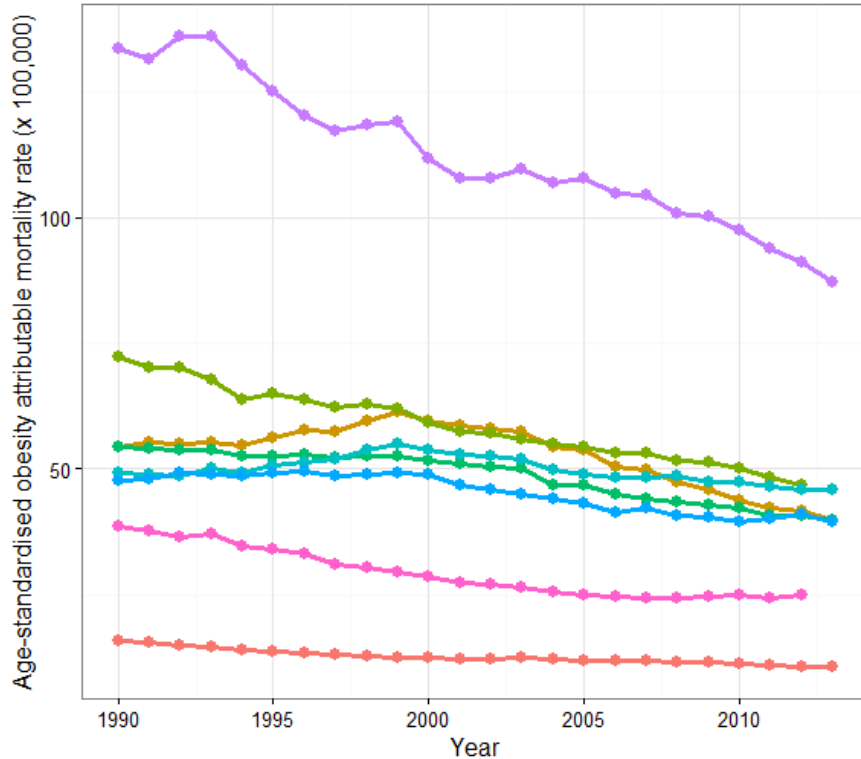




# Age-standardized obesity-attributable mortality rates (20-79)

Men

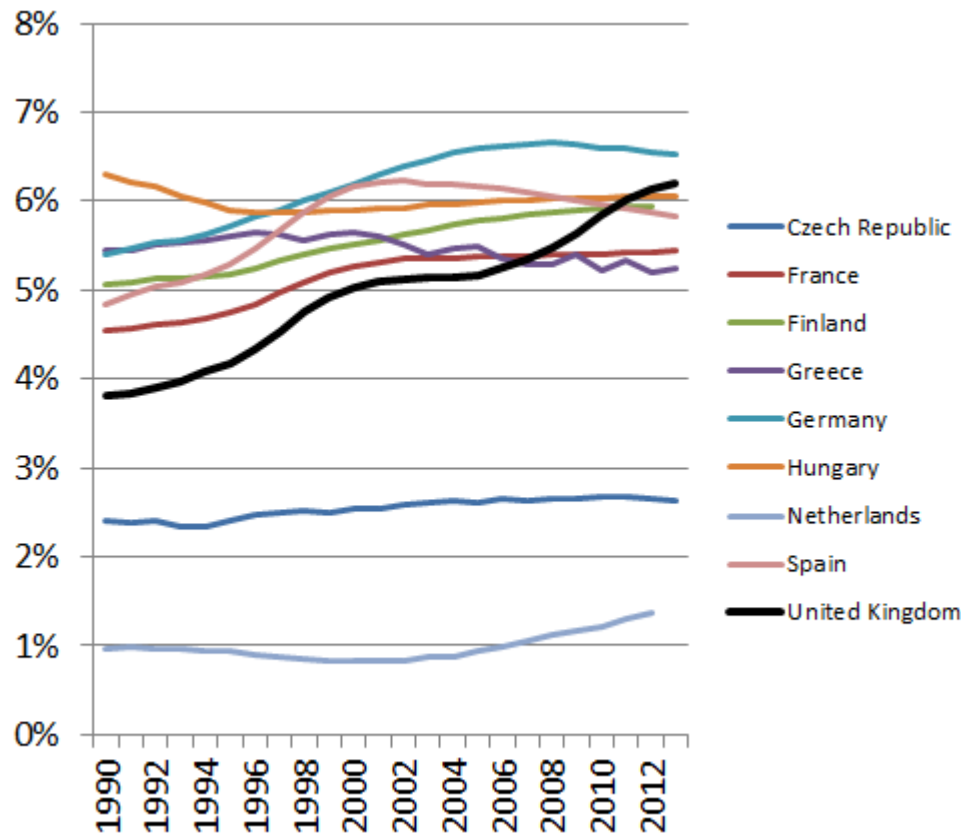
Women



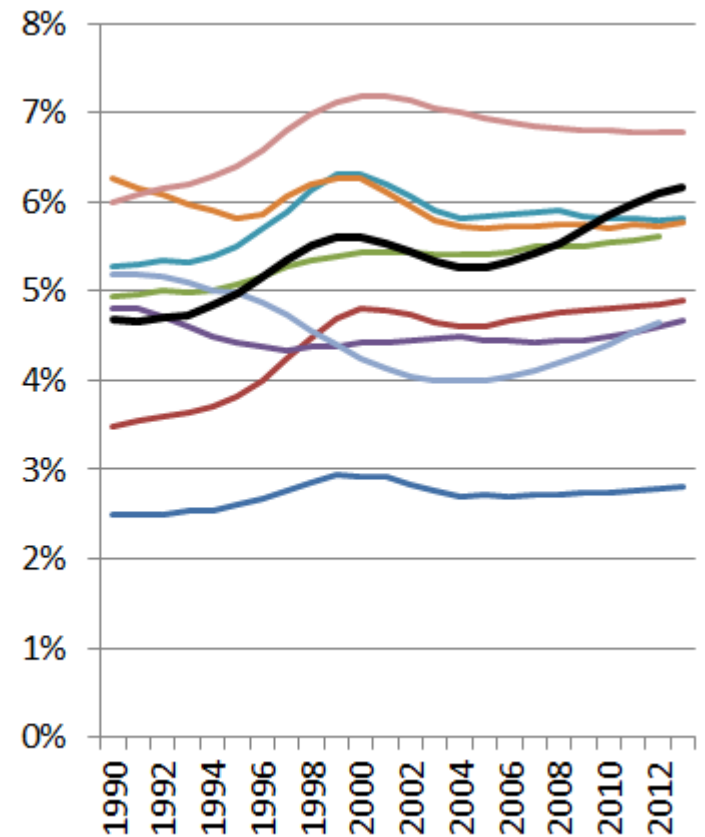


# Obesity-Attributable Fractions

Men



Women



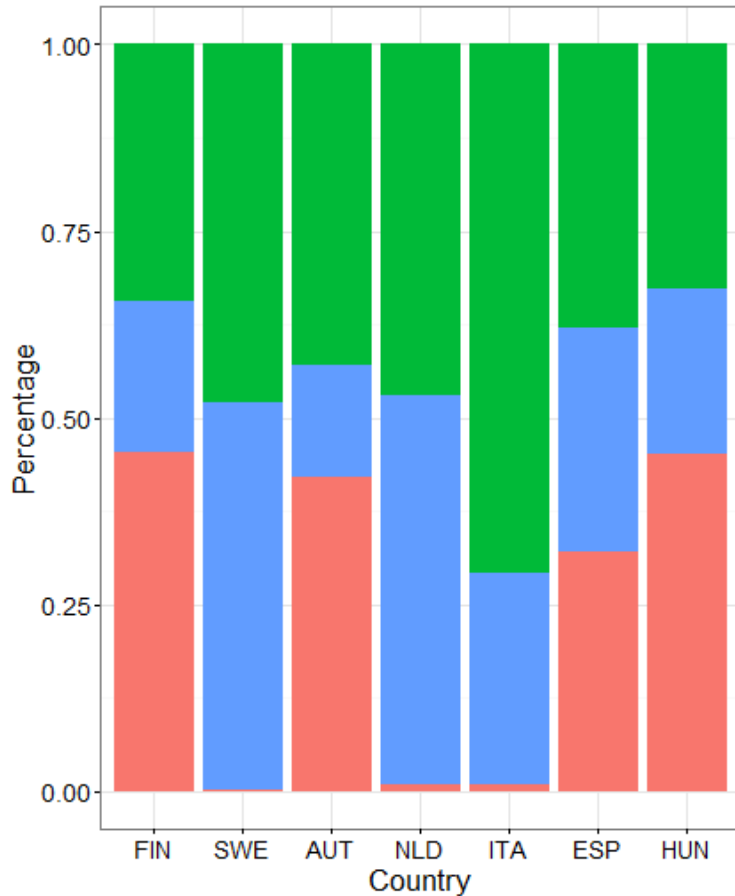


# RELEVANCE OF BIRTH COHORT

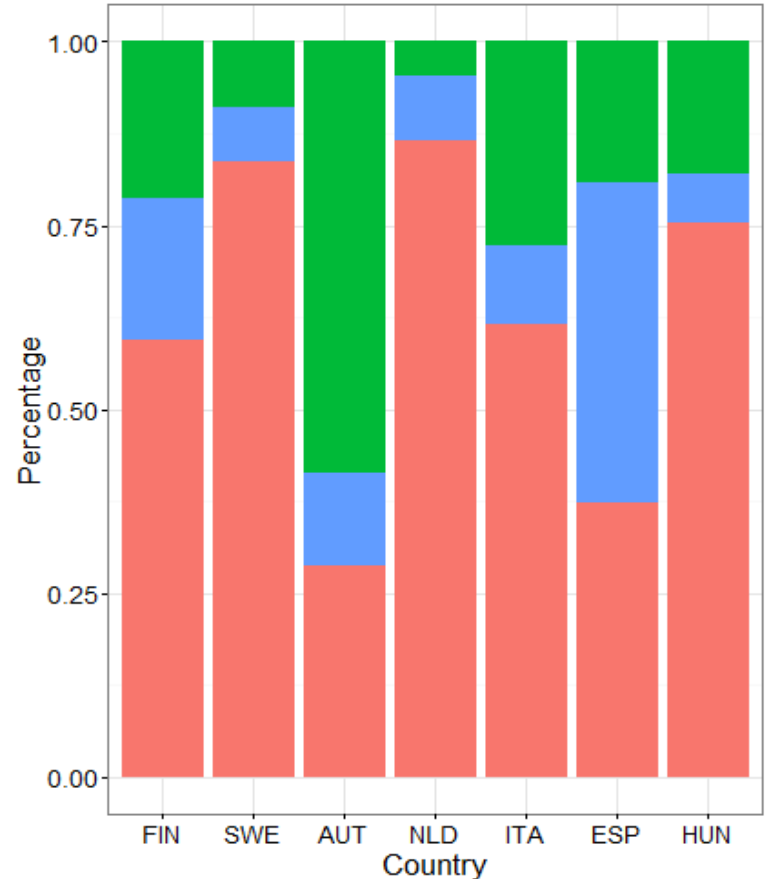


# Contribution to the deviance reduction: smoking

Men



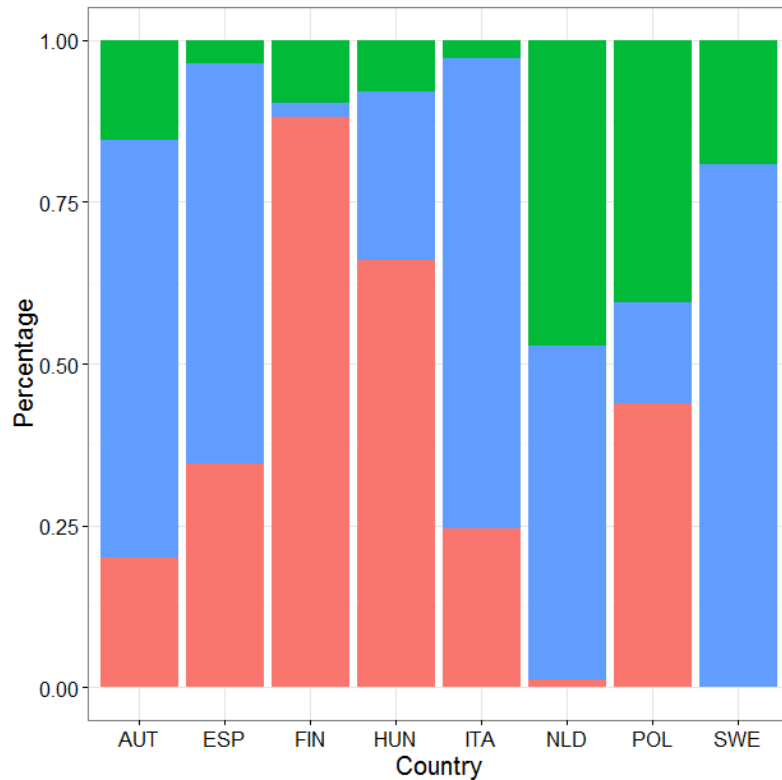
Women



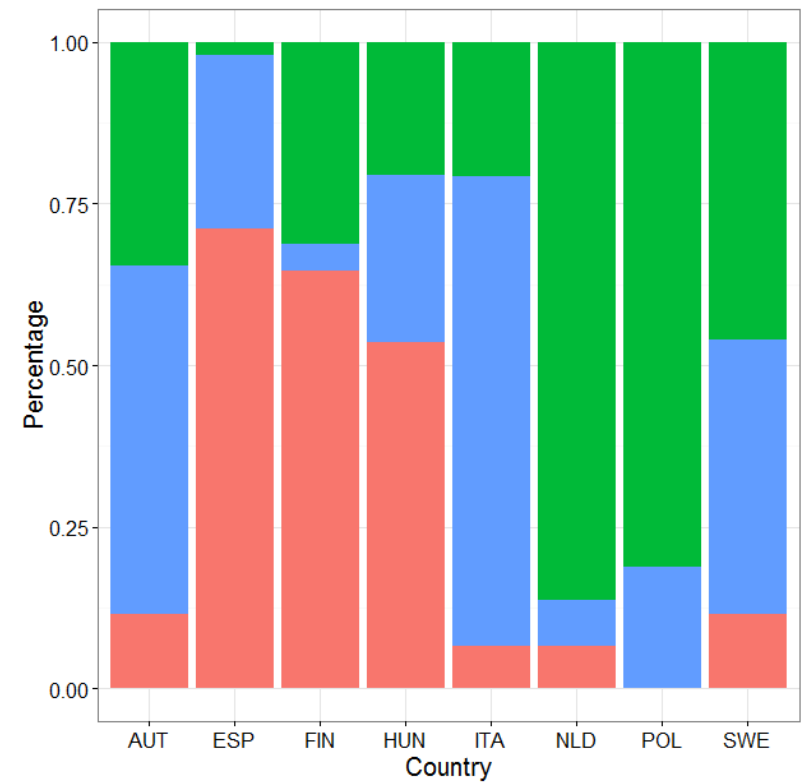


# Contribution to the deviance reduction: liver cirrhosis

Men



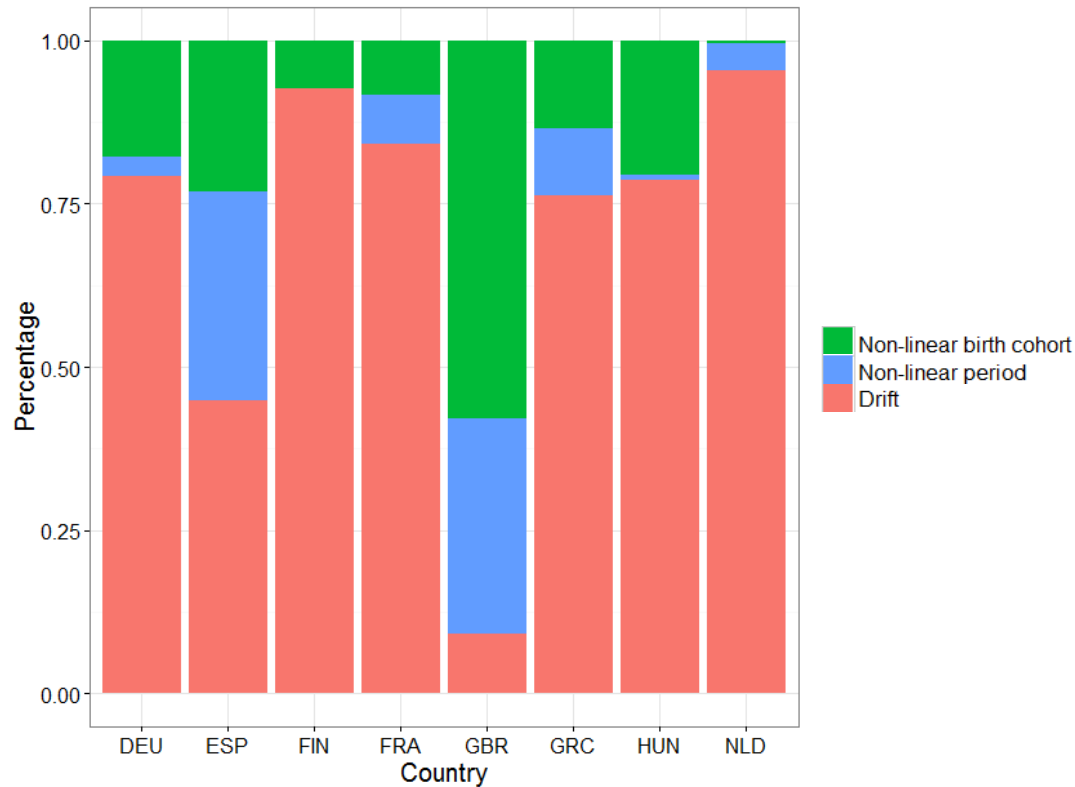
Women



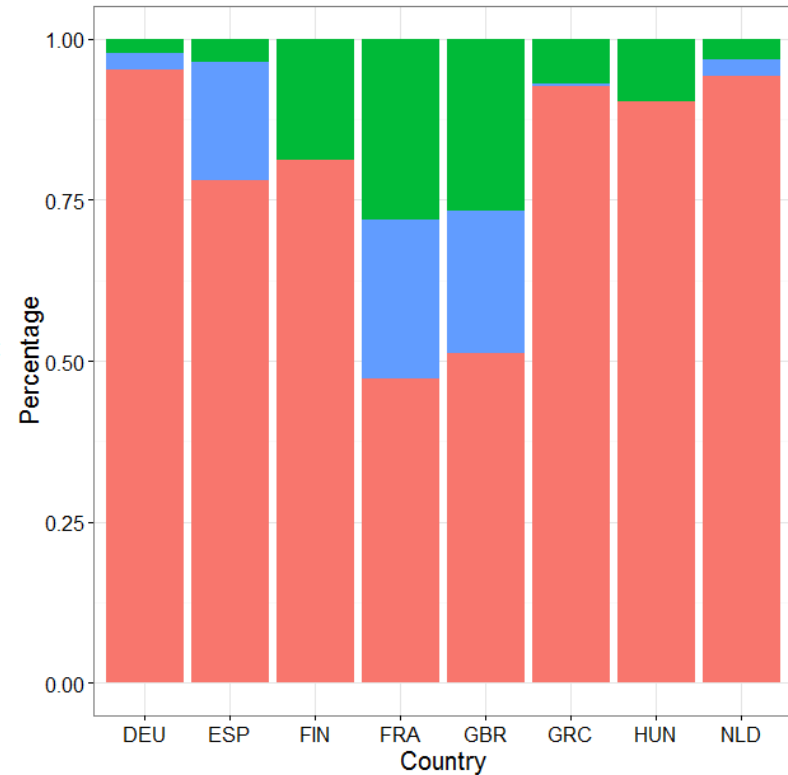


# Contribution to the deviance reduction: obesity

Men



Women



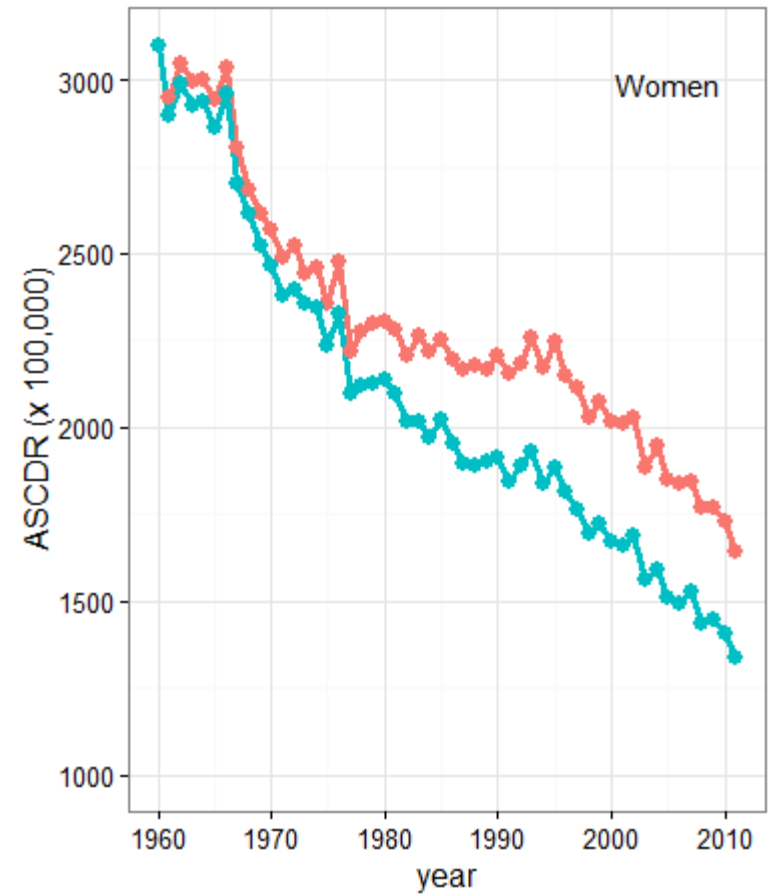
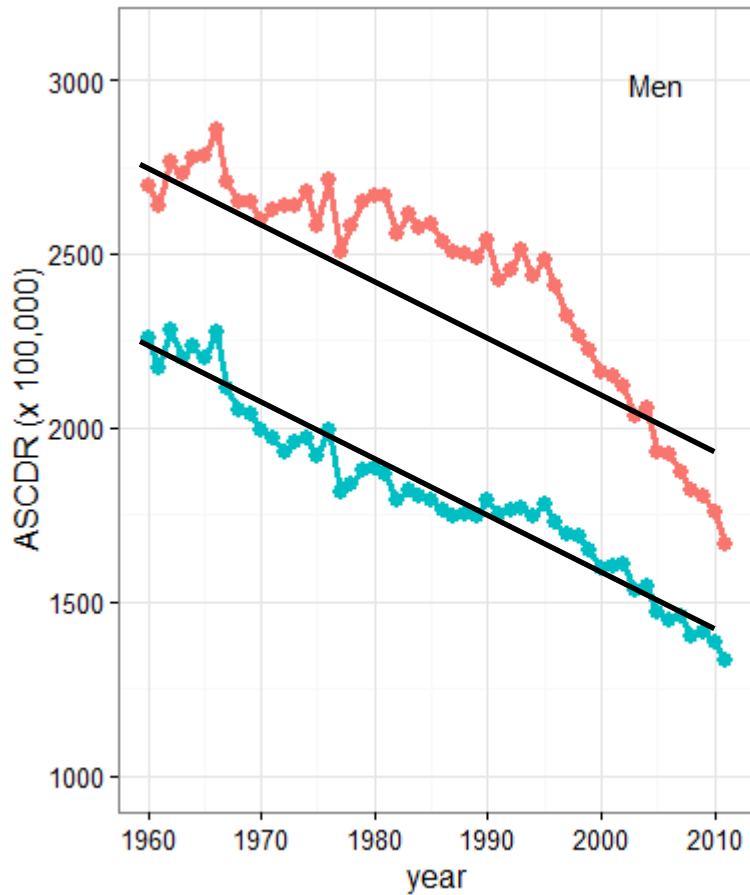




# Effect on all-cause mortality trends and differences

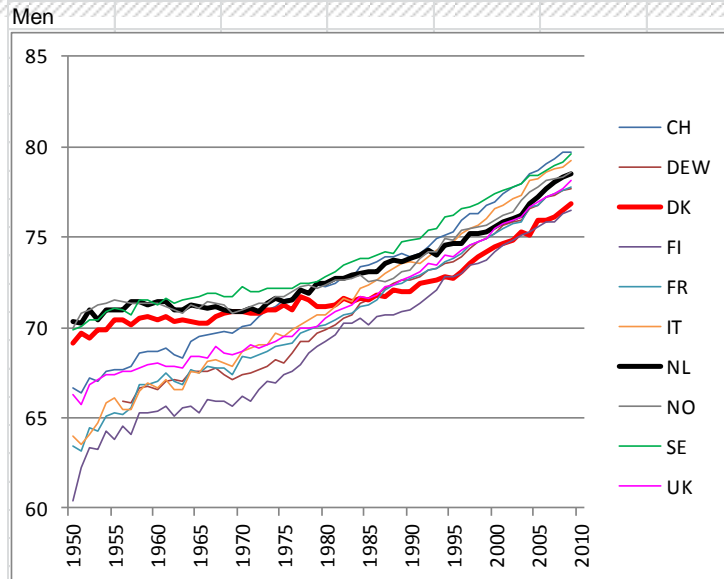


# Role of smoking in mortality trends: Denmark

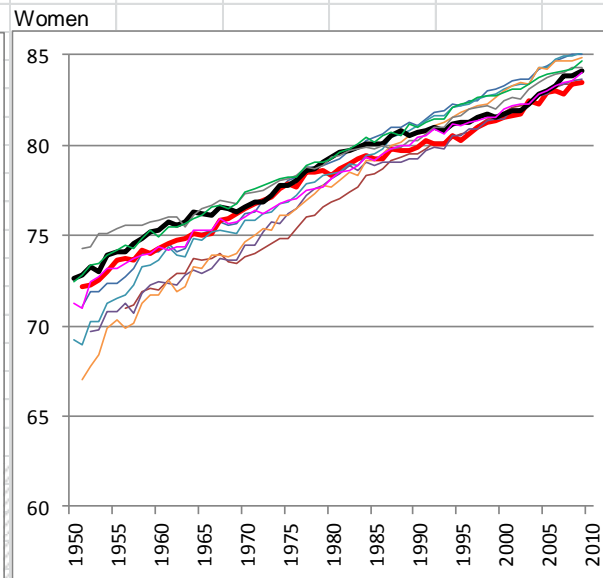
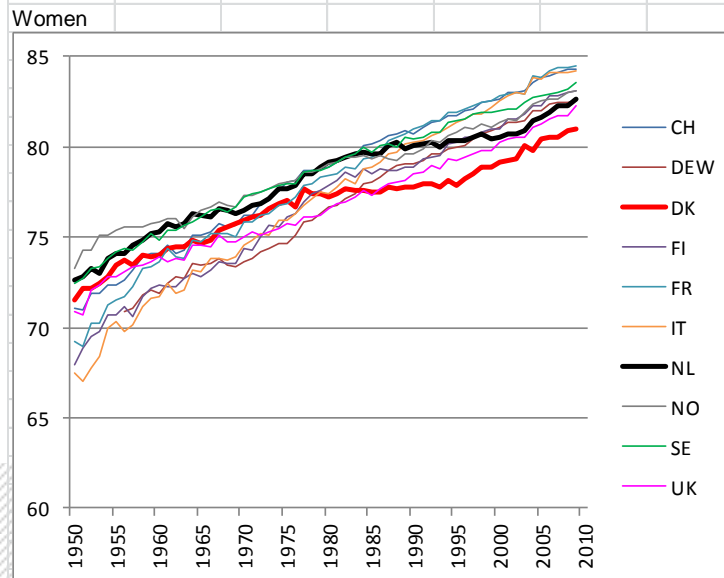
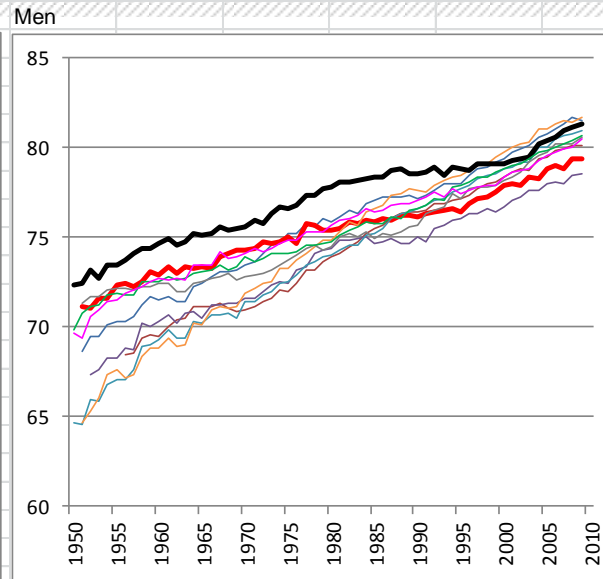


# Role of smoking in e<sub>0</sub> trends

## All-cause mortality

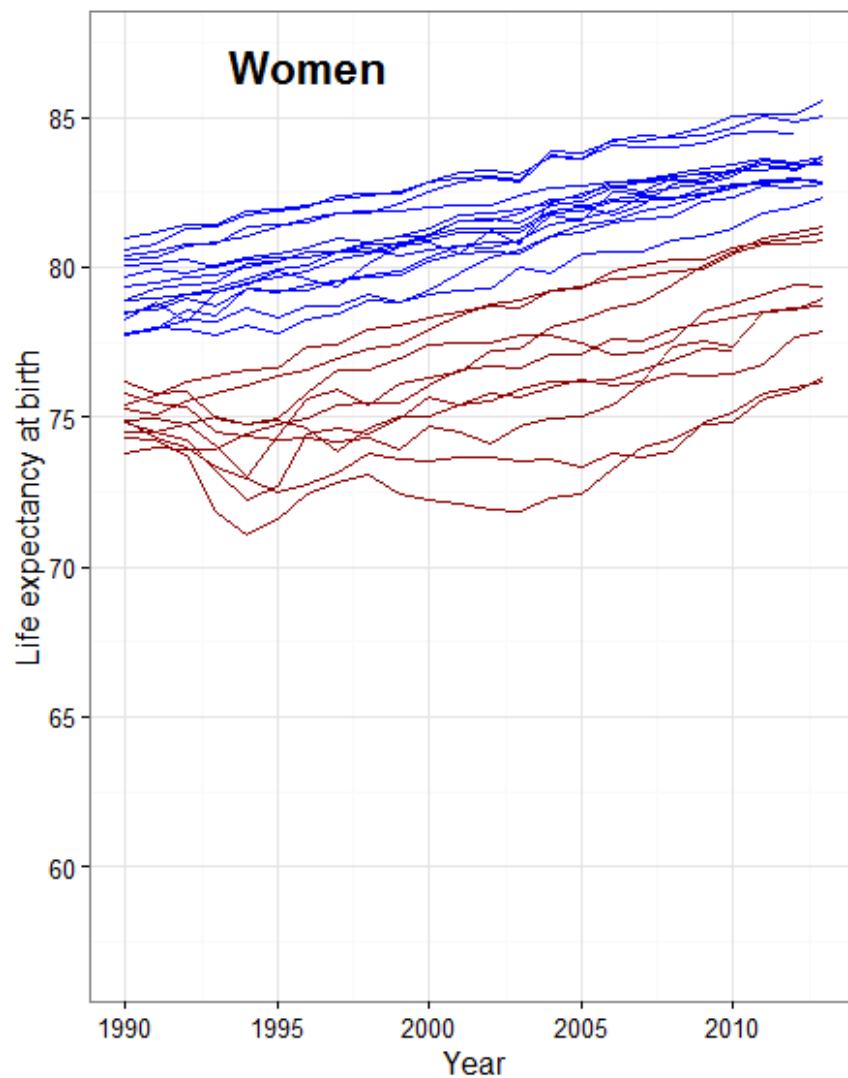
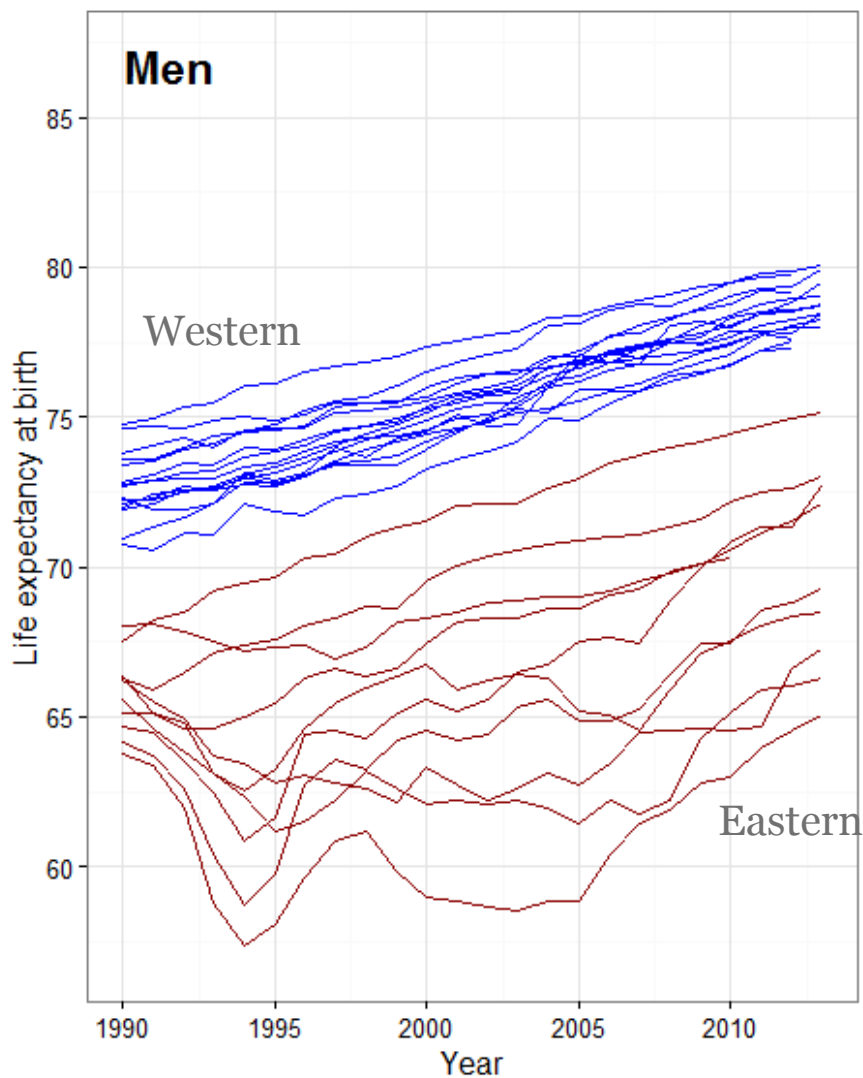


## Non-smoking-related mortality



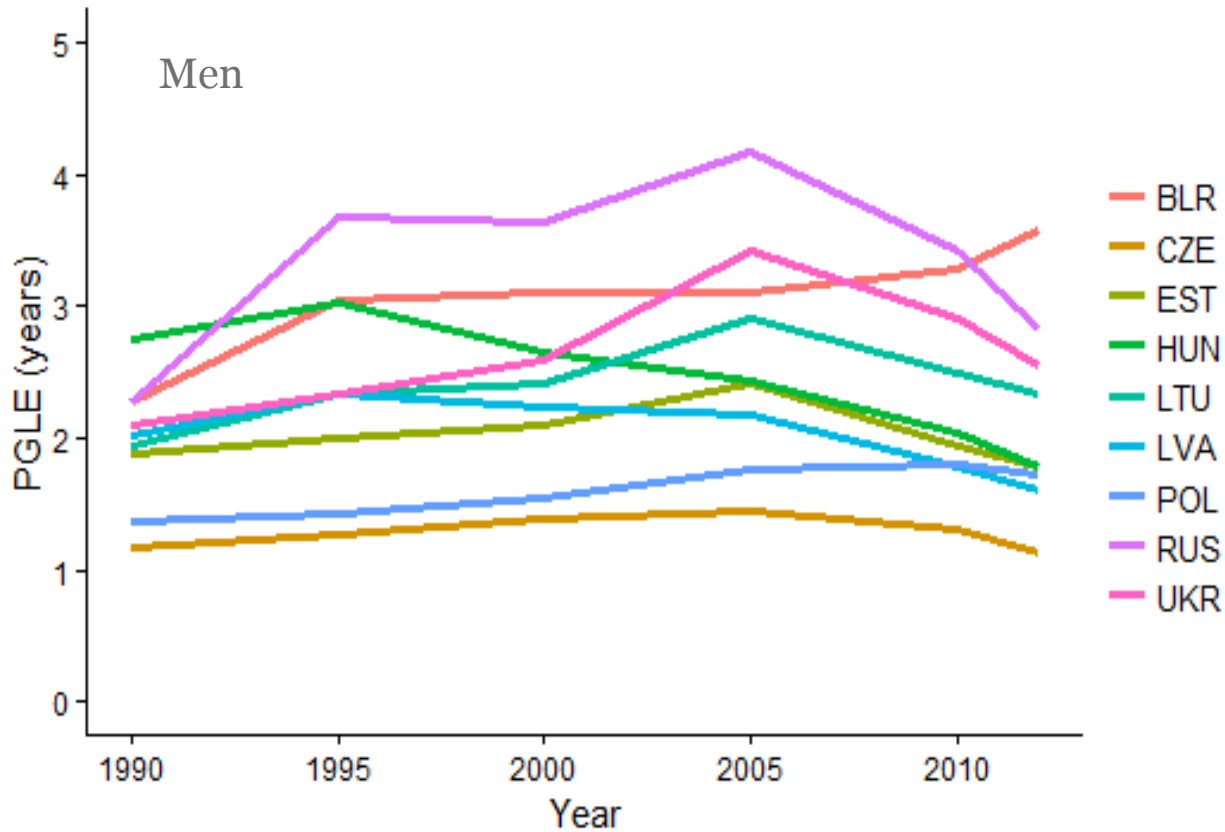


# Life expectancy in Europe





# PGLE by eliminating alcohol-attributable mortality



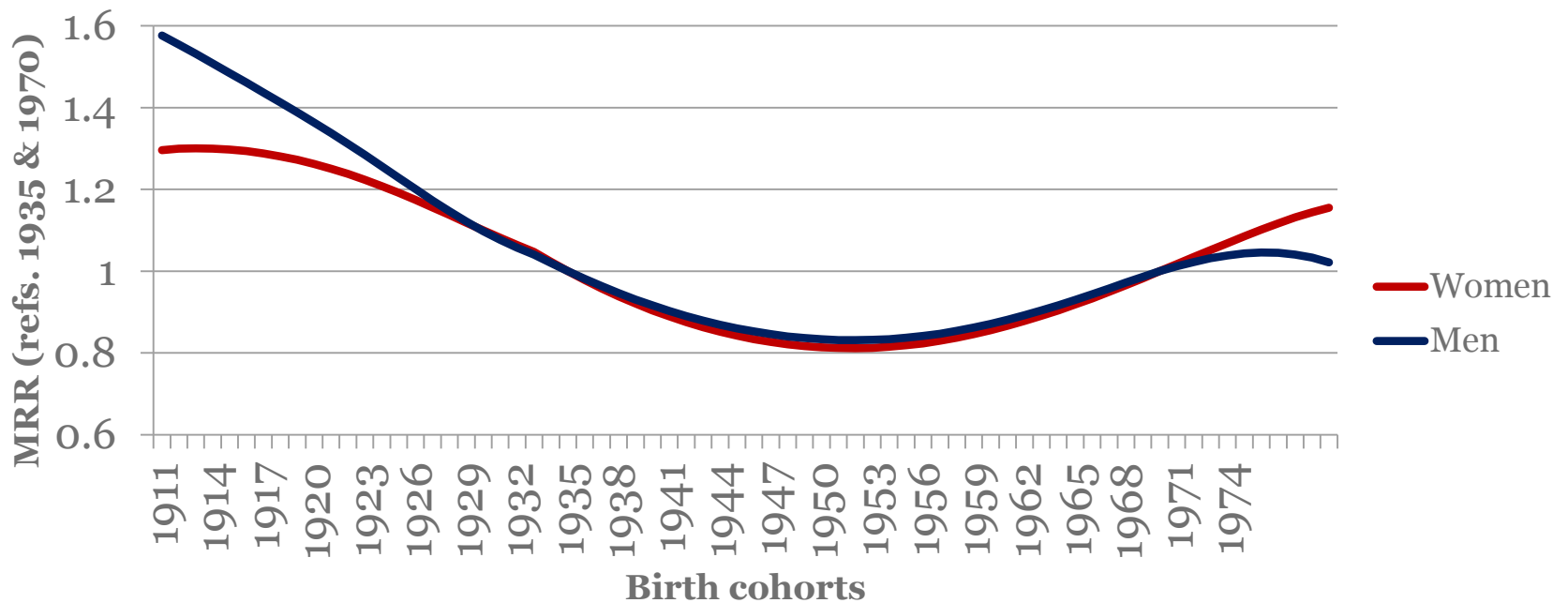
Trias-Llimós, S., A.E. Kunst & F. Janssen (in preparation), The role of alcohol in life expectancy differentials in Europe



# Obesity

- › Increase in prevalence & PAF, but decline in mortality

**Non-linear cohort effects UK**



Source: Vidra et al. *in preparation*



## To conclude

- › Clear variations between countries in the level of smoking-, alcohol- and obesity-attributable mortality. Smoking-attributable mortality most important
- › Substantial **differences across countries and between sexes** in the trends of the **smoking, alcohol and obesity epidemics** => different timing of epidemics
- › The **birth cohort dimension** proved essential when studying these epidemics
- › Importance for all-cause mortality
  - Time trends => more linear
    - Country and sex differences



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Thank you