

# Effect of trend estimates of the difference between survey respondents and non-respondents: results from 27 populations in the WHO MONICA Project

Hanna Tolonen (National Public Health Institute, Finland)

Annette Dobson (University of Queensland, Australia)

Sangita Kulathinal (National Public Health Institute, Finland)

for the WHO MONICA Project



# Background

- ❖ Sample surveys are often used in epidemiological research
- ❖ Non-response may cause bias to the results
  - ❖ Non-respondents are known to differ from respondents in socio-economic and health profiles
- ❖ Response rates in many surveys are declining



# Purpose of this study

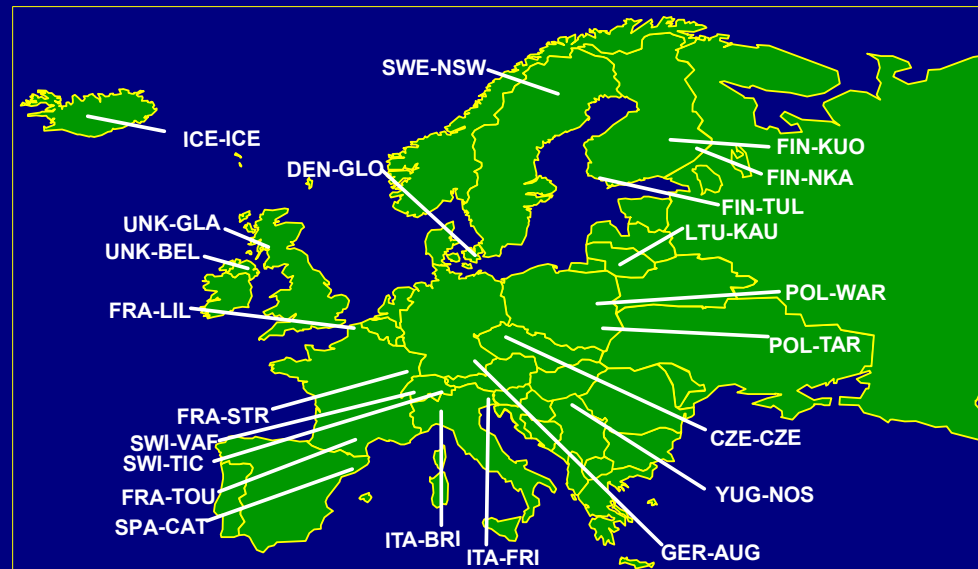
- ❖ Describe the socio-economic and health profiles of the non-respondents in comparison to the respondents
- ❖ Investigate the effect of non-response on
  - ❖ cross-sectional estimates, and
  - ❖ trend estimates



# Methods

- ❖ Data from the WHO MONICA Project risk factor surveys (<http://www.ktl.fi/monica>)
- ❖ 27 populations in 18 countries in 4 continents
- ❖ Age group 35-64

# Methods - Populations

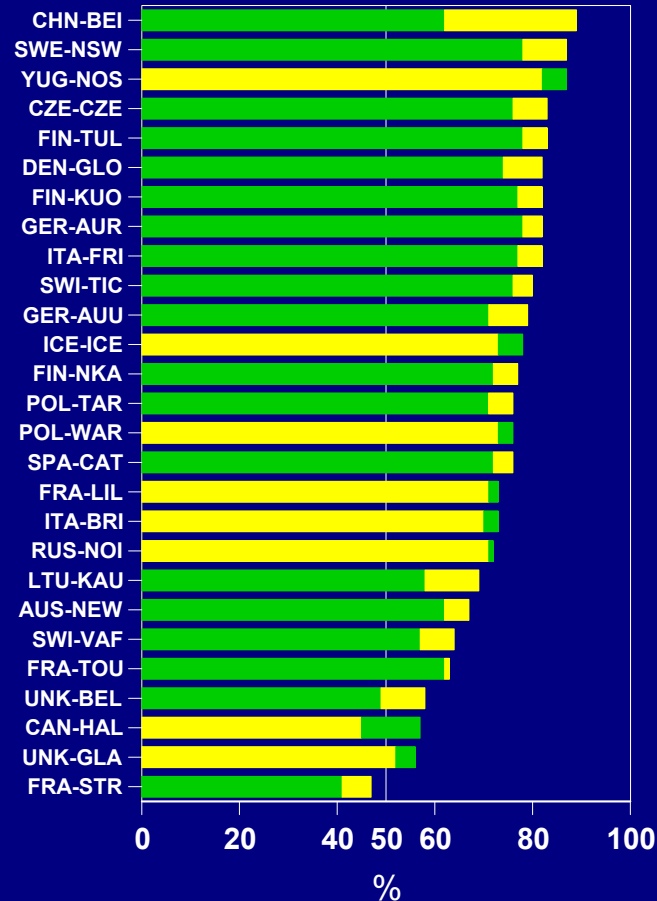


# Methods (2)

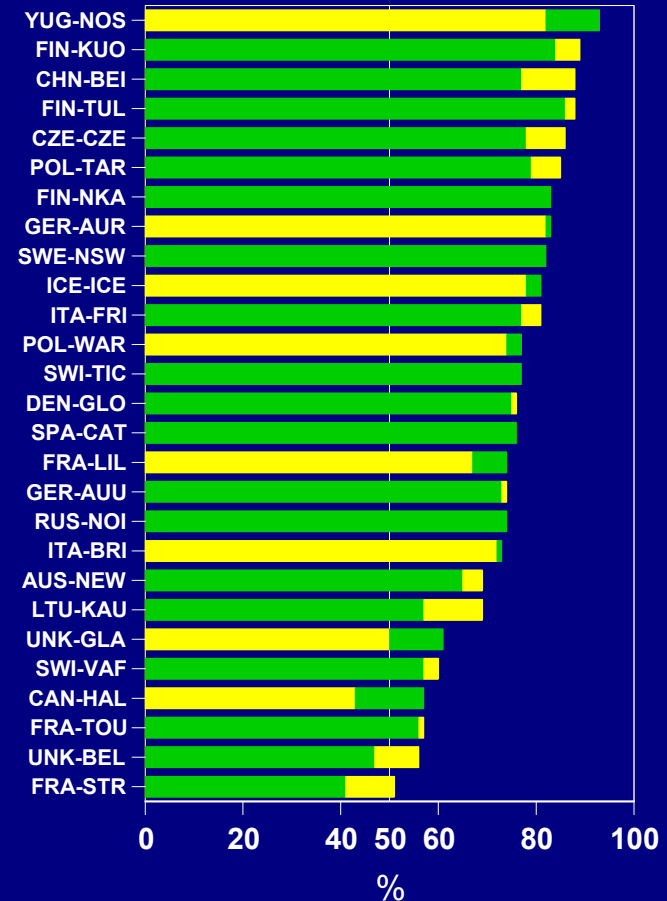
- ❖ Standardized data for both respondents and non-respondents
  - ❖ demographics (age, sex)
  - ❖ SES (marital status, educational level)
  - ❖ health status/behaviour (height, weight, smoking, awareness and treatment of hypertension)
- ❖ Availability of data among non-respondents varied from 0% to 98% depending on data item and population

# Response rate

Men



Women



Initial survey

Final survey

# Statistical methods

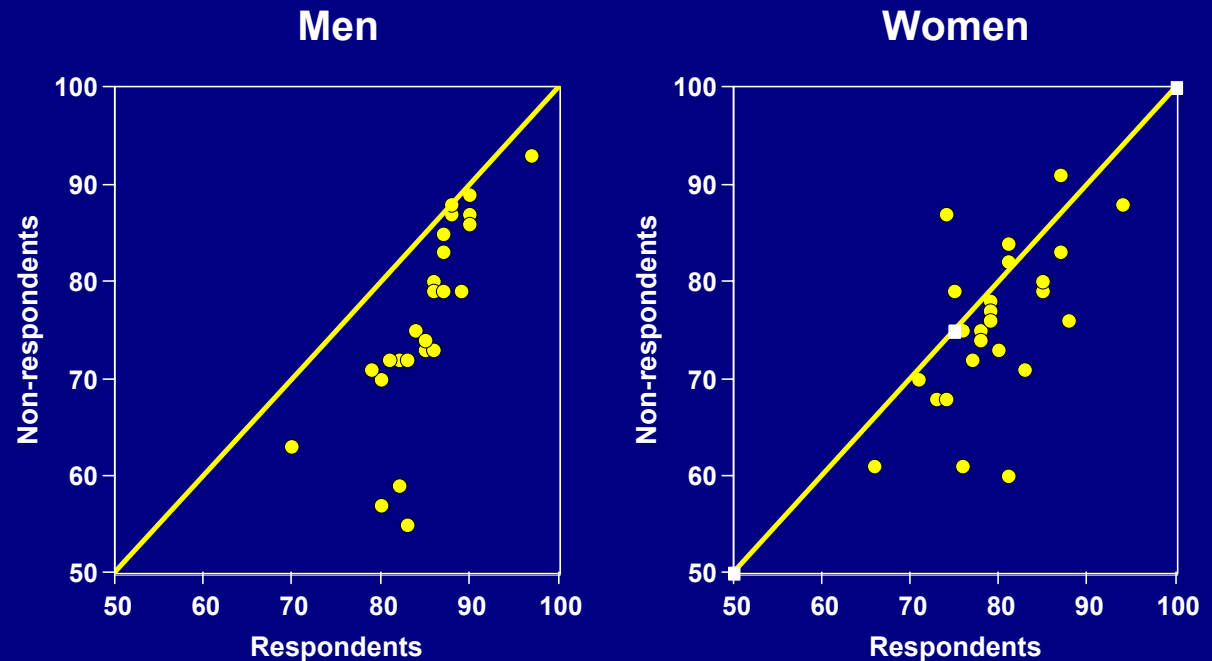
- ❖ Effect of non-response on the population estimates:

$$\text{Pop} = rr \times R + (1-rr) \times NR$$

where  $rr$  is the response rate

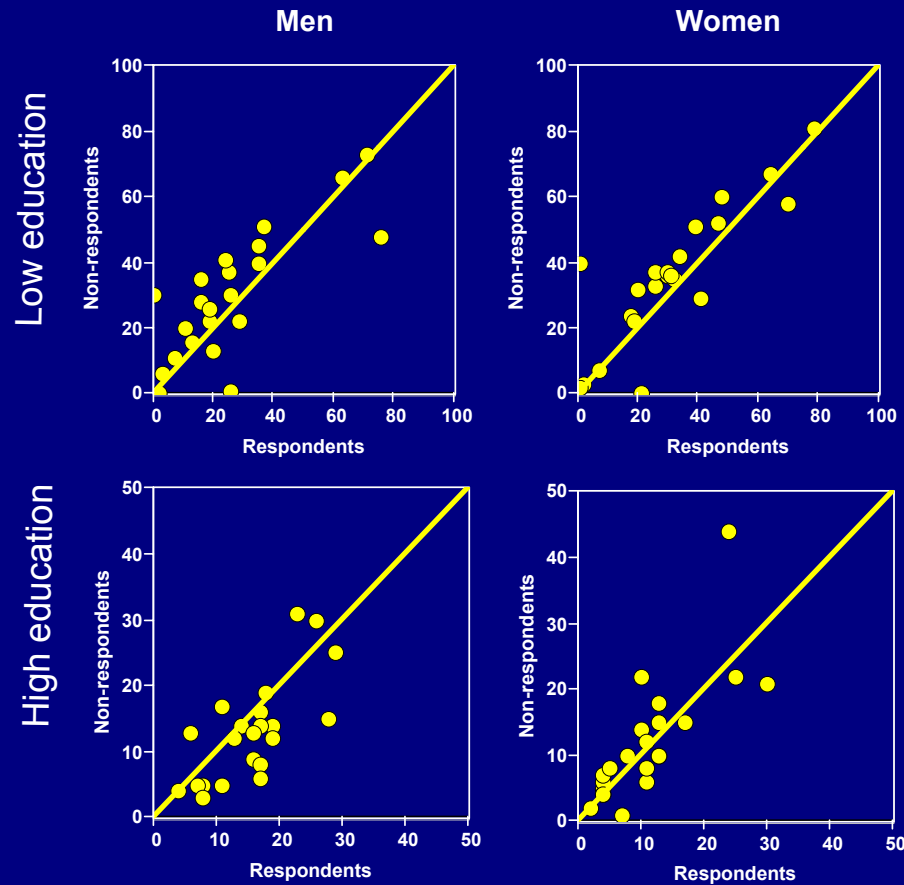
- ❖ Compared with estimate from respondents

# Proportion (%) married or cohabited



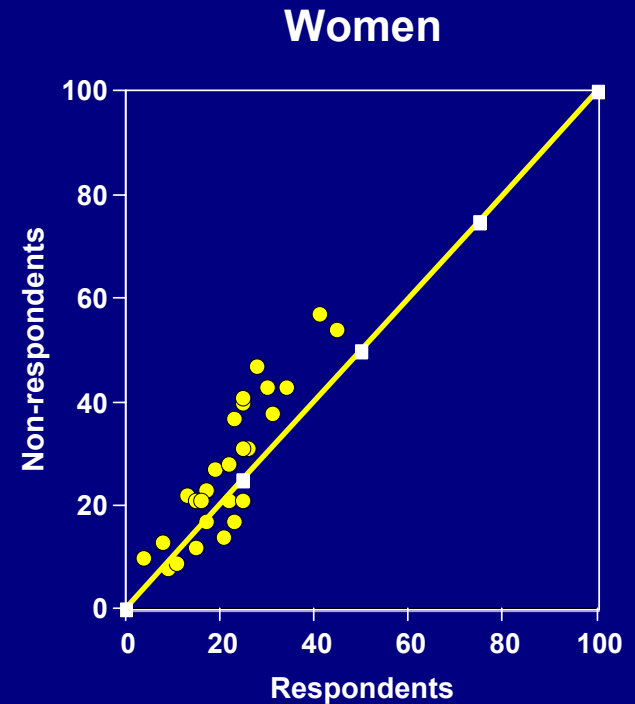
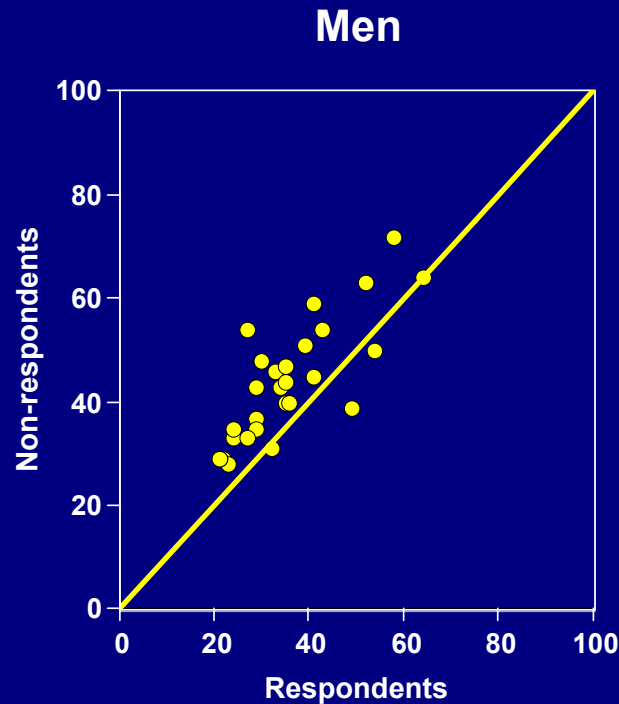
Non-respondents were more often single than respondents

# Proportion (%) with low and high education



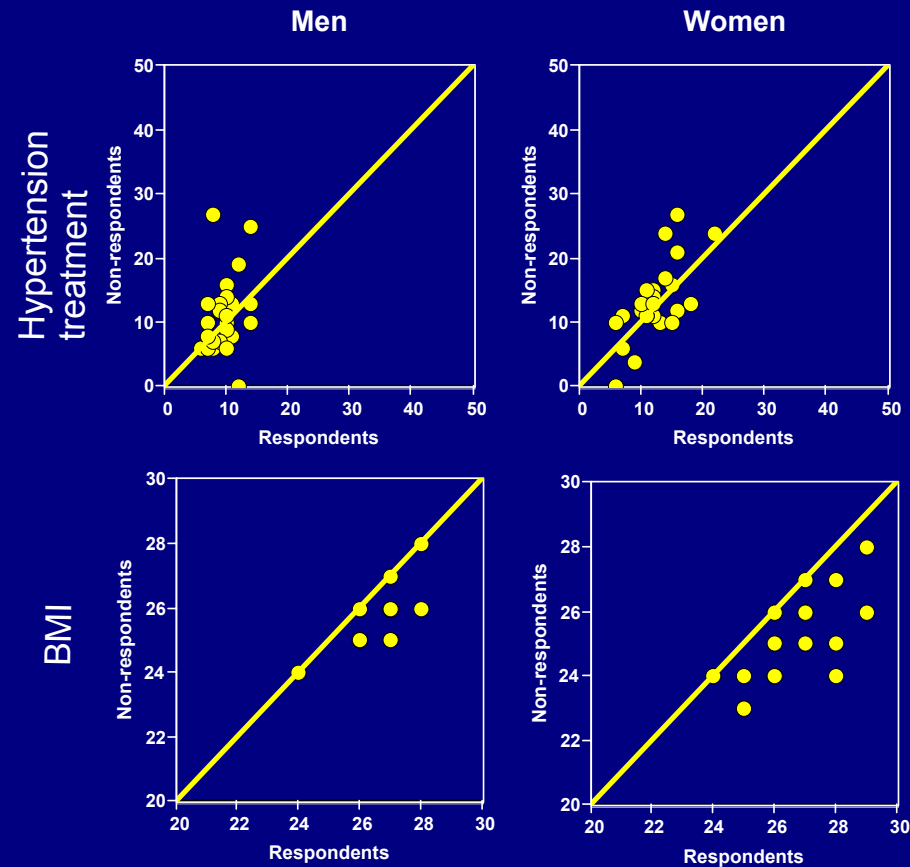
Non-respondents had lower education than respondents

# Proportion (%) of daily smoking



Non-respondents were more often daily smokers than respondents

# Proportion (%) of hypertension treatment and mean BMI




Non-respondents were more often on hypertension treatment and had lower BMI than respondents



# Respondents vs. non-respondents

- ❖ The difference in marital status, educational level and prevalence of daily smoking was smaller in women than in men
- ❖ The difference in the prevalence of hypertension drug treatment and BMI was bigger in women than in men
- ❖ The differences between respondents and non-respondents were not uniform between educational levels
  - ❖ Prevalence of daily smoking differed most among highly educated



# Respondents vs. adjusted population estimates

- ❖ Respondents tend to

- ❖ over-estimate

- ❖ % of married and cohabiting,

- ❖ % using hypertension drug treatment, and

- ❖ % being highly educated

- ❖ under-estimate

- ❖ % of daily smokers, and

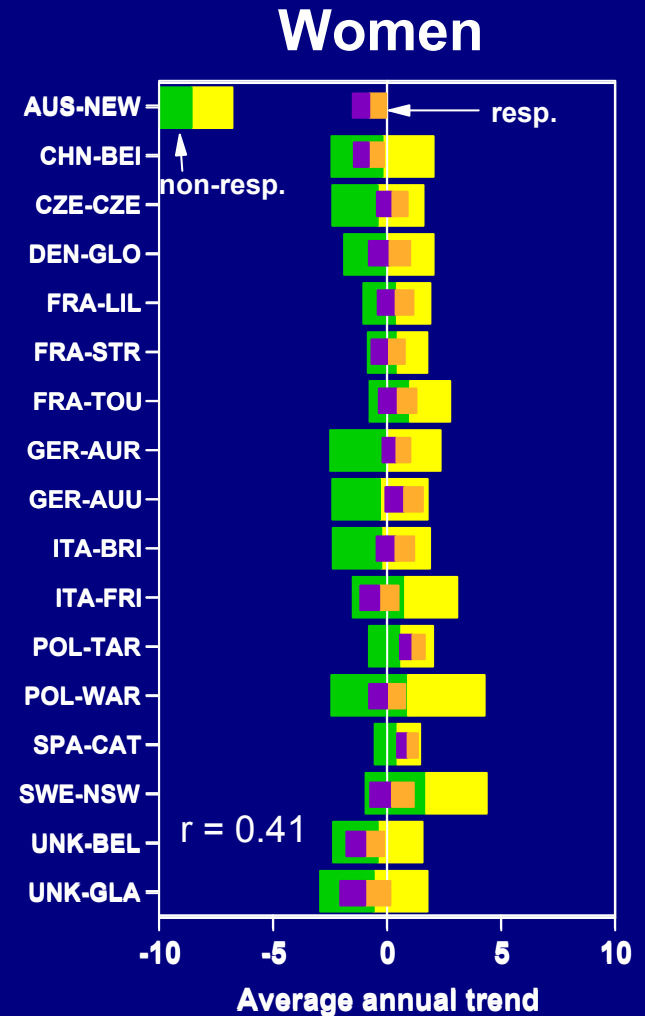
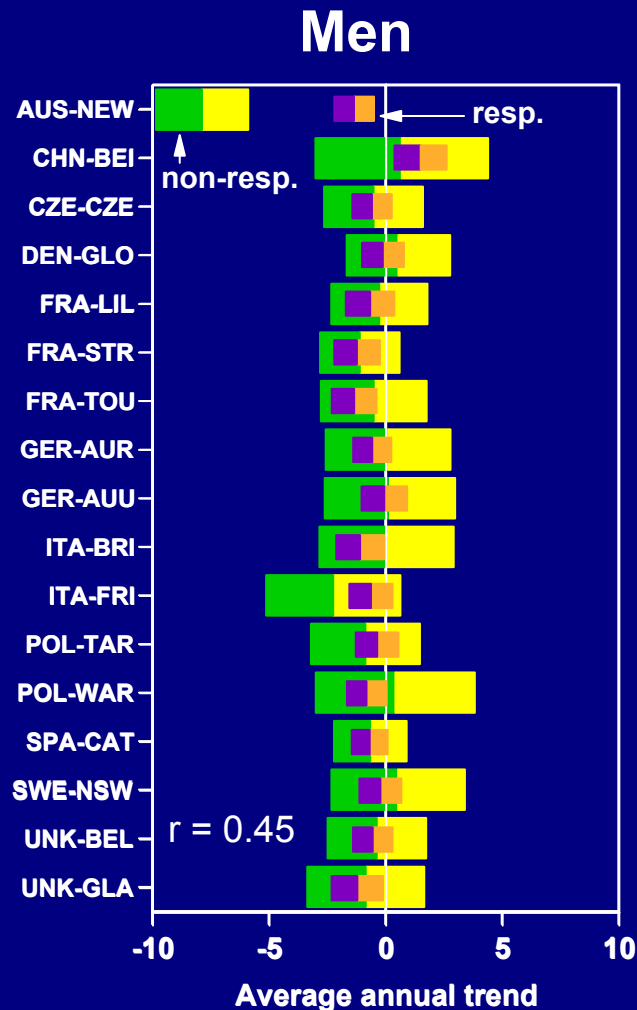
- ❖ % having low education

- ❖ provide similar estimates for BMI

when compared to adjusted population estimates

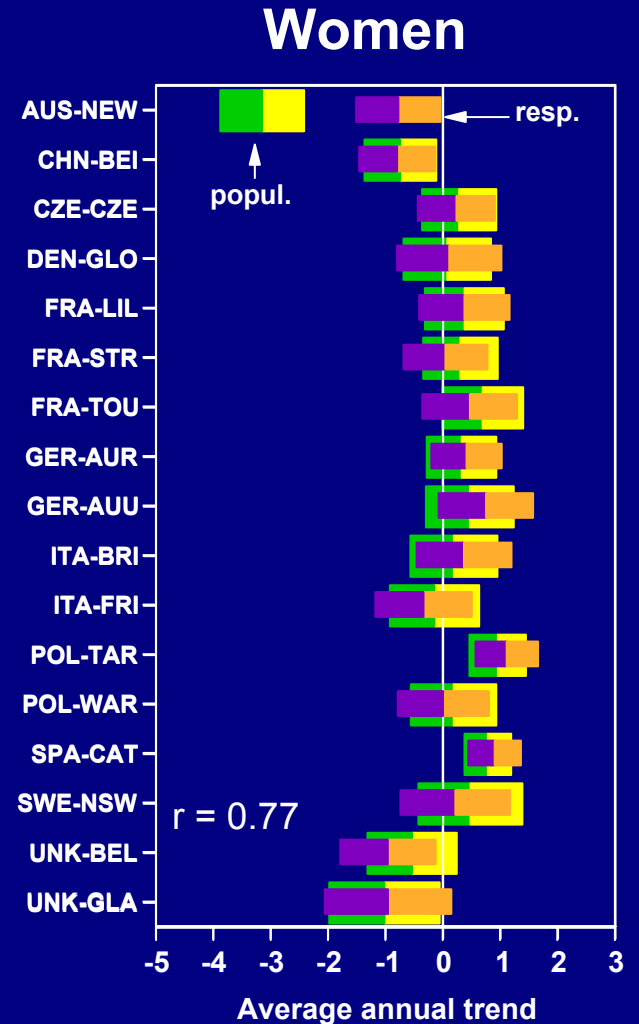
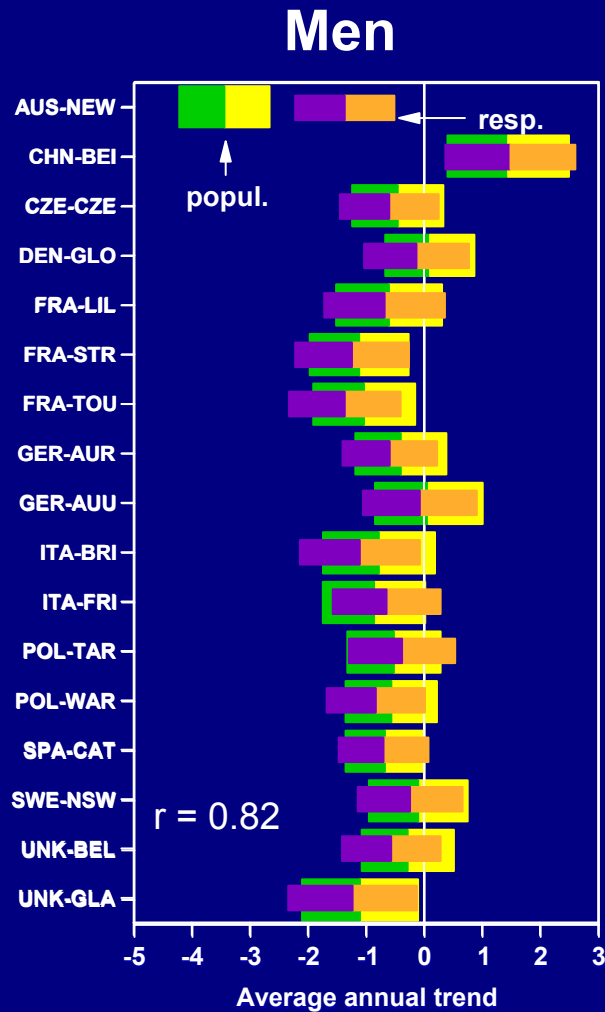
# Trend in daily smoking

## Respondents vs. non-respondents



# Trend in daily smoking

## Respondents vs. adjusted population estimates





# Conclusions

- ❖ Respondents and non-respondents differ from each other
  - ❖ non-respondents are more often young, unmarried men with low education and daily smokers
  - ❖ the differences are smaller among women
- ❖ Declining response rates may seriously bias both cross-sectional and trend estimates
  - ❖ especially if the non-respondent pattern changes between the surveys



**Thank you!**