International trends in health inequalities – how can we explain the differences?

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#PHINS2018

NHS Health Scotland

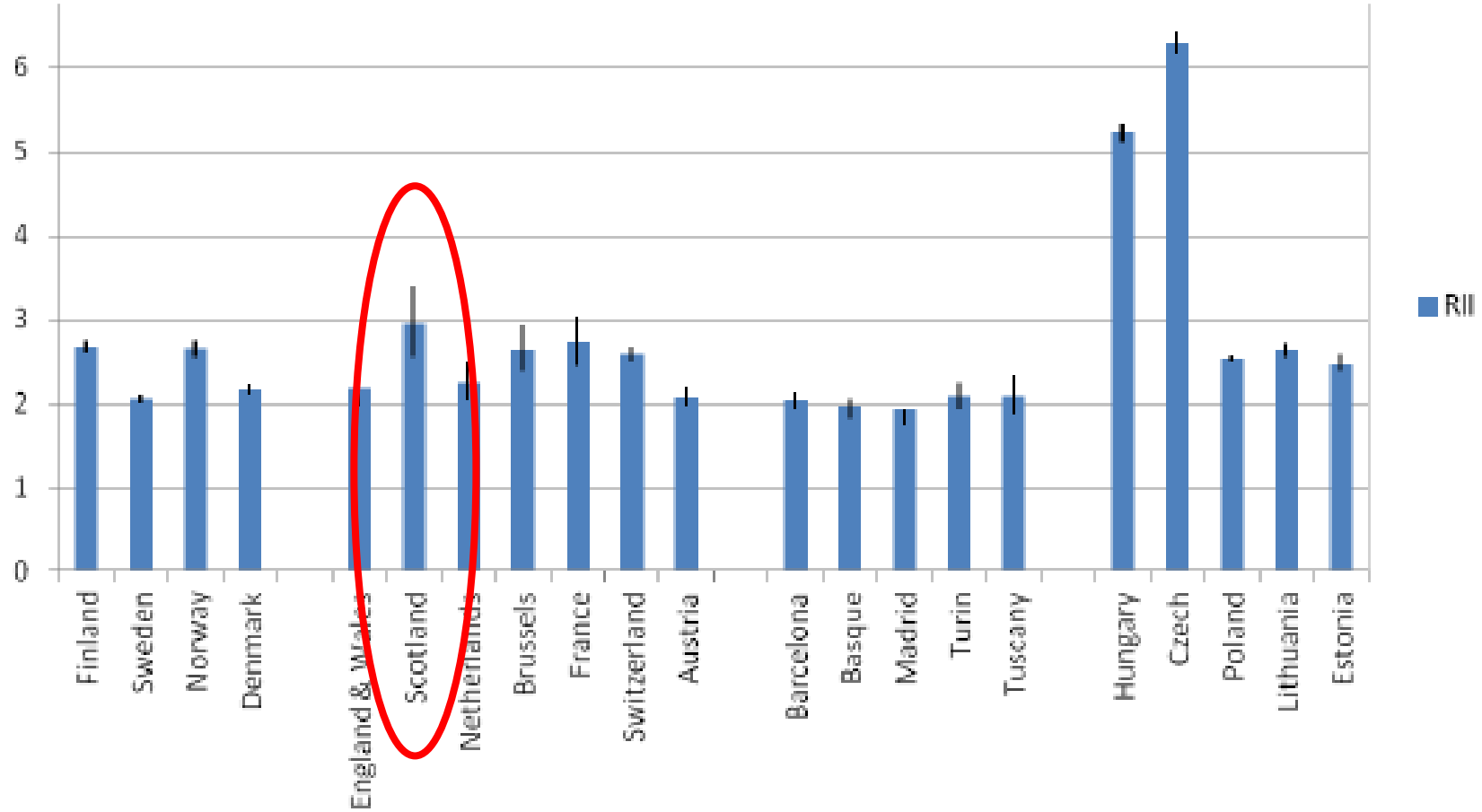
A systematic review of international mortality inequality trends

PHINS 2018

Background

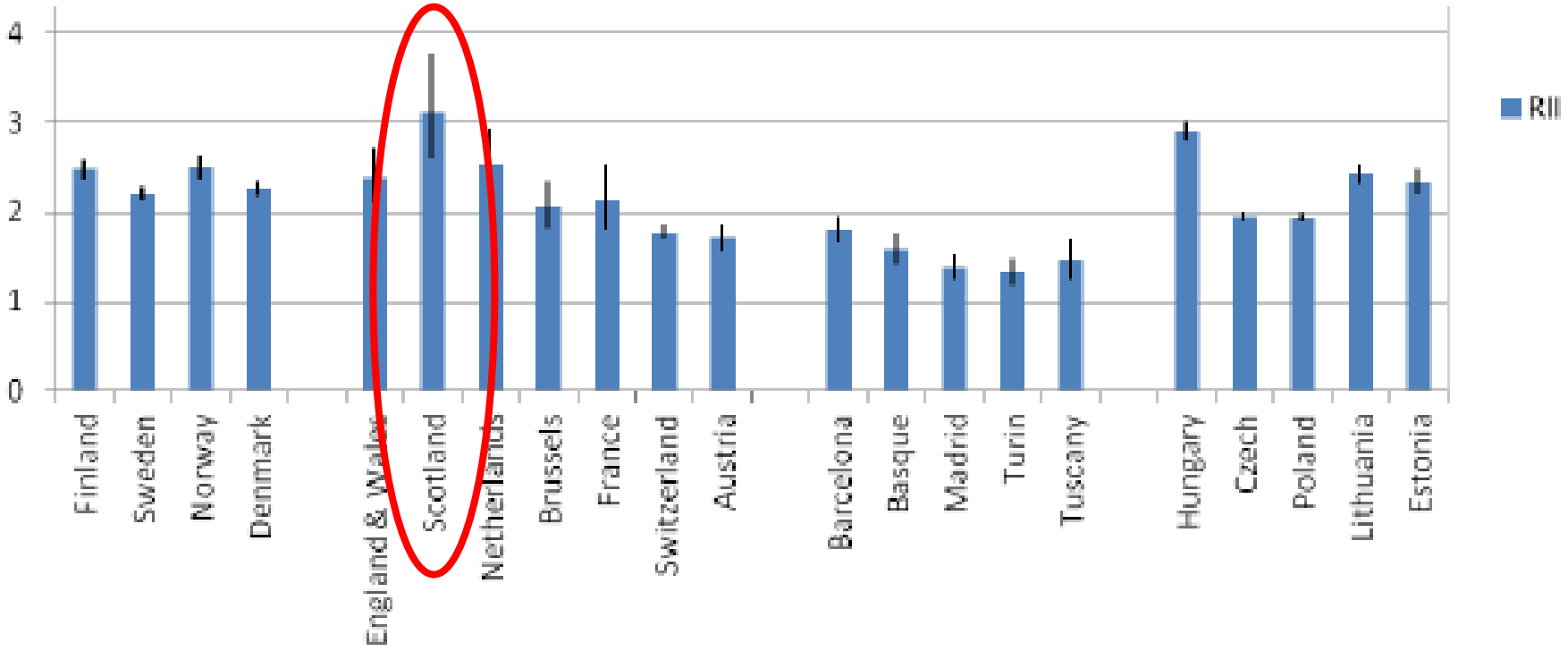
- Health inequalities in Scotland are known to be wider than in the rest of Central and Western Europe

Education based Relative Index of Inequality (RII) for all-cause mortality, males 30-74 years, early to mid 2000s



Source: Eikemo T.A. & Mackenbach J.P. (Eds). EURO GBD SE: the potential for reduction of health inequalities in Europe. Final Report. University Medical Center Rotterdam, 2012

Education based Relative Index of Inequality (RII) for all-cause mortality, females 30-74 years, early to mid 2000s



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Background

- Health inequalities in Scotland are known to be wider than in the rest of Central and Western Europe
- Understanding which nations have experienced improvements or worsening of health inequalities can inform policymaking

Purpose of this study

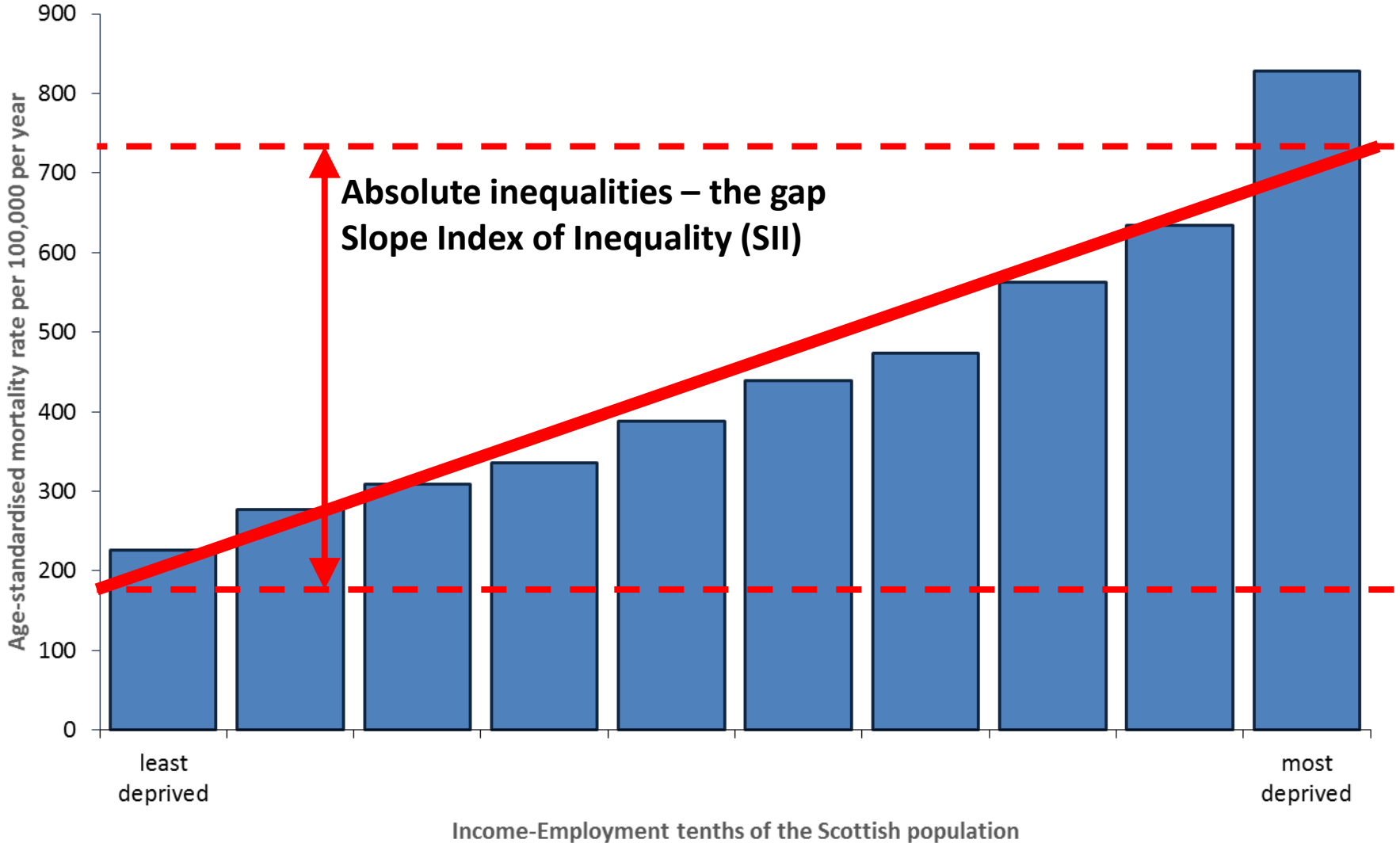
1. To describe the trends in inequalities in mortality and life expectancy amongst adults in high and upper-middle income countries across a range of measures of socioeconomic position.
2. To examine how mortality inequalities relate to a range of socioeconomic and political exposures at national level.

Methods

- Systematic review
- Comprehensive search of databases and grey literature
- Inclusion criteria:
  - all-cause mortality, life expectancy or survival
  - Nations with a population of >1 million inhabitants
  - ‘high income’ or ‘upper-middle income’ in 2010 only
  - Data ranked by deprivation, education, class, occupation, income or wealth
  - Proportion of population and outcome for each group, or summary measure (RII/SII) available

- Exclusion criteria:
  - Population sample does not attempt to be representative (excludes >20% from sample frame)
  - <18 year olds only
  - Ranking of socioeconomic position is not possible
  - Data over-adjusted (e.g. for self-rated health)
- Critical appraisal
  - Modified Hamilton tool to assess and classify studies for the risk of bias
- Calculation of the Slope Index of Inequality (SII) and Relative Index of Inequality (RII)

Mortality rate for those aged under 75 years, 2015



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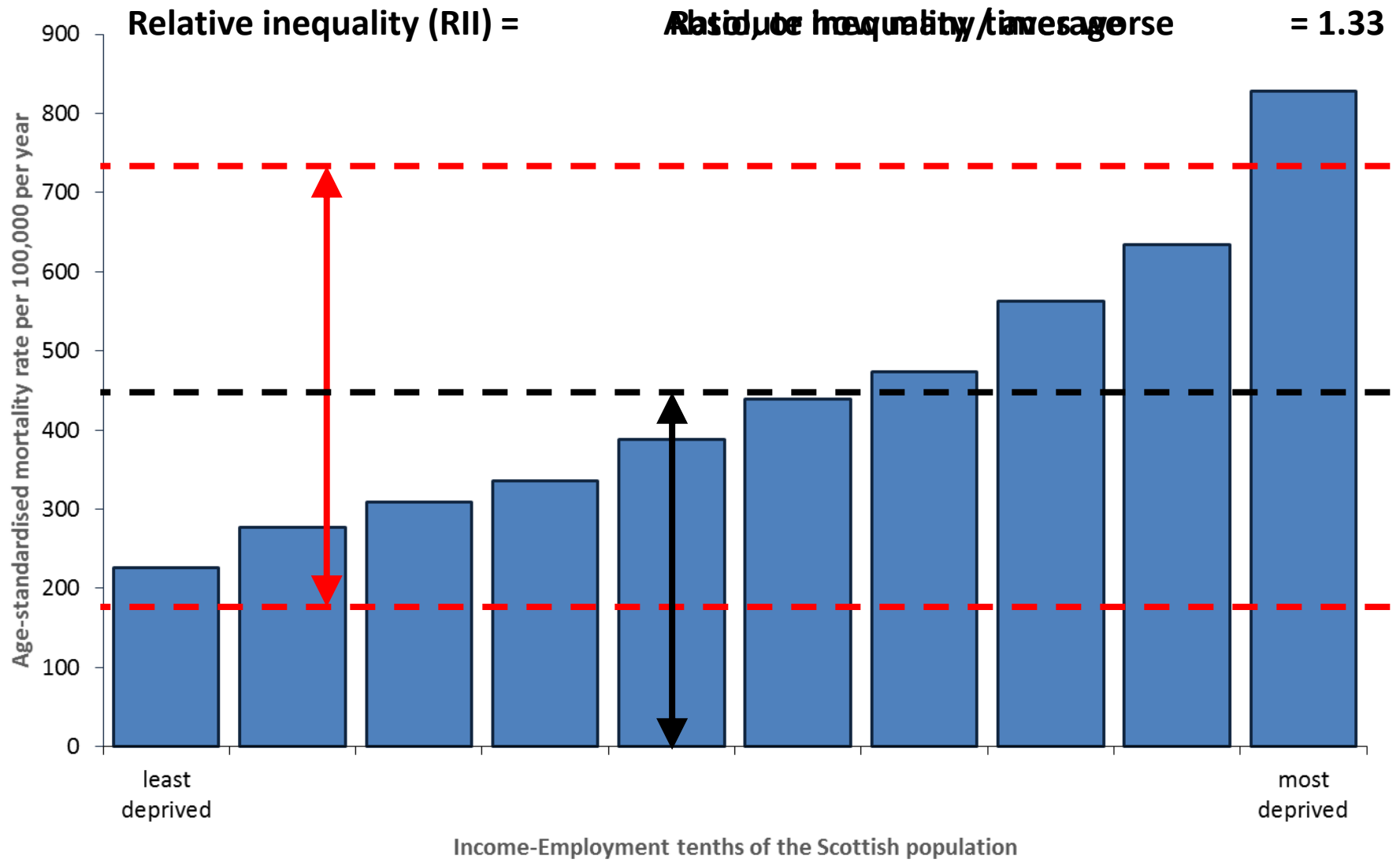


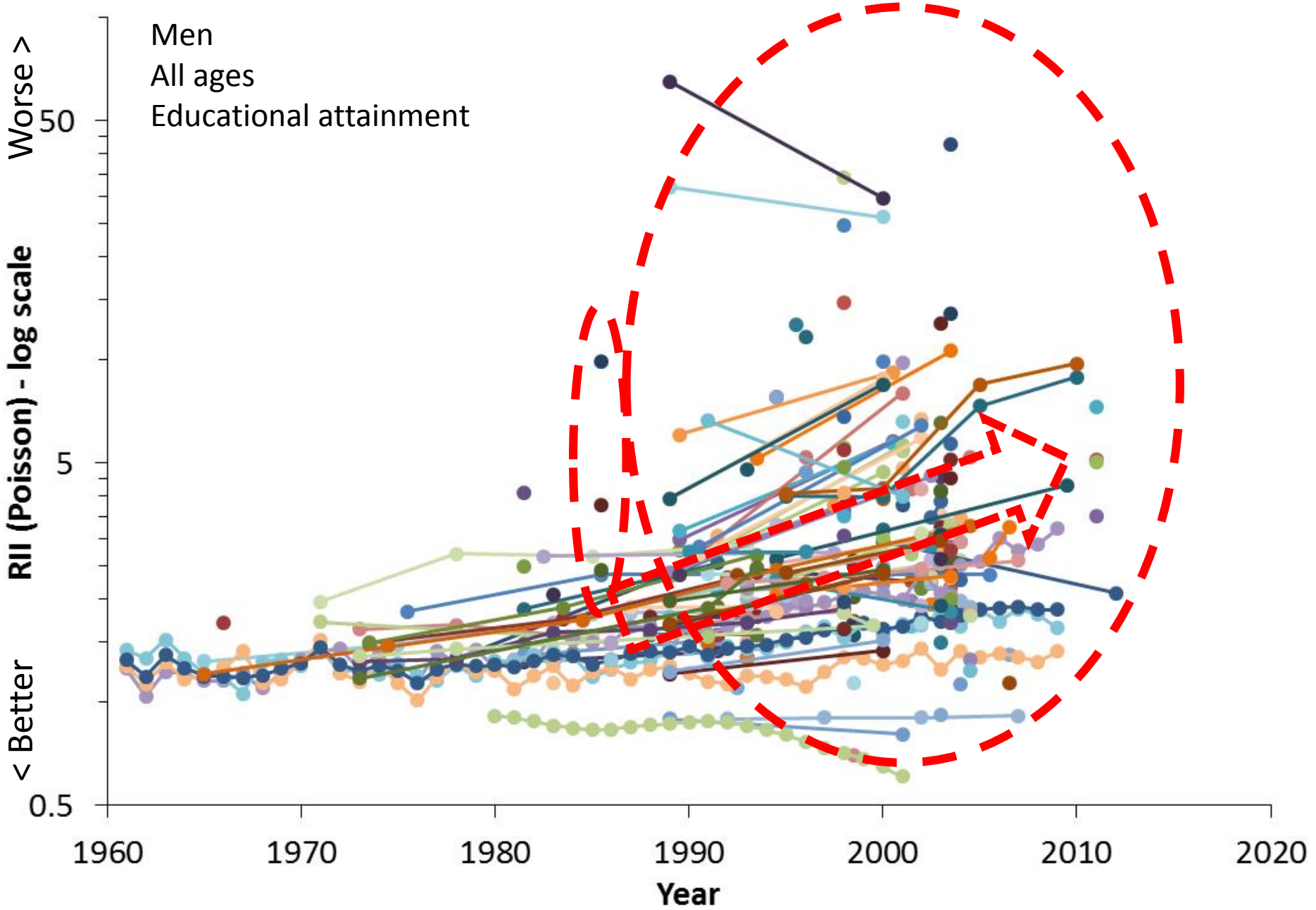
Exposures data

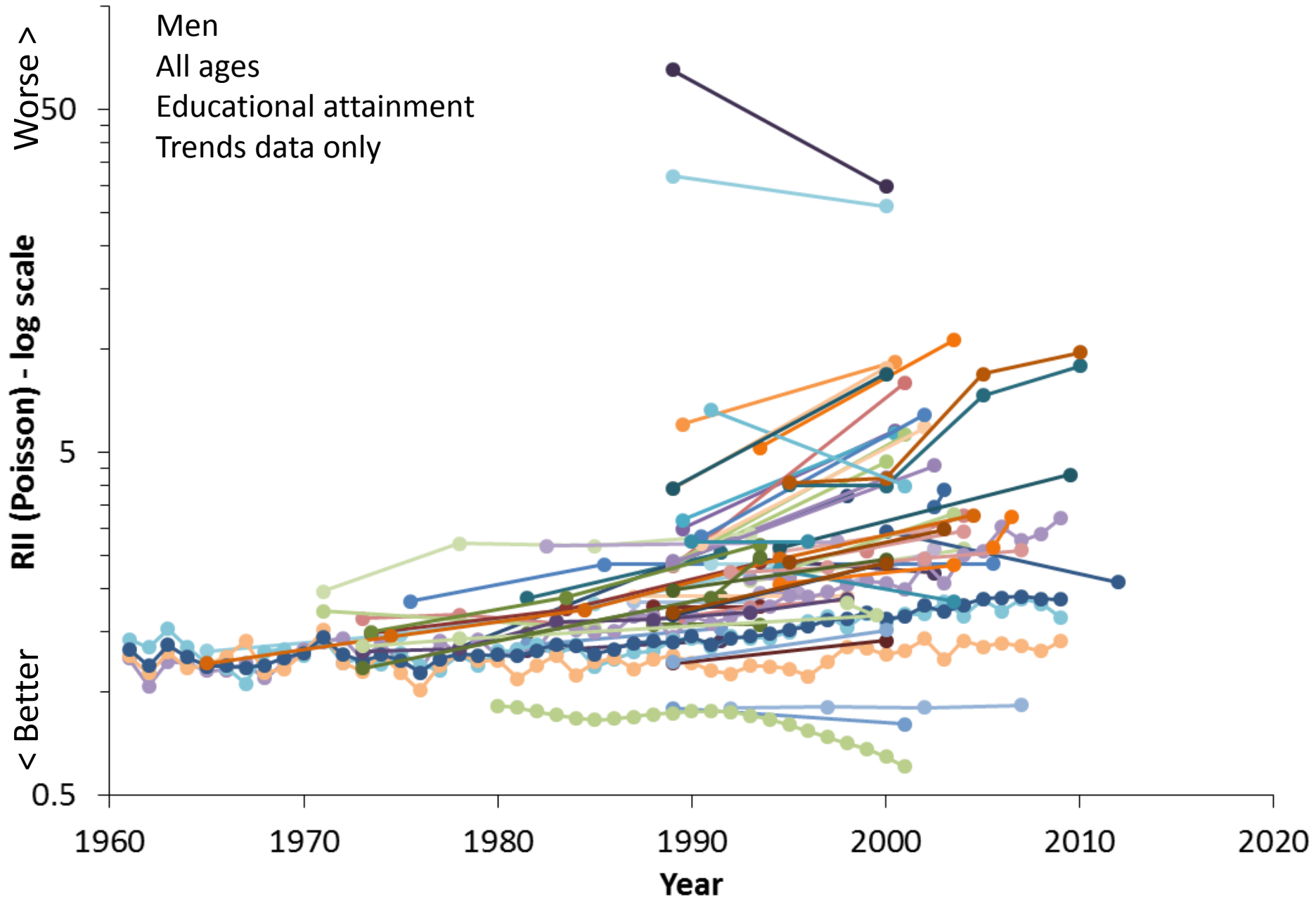
- Policy and Institutions:
  - Comparative Welfare Entitlements Dataset
  - Human Freedoms Index
  - Gender Inequality Index
  - Index of Economic Freedom
  - Democracy
  - Public spending on health and social security
- Economic:
  - Gross Domestic Product (GDP) per capita
  - Income inequality

Results

- >17,000 citations screened
- 247 studies included providing over 3,106 data points
- Many different sets of analyses:
  - Males/ females/ total population
  - Relative/ absolute inequalities
  - Life expectancy/ survival/ mortality
  - Different measures of socio-economic position
  - Different age groups
  - …none of which can be directly compared

Male mortality RII by education


Men
All ages
Educational attainment
Worse >
< Better
RII (Poisson) - log scale
50
5
0.5
1960
1970
1980
1990
2000
2010
2020
Year


Men
All ages
Educational attainment
Trends data only
Worse >
< Better
RII (Poisson) - log scale
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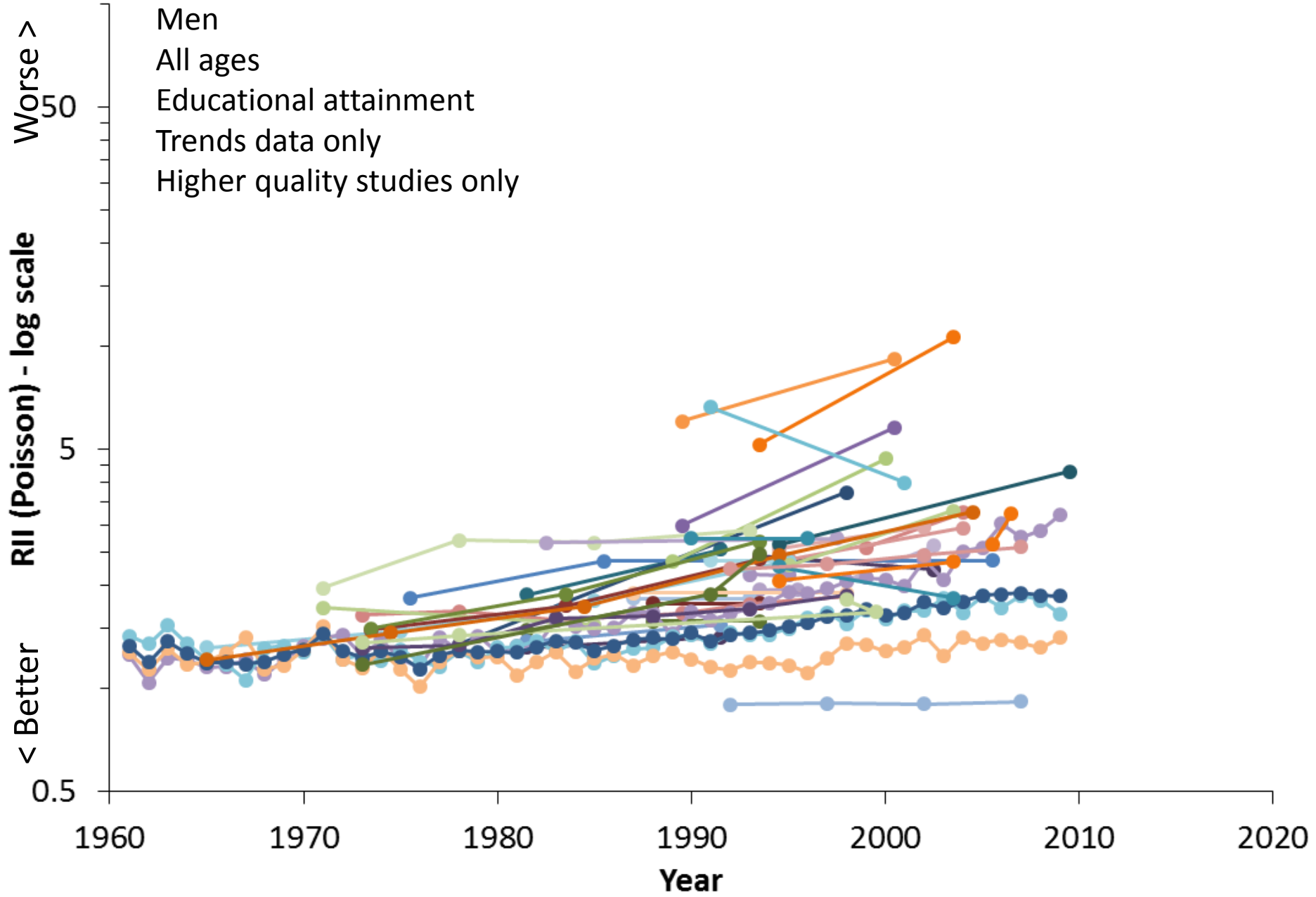
Men
All ages
Educational attainment
Trends data only
Higher quality studies only
Worse >
< Better
RII (Poisson) - log scale
50
5
0.5
1960
1970
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2000
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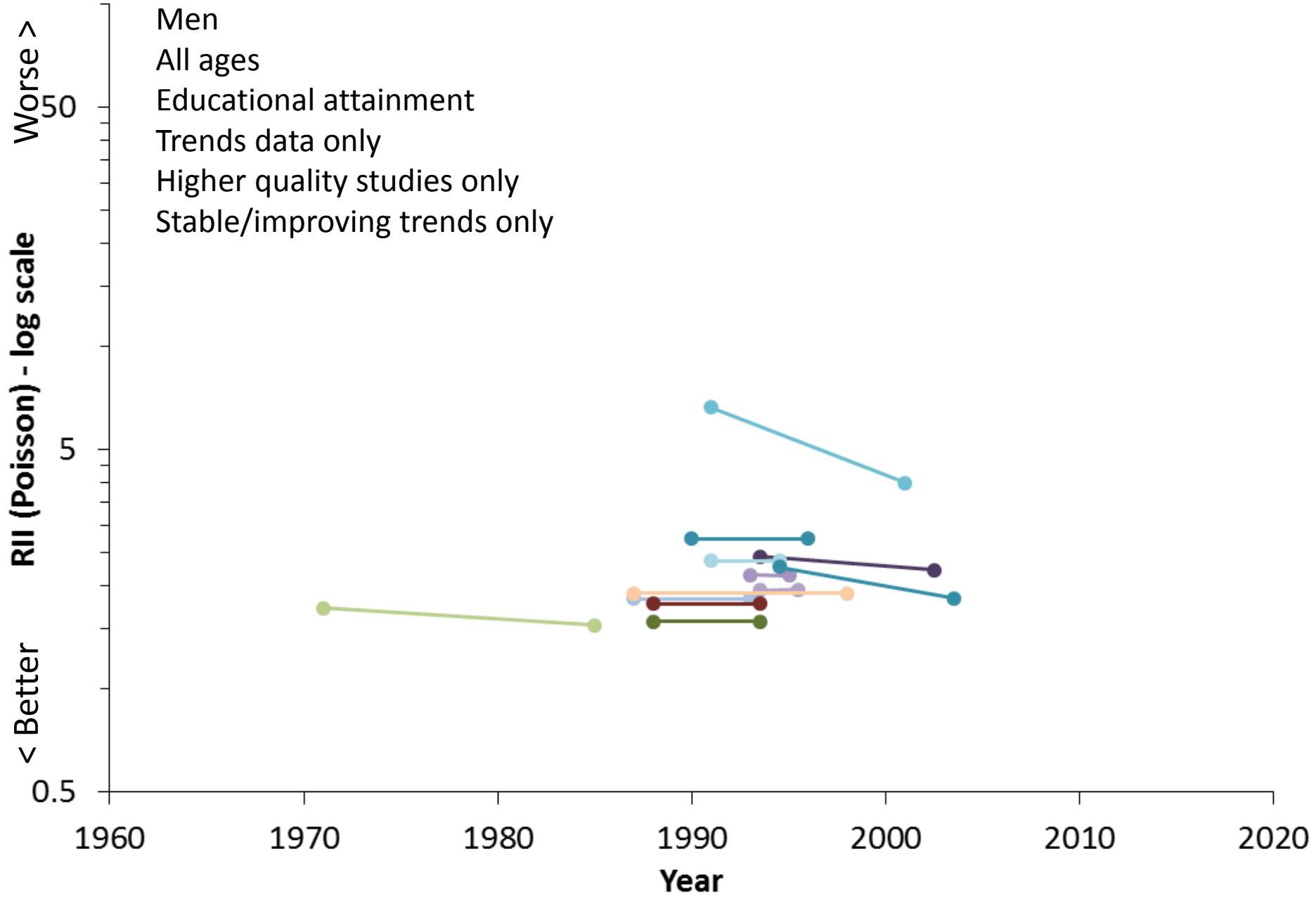
2020
Year


Men
All ages
Educational attainment
Trends data only
Higher quality studies only
Stable/improving trends only
Worse >
50
5
< Better
0.5
RII (Poisson) - log scale
1960
1970
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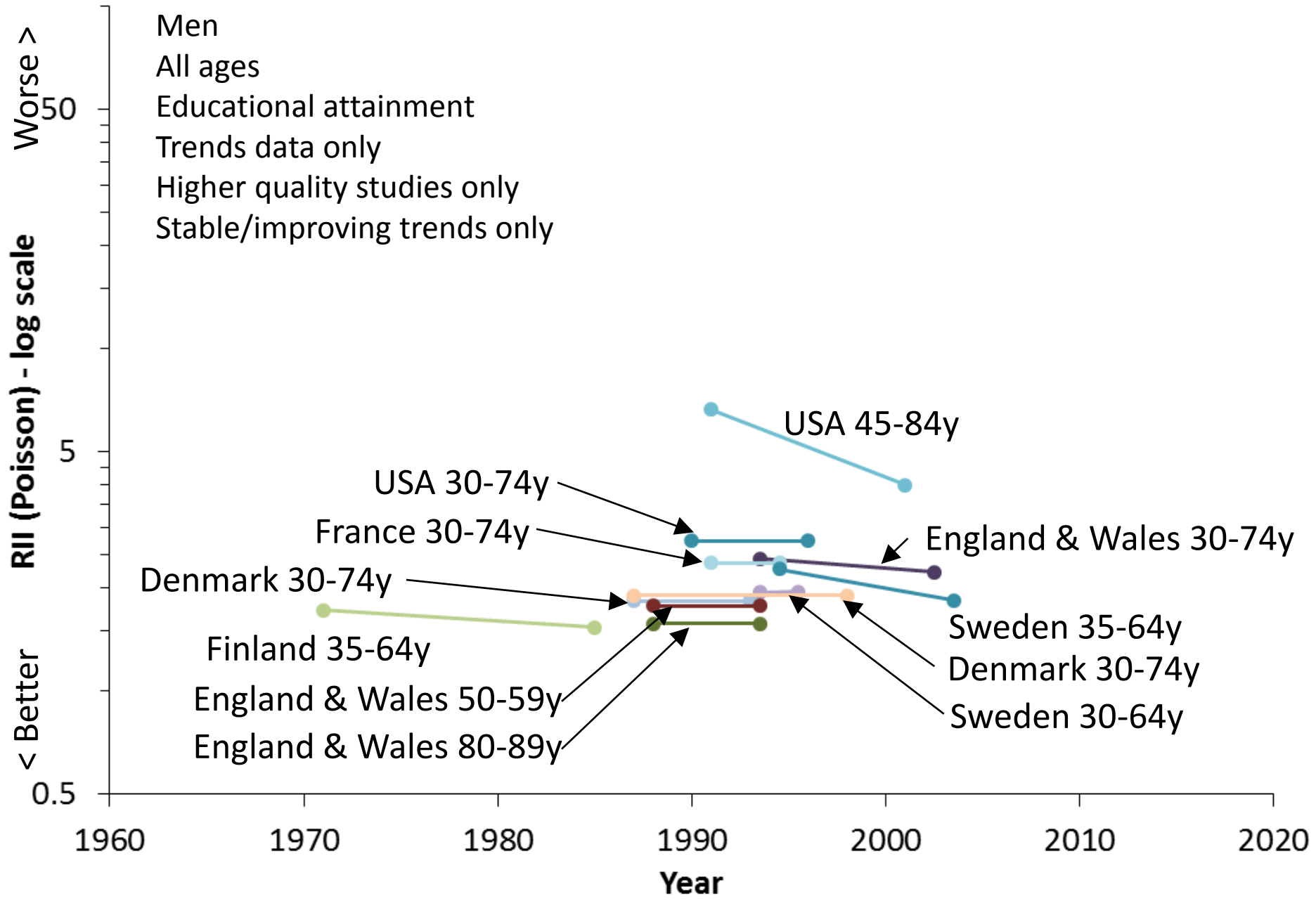
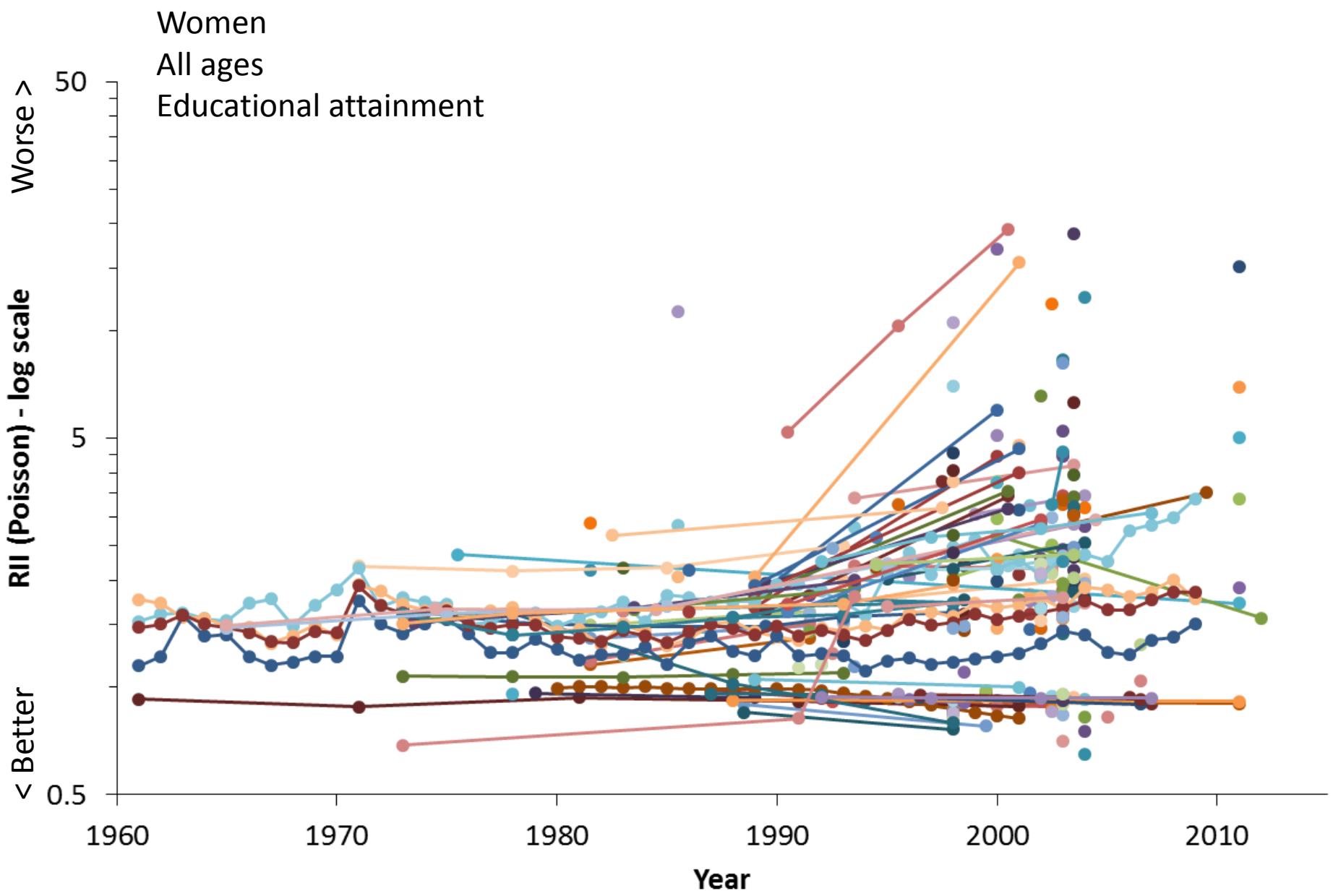
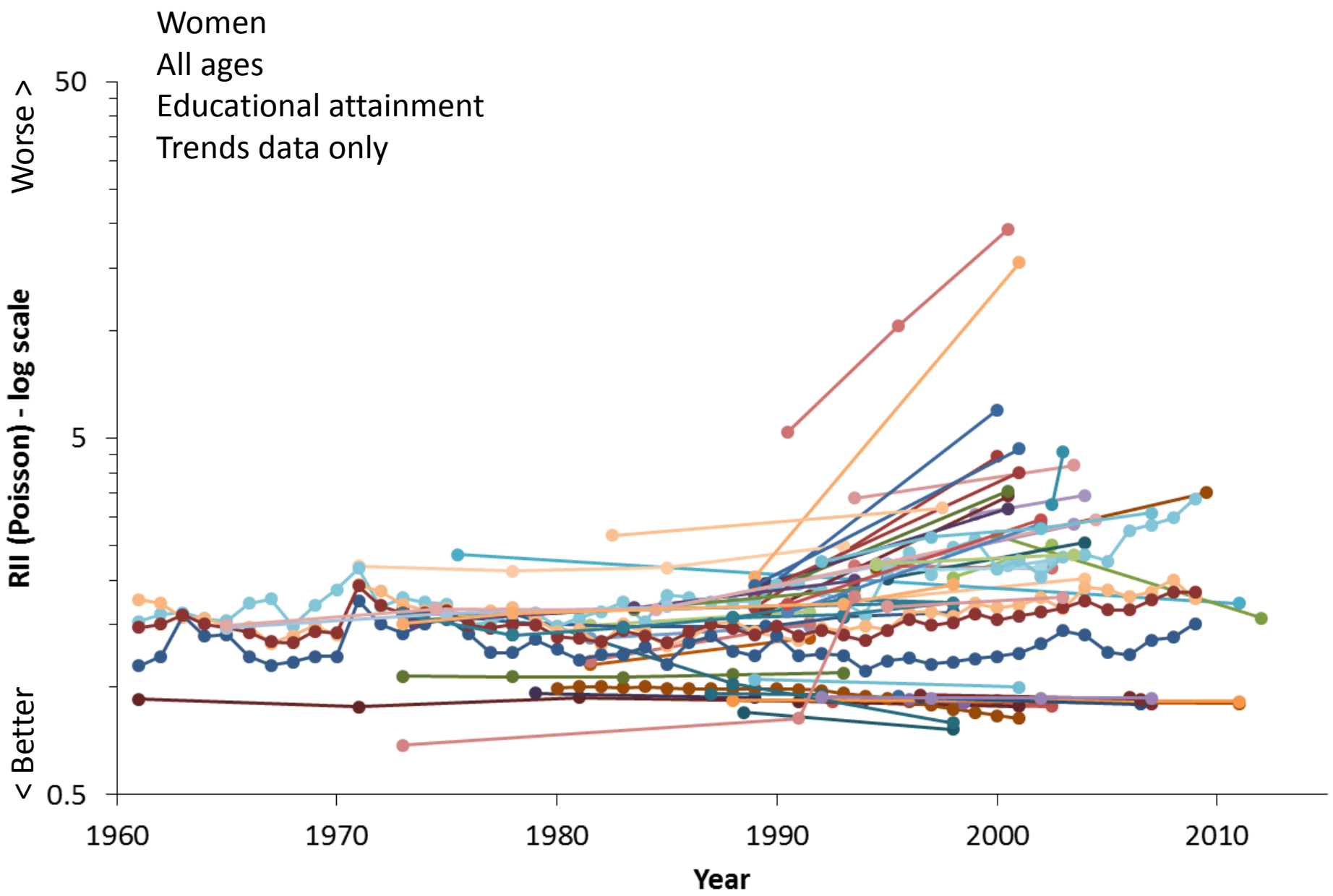
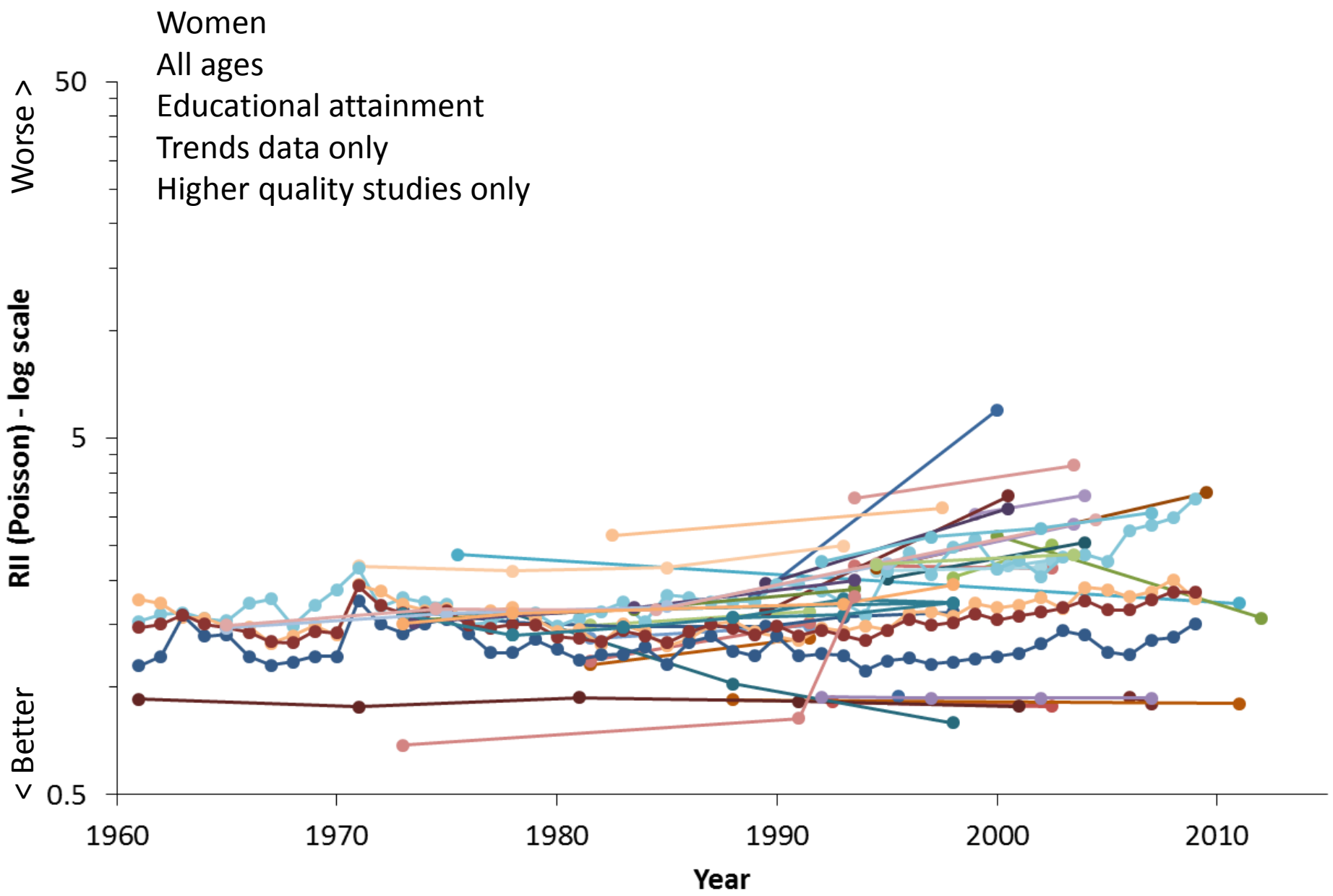
2010
2020
Year


Men
All ages
Educational attainment
Trends data only
Higher quality studies only
Stable/improving trends only
Worse >
< Better
RII (Poisson) - log scale
50
5
0.5
USA 45-84y
USA 30-74y
France 30-74y
Denmark 30-74y
Finland 35-64y
England & Wales 50-59y
England & Wales 80-89y
England & Wales 30-74y
Sweden 35-64y
Denmark 30-74y
Sweden 30-64y
1960
1970
1980
1990
2000
2010
2020
Year

Female mortality RII by education


Women
All ages
Educational attainment
Worse >
< Better
RII (Poisson) - log scale
50
5
0.5
1960
1970
1980
1990
2000
2010
Year


Women
All ages
Educational attainment
Trends data only
Worse >
< Better
RII (Poisson) - log scale
50
5
0.5
1960
1970
1980
1990
2000
2010
Year


Women
All ages
Educational attainment
Trends data only
Higher quality studies only
Worse >
< Better
RII (Poisson) - log scale
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0.5
1960
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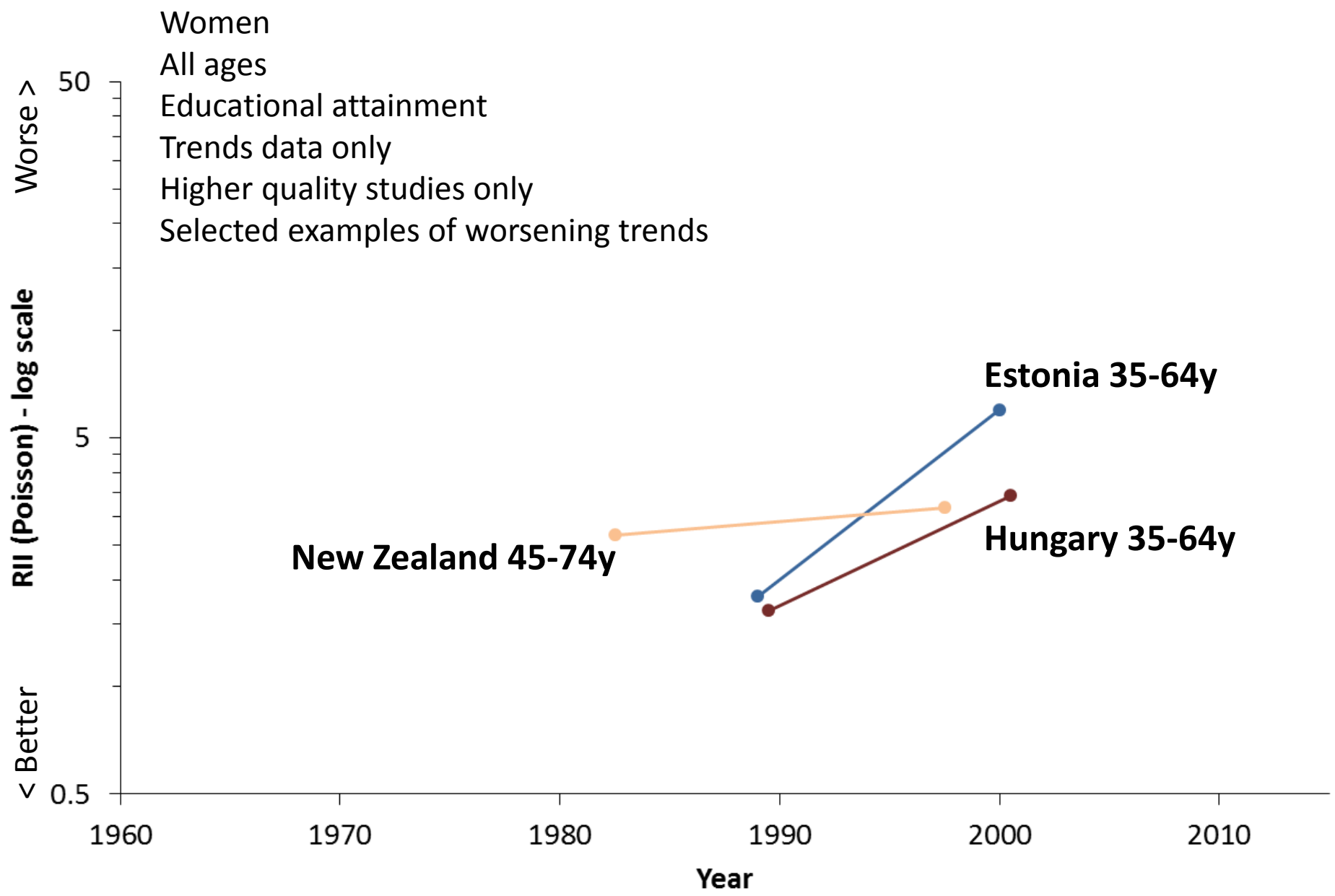
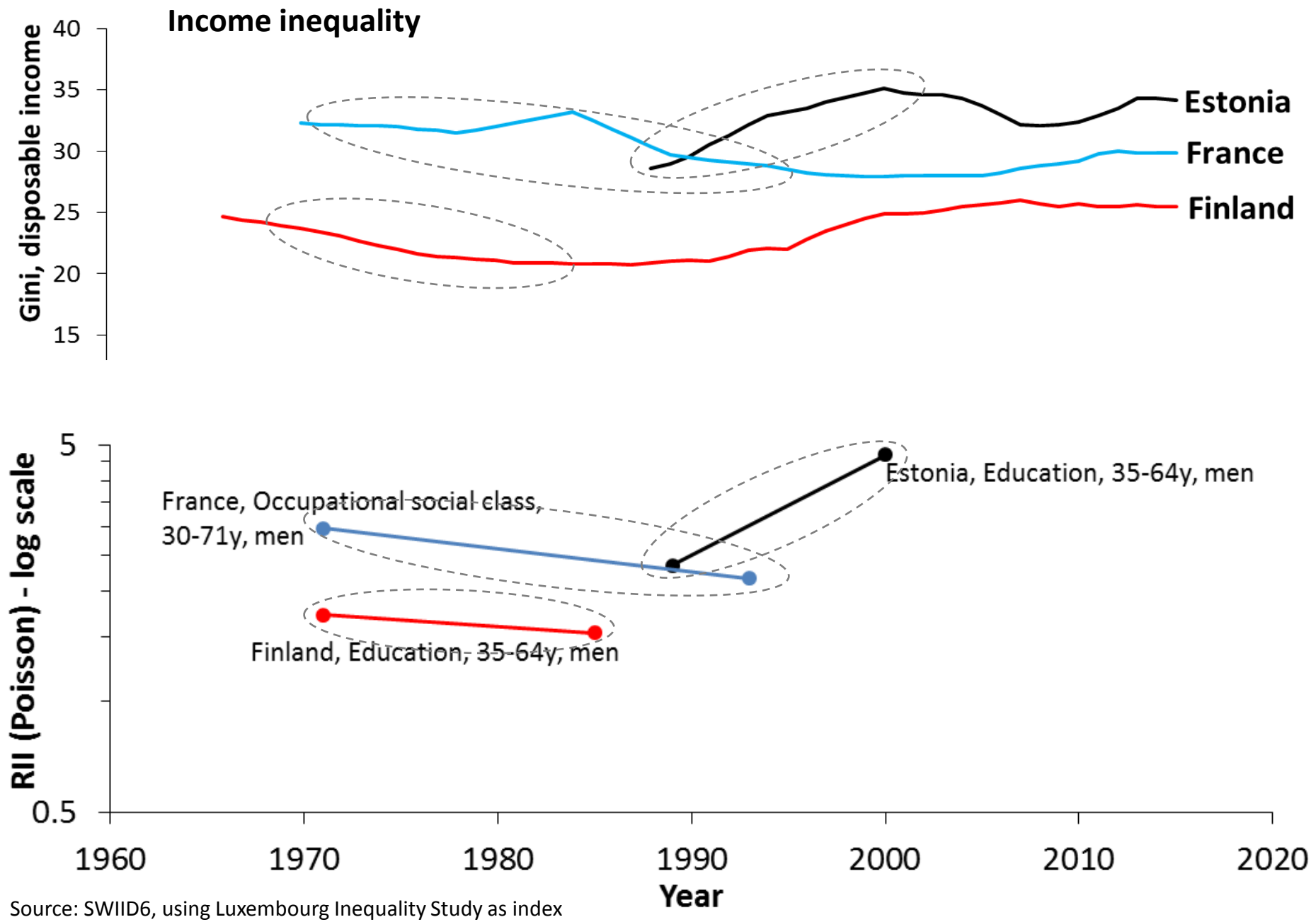
2010
Year

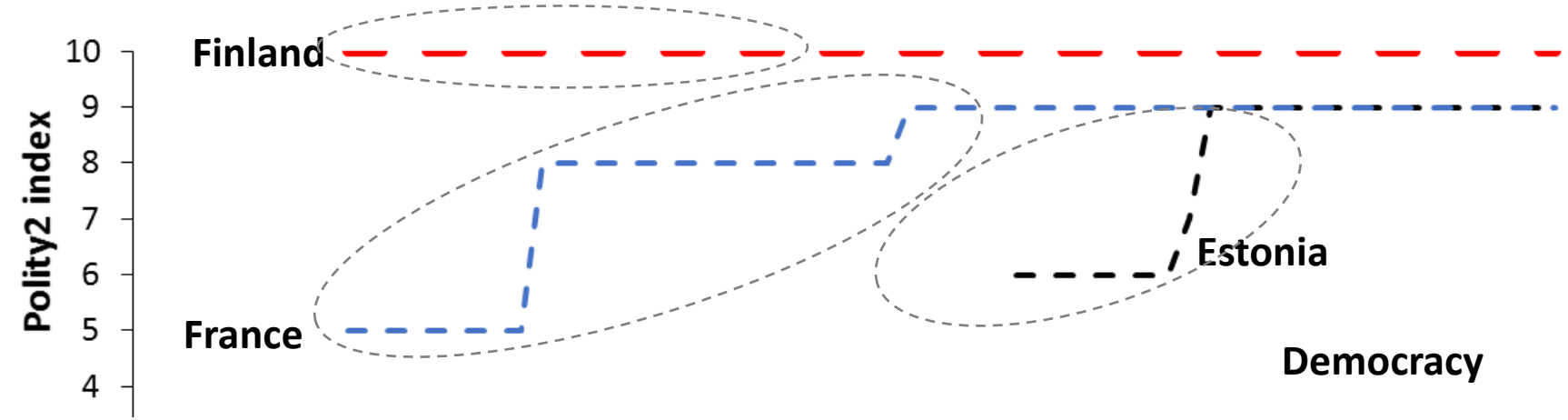

Women
All ages
Educational attainment
Trends data only
Higher quality studies only
Selected examples of worsening trends
Worse >
< Better
RII (Poisson) - log scale
50
5
0.5
1960
1970
1980
1990
2000
2010
Year
Estonia 35-64y
Hungary 35-64y
New Zealand 45-74y

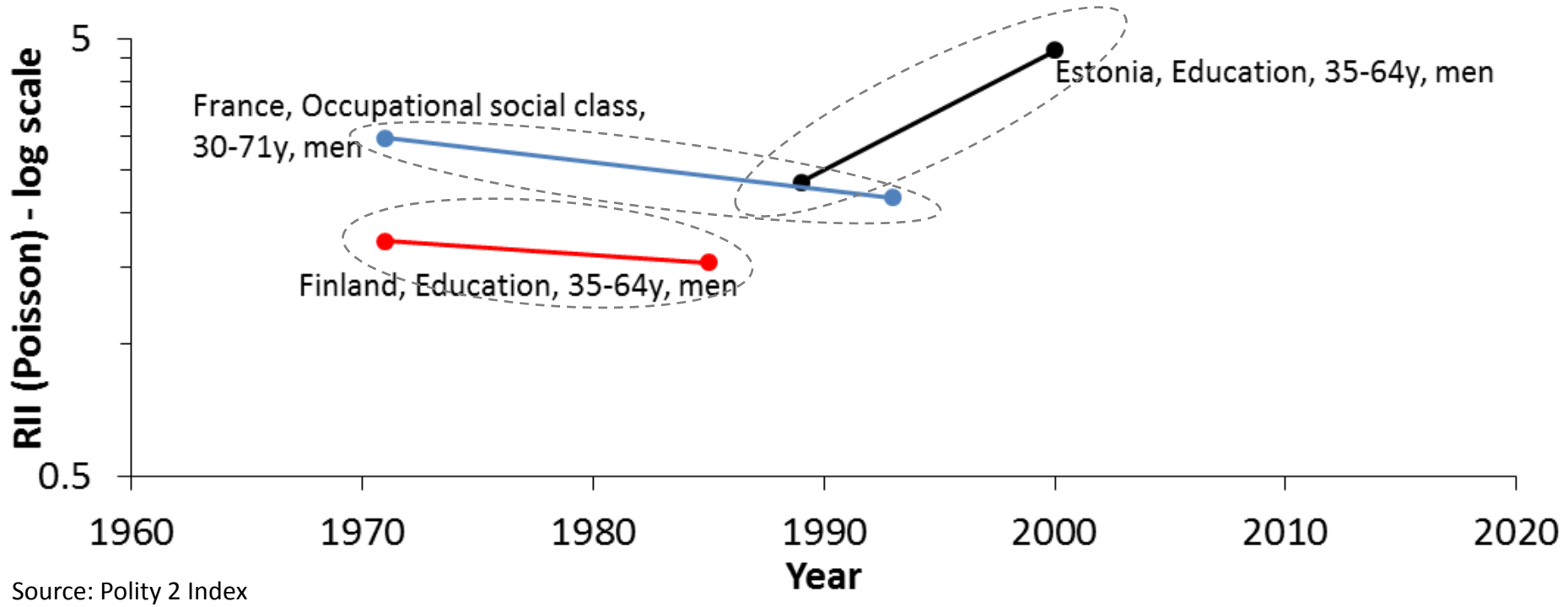
Socioeconomic and political exposures and health inequality trends

- Multilevel modelling will be undertaken…
- …but, the data are very (very) messy
  - Different trends by age group
  - Different trends by socioeconomic position classification used
  - Lots of missing data for exposures too
- Therefore, these case studies are illustrative only
  - Estonia as an example of Eastern Europe
  - Finland and France: long, high quality data series with periods of improvement

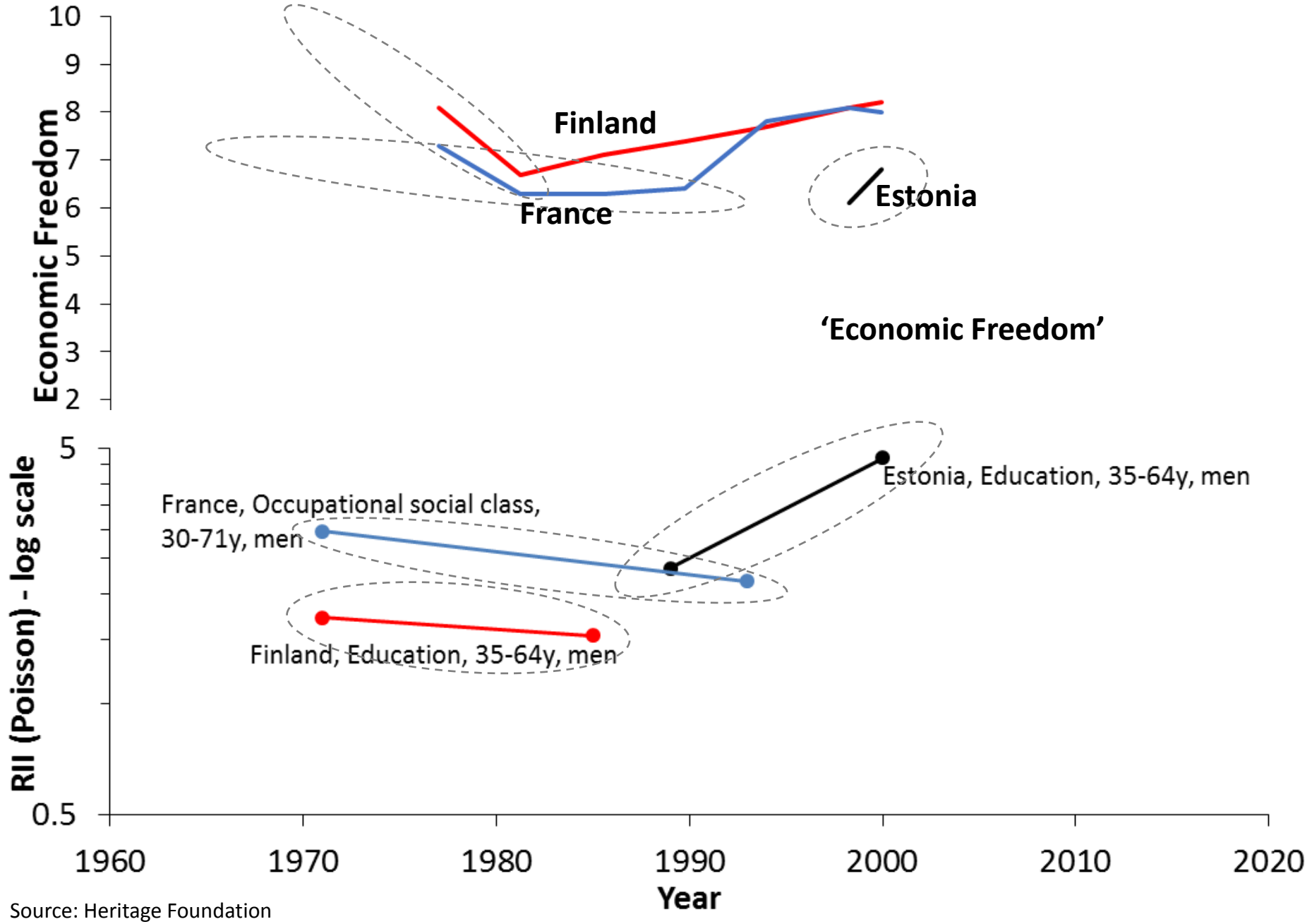


Source: SWIID6, using Luxembourg Inequality Study as index





Source: Polity 2 Index



Source: Heritage Foundation

Summary

- Health inequalities are greatest for young adults and men
- Large increases in many nations health inequalities during 1980s/1990s
- But many nations have seen declines for at least some periods – even in relative terms (contrary to some claims)
- Divergent trends are seen for different measures of socioeconomic position, age groups and for absolute/relative inequalities
- The quality of the data really matters
  - more biased trend data often goes in the opposite direction to better quality data
- Early analysis suggest income equality, democracy and market regulation are important

Next steps

- Multilevel modelling of the exposure-outcome dataset
- Case studies of countries
  - What policy mixes are (in)effective at reducing inequalities?
  - Why do different measures of socioeconomic position diverge?
- Quality checks, publish and make dataset available

Thanks to my co-authors:

Wendy Hearty, S. Vittal Katikireddi, David Walsh, Aaron Reeves, Julie Arnot, Alastair Leyland

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Protocol available at PROSPERO:

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