

Educational inequalities in oral health: a UK-US comparison

Carol Guarnizo-Herreño, Richard Watt,
George Tsakos, Aubrey Sheiham

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Outline

- **Introduction**
- **Objective**
- **Methodology**
- **Results**
- **Discussion**

International comparisons on health inequalities

Help to understand how institutional structures of societies influence health inequalities. Since macro-level determinants are typically homogeneous within a country, international comparisons allow to reveal them

Mackenbach et al., 2008 & Muntaner et al., 2011

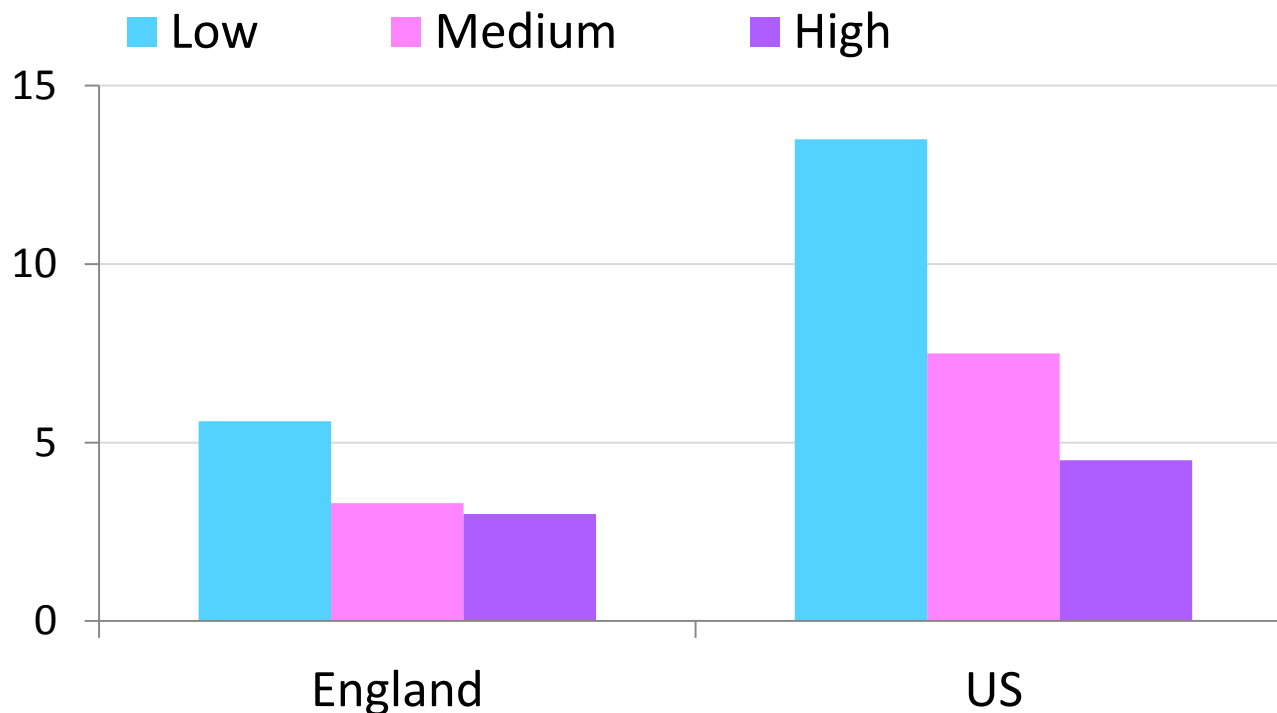
UK - US comparison

- Same welfare state regime (liberal)
- Different health care systems and certain redistributive instruments to reduce poverty and income inequality

UK - US comparisons on health inequalities

Steeper gradients for chronic conditions by income and education in the US compared to England

Banks, Marmot, Oldfield, Smith (2006) JAMA



Prevalence of diabetes, by educational levels, ages 40-70 years

UK - US comparisons on health inequalities

Using a life-course approach, data on 25-51 year-olds showed steeper socioeconomic gradients in health trajectories in the US compared to Britain

McDonough, Worts, Sacker (2010) Soc Sci Med

Among 50-74 year-olds, wealth-based inequalities in chronic diseases and disability were similar in the US and England

Avendano, Glymour, Banks, Mackenbach (2009) AJPH

At all ages (0-80 years), considering different health outcomes, there were similar income gradients in the US and England

Martinson (2012) AJPH

Objective

To compare oral health inequalities between the United States and the United Kingdom.

Methods

Data Sources

UK: Adult Dental Health Survey, ADHS 2009

- Aimed to provide information on adults' oral health
- Two-stage, cluster sampling design which provides a representative sample of persons aged ≥ 16 years
- Information from a questionnaire based interview and a clinical examination (among dentate)



Interview
11,380

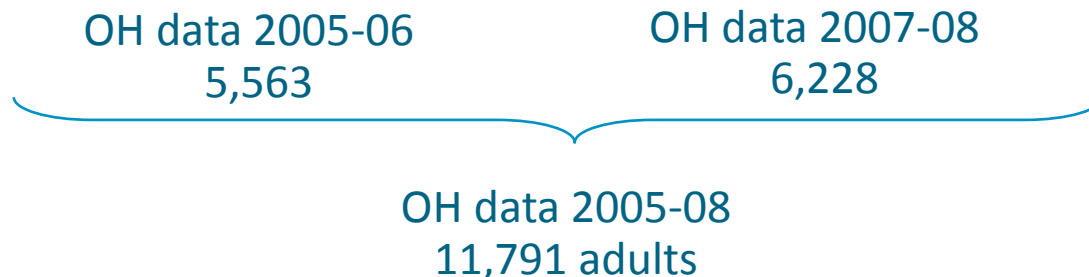
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Clinical exam
6,469

Data Sources

US: National Health and Nutrition Examination Survey, NHANES 2005-2008

- Multi-stage, cluster sampling design → nationally representative sample
- Continuous annual survey with data released on two-year cycles
- Periods 2005-06 and 2007-08 were used in this study as they include comparable oral health information for adults aged 18 years and over
- OH component includes data from interview and clinical examination



Analytic Samples

Participants aged ≥ 25 years

- Chances of having reached highest educational attainment
- In the US people finish university at older average age than in the UK

Complete-case analyses

- Excluded if missing data on oral health, education or any covariates
- Missing data less than 1%

UK	
Subjective	10,268
Clinical	5,800

US	
Subjective	9,786
Clinical	7,718

Variables - Oral health outcomes

Clinical measures (among dentate participants)

One or more decayed teeth

Having 20 or less natural teeth

Subjective measures	UK	US
Self-rated oral health (less than good)	Very good, good vs. fair, bad, very bad	Excellent, very good, good vs. fair, poor
Reporting ≥ 1 oral impact Having one or more responses of 'very often' or 'fairly often' to any of the questions	Identical questions based on some items from OHIP-14: <ul style="list-style-type: none"> Painful aching in mouth Felt life less satisfying Difficulty doing usual jobs Affected sense of taste Felt uncomfortable eating any food Being self-conscious or embarrassed 	

SEP measure

Educational attainment	UK	US
High	College degree or above	College degree or above
Medium	Some qualifications but not college degree	High school diploma
Low	No qualifications	Less than high school

Covariates

- Age
- Gender
- Marital status
- Ethnicity (White vs. Non-white)

Statistical analysis

1. **Age-standardized prevalence** of oral health outcomes in each country. Prevalence was weighted and age-standardized by the direct method, using the OECD 2009 standard population.

2. **Prevalence Ratios** – Robust Poisson regression models
 - Oral health measure (as dependent variable)
 - Educational level (as categorical explanatory variable)
 - Adjusting for covariates

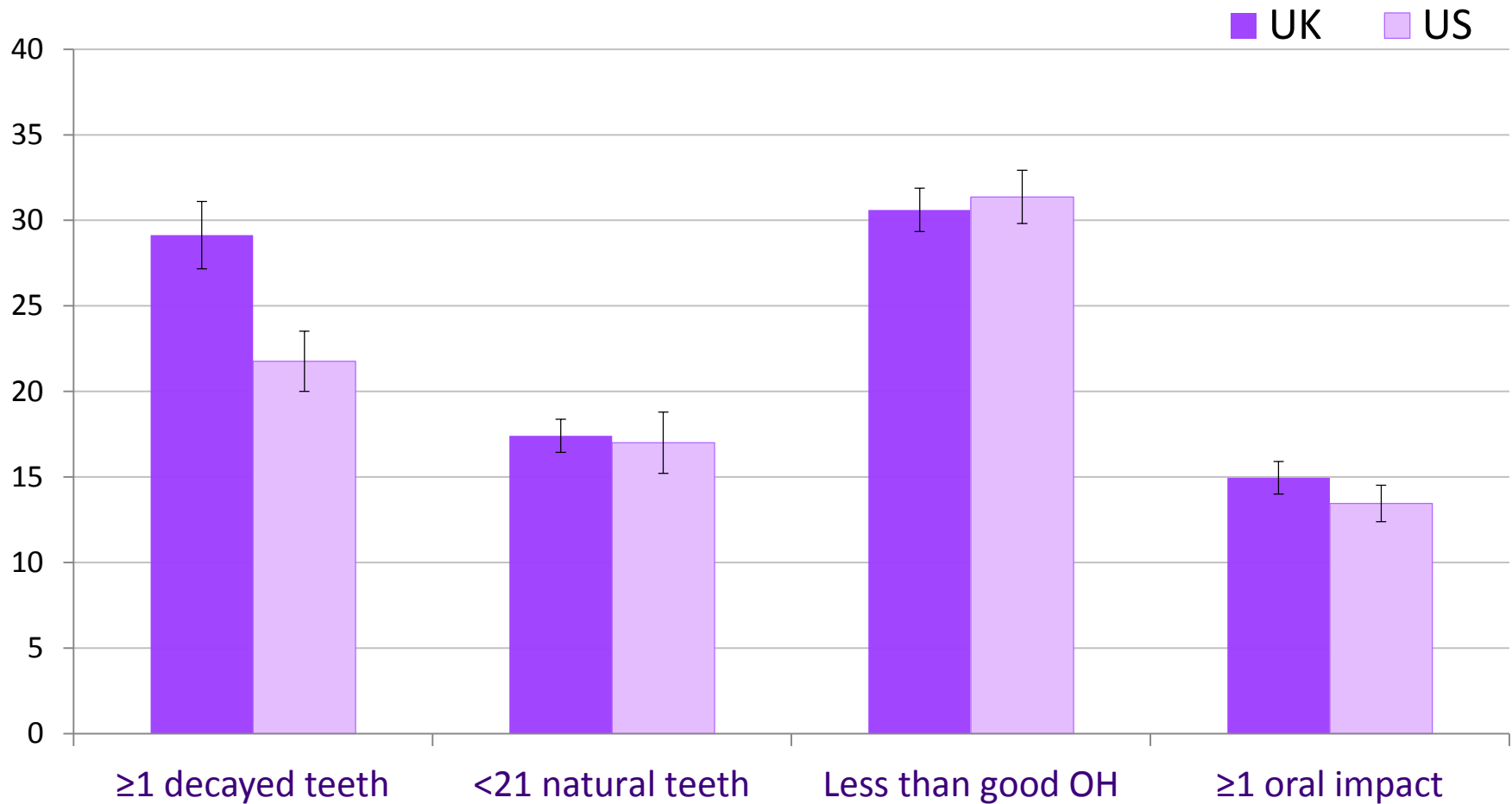
3. **Relative Index of Inequality (RII) and Slope Index of Inequality (SII)**

- Regression-based indices which take into account the distribution of the population across all socioeconomic categories
- RII = prevalence ratio
RII > 1: outcome is higher among those in lower educational level
- SII = difference in prevalence
SII > 0: outcome increases with lower levels of education
- Poisson regression model (RII), weighted linear model (SII)

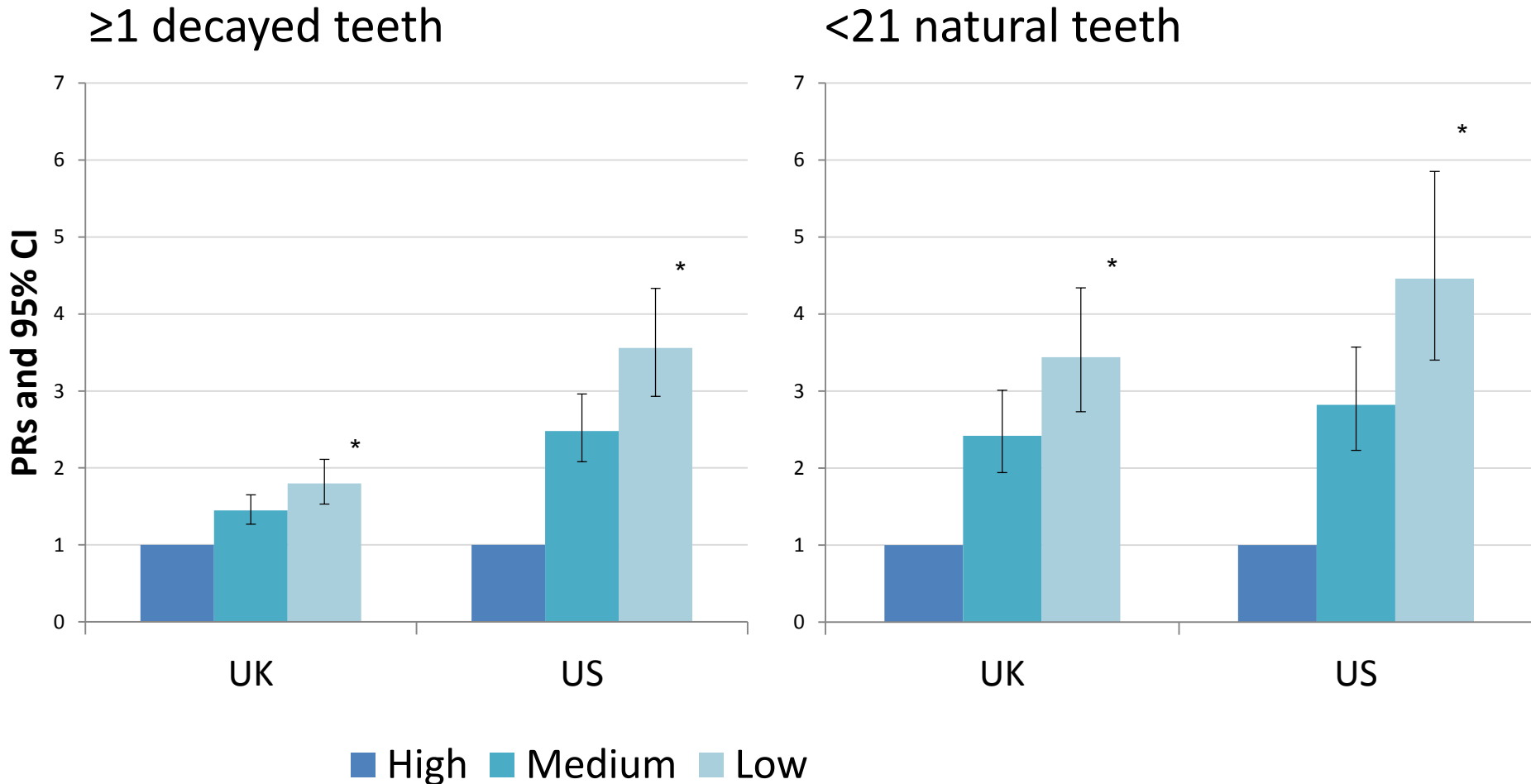
All analyses took into account survey design and used the survey sampling probability weights to obtain population-based estimates

Results

Age-standardized prevalence of oral outcomes, UK and US



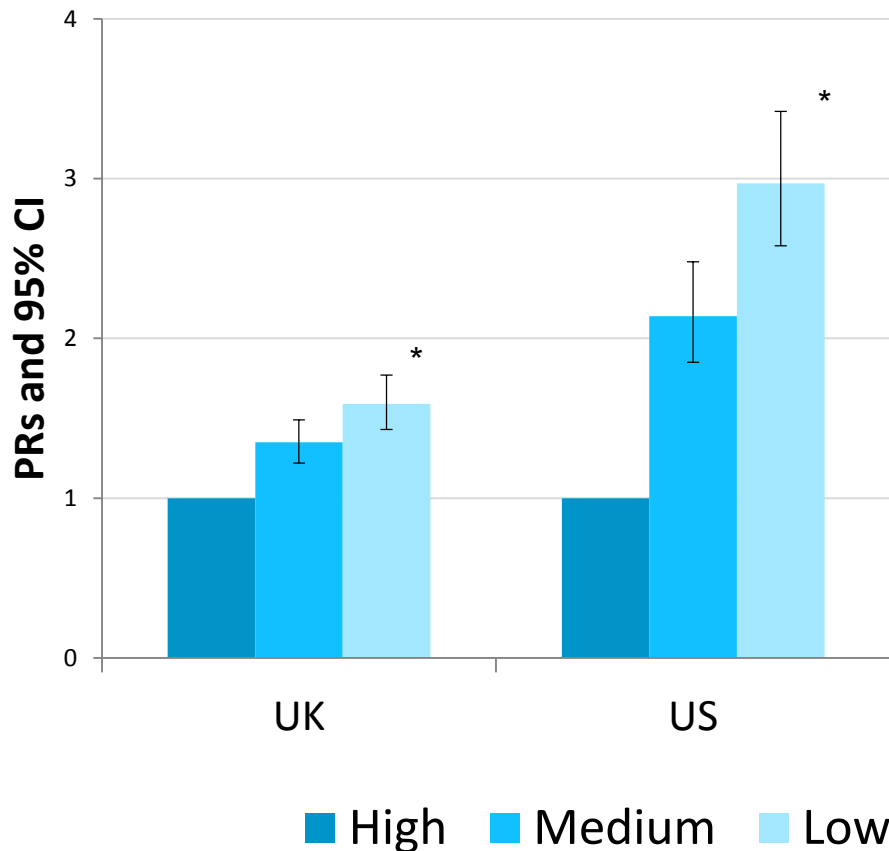
Associations between educational level and oral health, UK and US



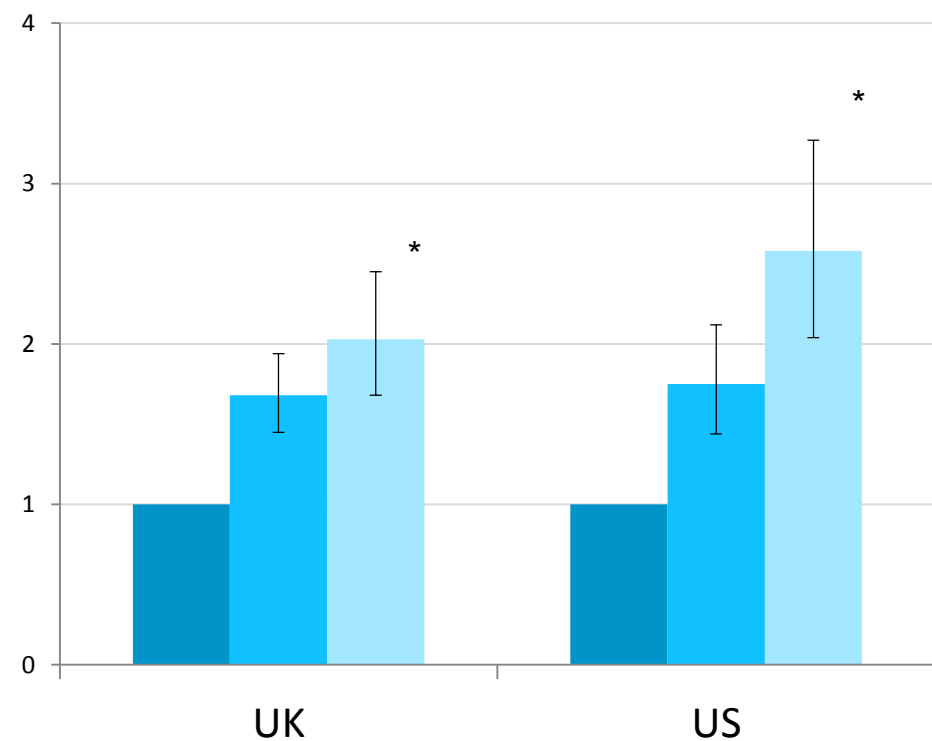
* P for trend ≤ 0.01

Associations between educational level and oral health, UK and US

Less than good OH

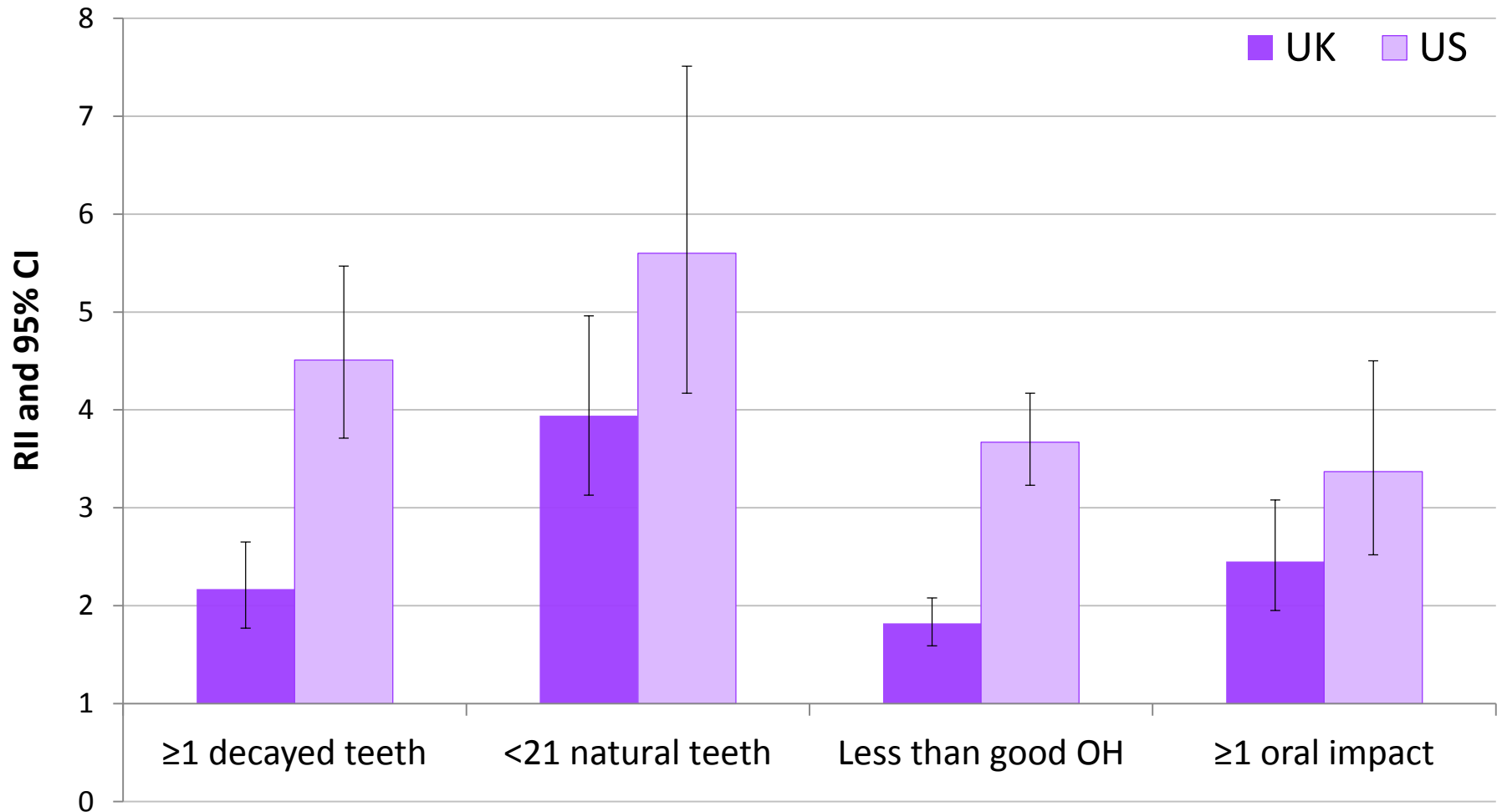


Reporting ≥1 oral impact

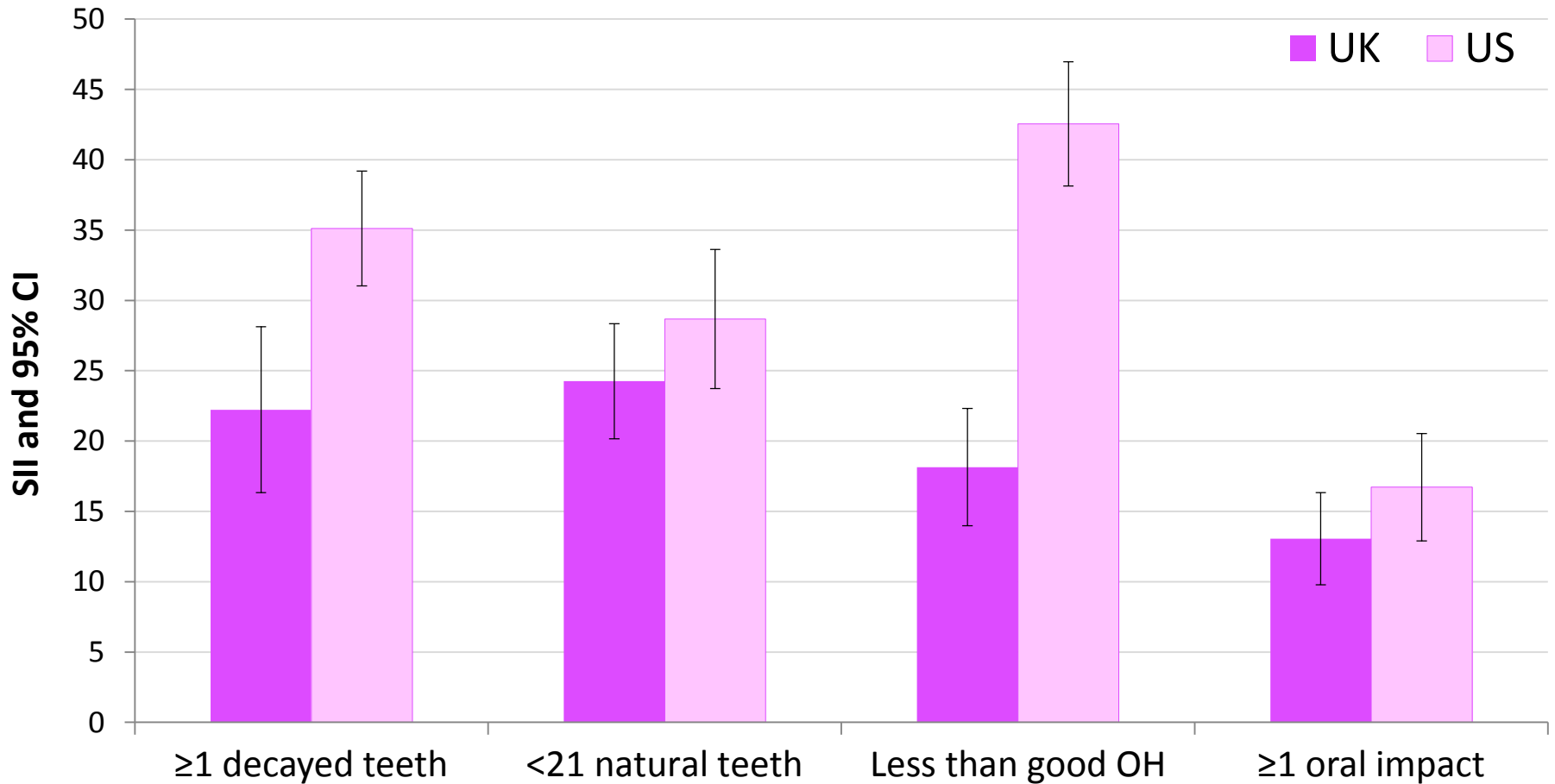


* *P* for trend ≤ 0.01

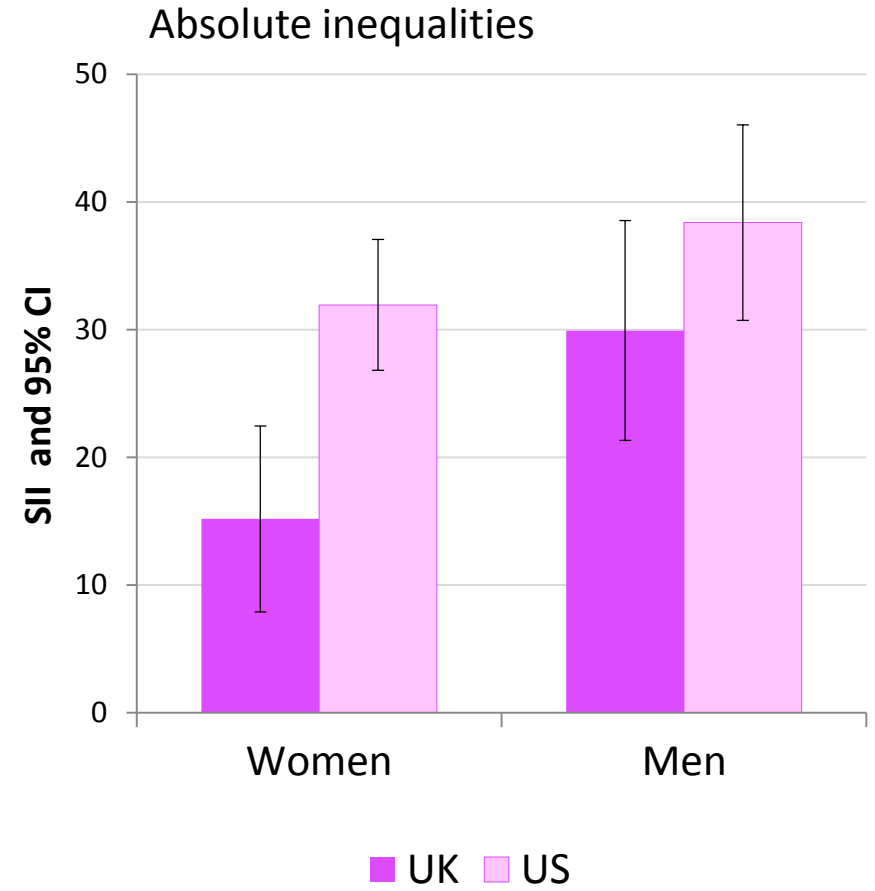
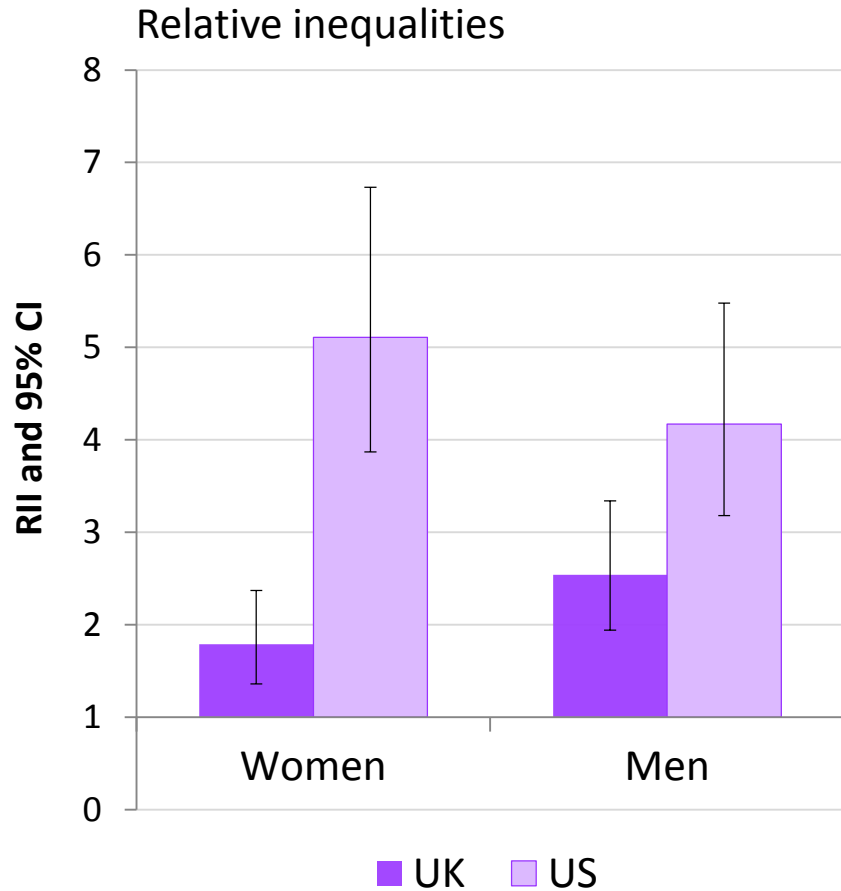
Relative educational inequalities (RII) in oral health outcomes, UK and US



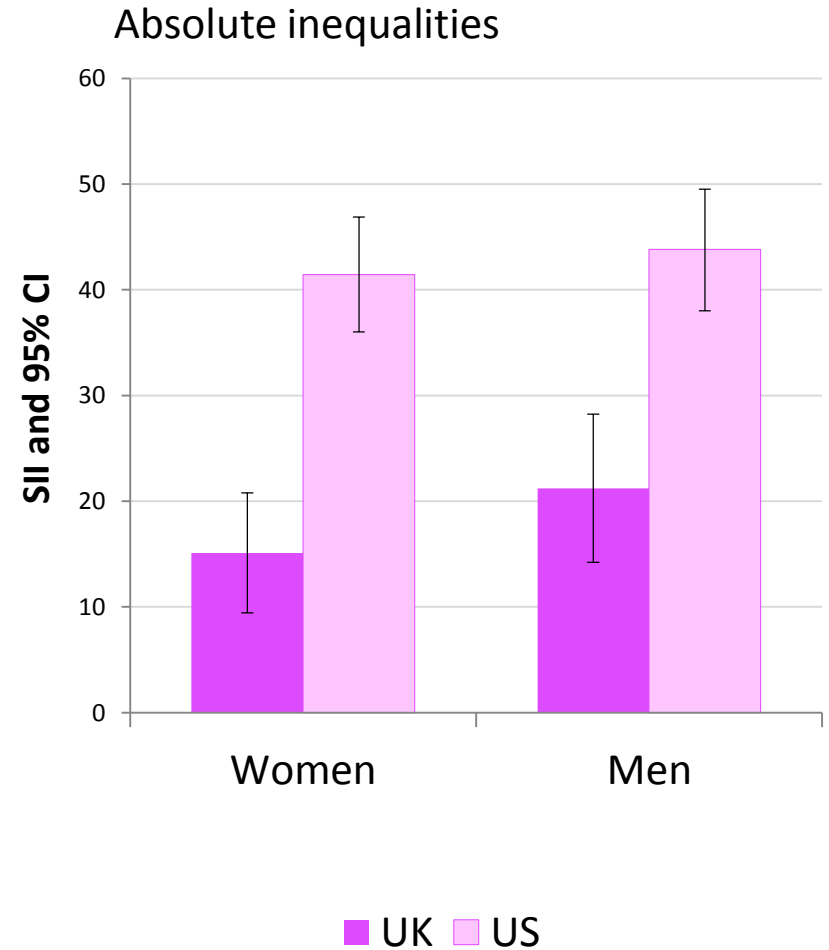
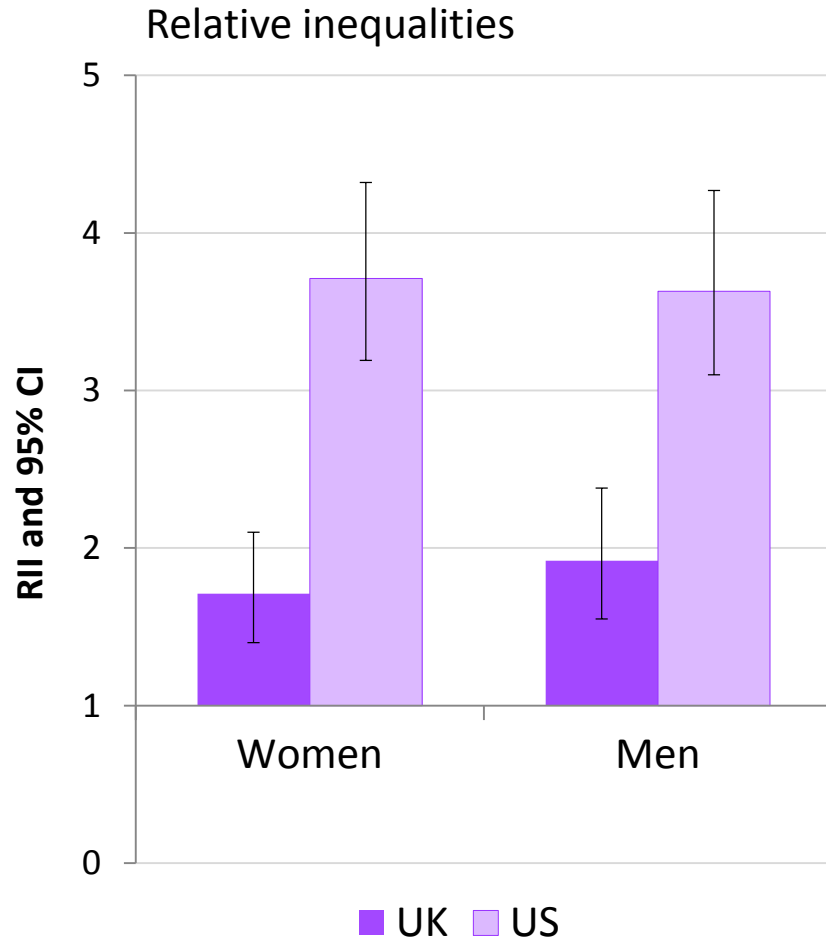
Absolute educational inequalities (SII) in oral health outcomes, UK and US



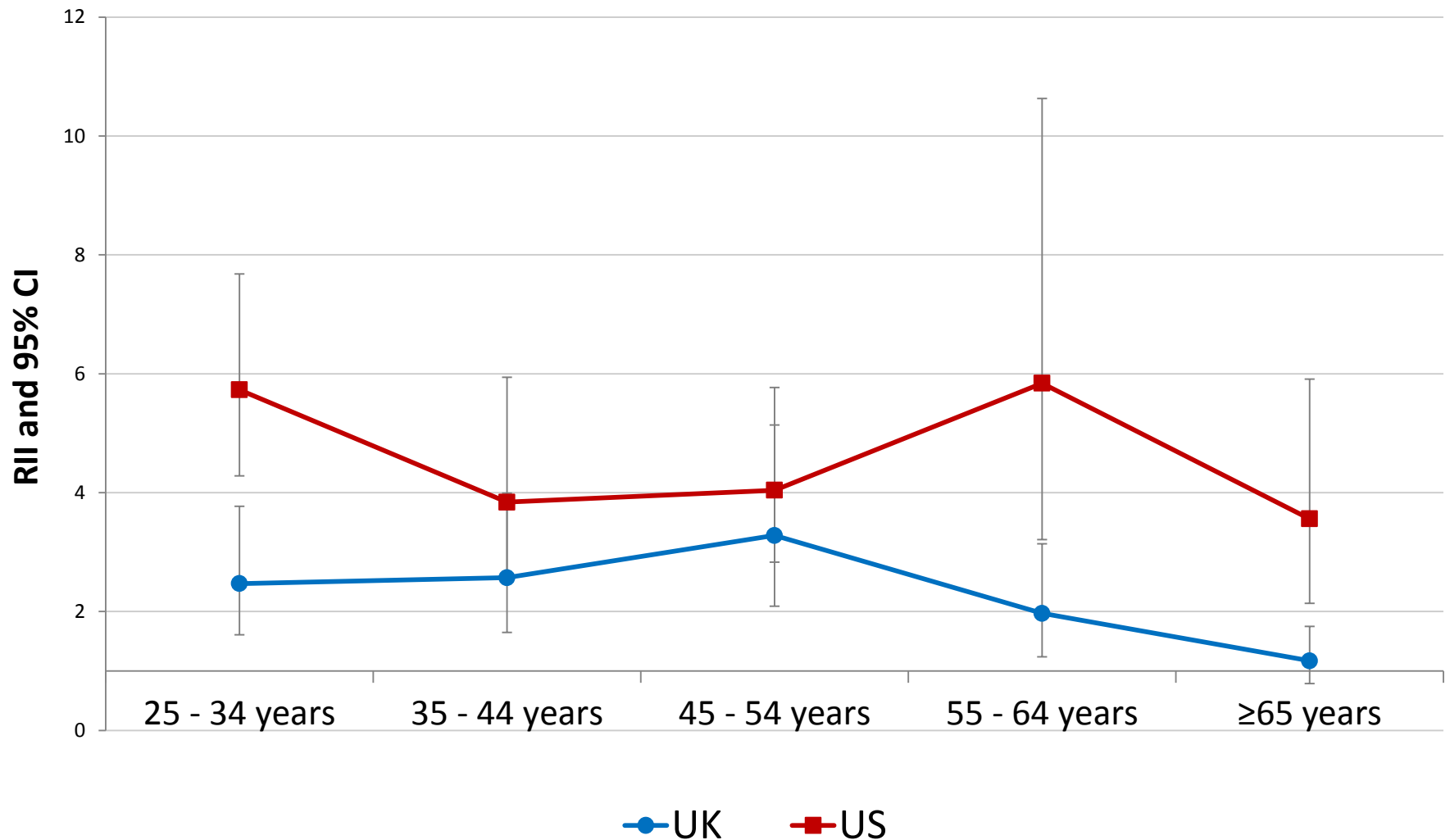
Educational inequalities in ≥ 1 decayed teeth by gender, UK and US



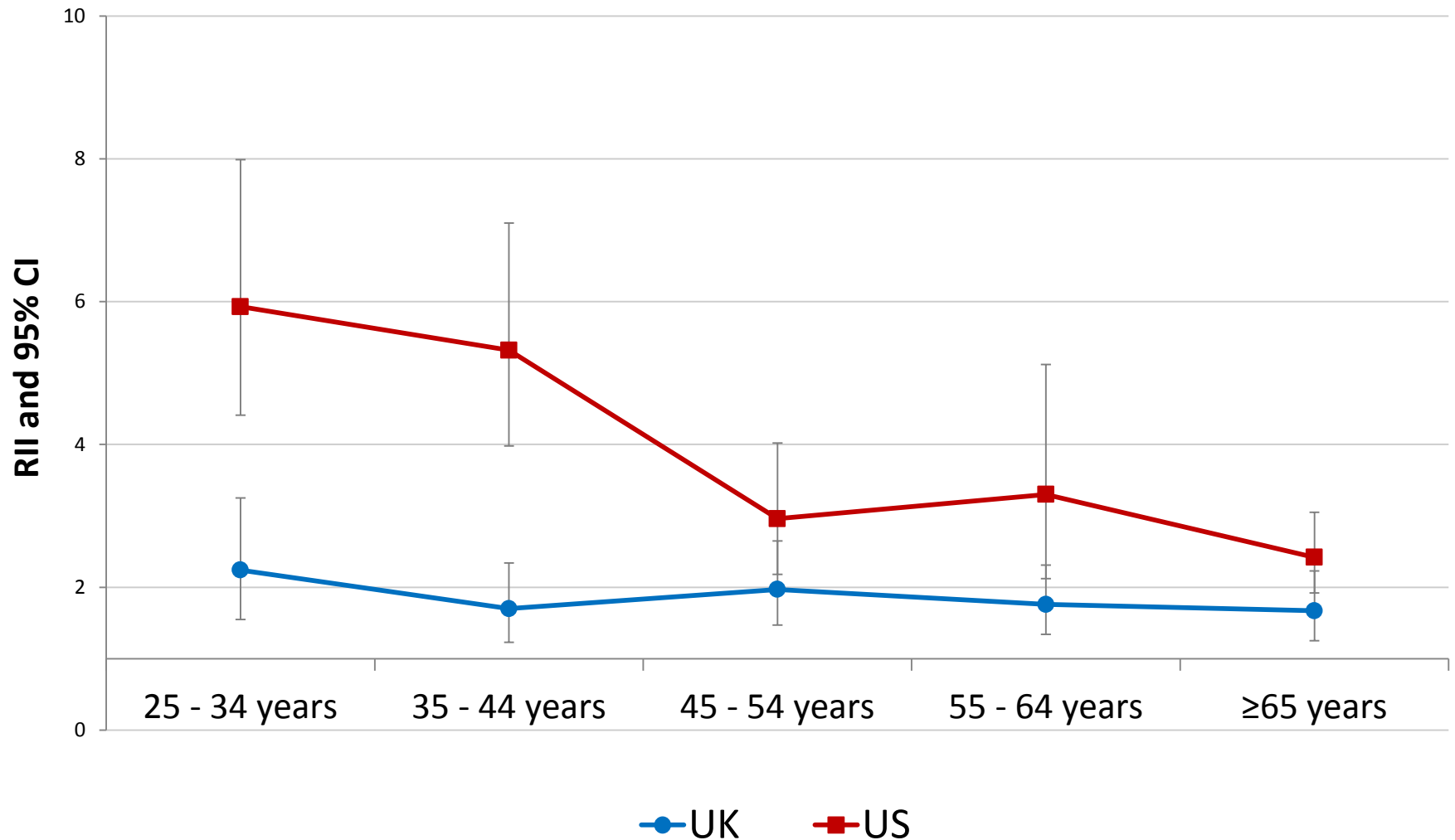
Educational inequalities in self-rated OH by gender, UK and US



Relative educational inequalities in ≥1 decayed teeth by age groups, UK and US



Relative educational inequalities in self-rated OH by age groups, UK and US



Summary

- General pattern of educational gradients in both countries
- Consistent larger inequalities in the US (relative and absolute)
- Greater UK-US differences in the magnitude of inequalities for the outcomes of ≥ 1 decayed teeth and self-rated oral health. These differences tended to be larger among women and young people.
- Additionally, we conducted sensitivity analyses restricting the sample to White population, and the results were not sensitive to this specification.

Discussion

Limitations

- Comparability of subjective measures in different countries
- No data available on Scotland in the ADHS 2009
- OH data from NHANES 2009-10 not suitable for analysis

Strengths

- First study on a UK-US comparison on OH inequalities
- Comparison of two nationally representative samples with both clinical and subjective measures of oral health. These outcomes represent different dimensions of oral health

Discussion

- Results on magnitude of inequalities support the potential role of the health care system, and other social protection policies
- Larger differences among young people
 - Difficult to disentangle age and cohort effect
 - Education more relevant as SEP marker at young age
 - Long term larger differences among this cohort

Discussion

- Differences in ethnic composition did not explain larger inequalities in the US as we found consistent results when analysing White population only
- Further research should explore the potential contribution of material, psychosocial and behavioural factors in explaining inequalities in oral health in the two countries

Thank you!