



# **DATA QUALITY IN CROSS-NATIONAL SURVEY**

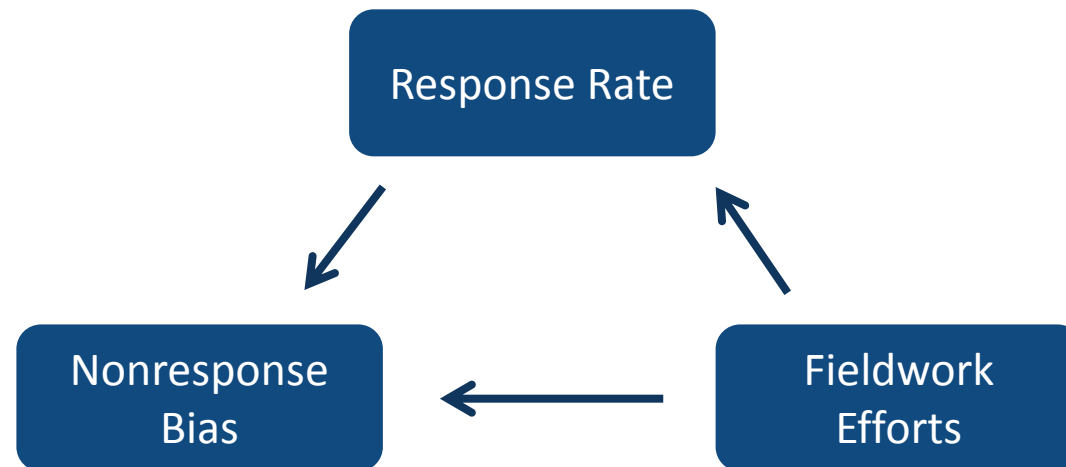
**THE QUALITY INDICATORS  
RESPONSE RATE, NONRESPONSE BIAS  
AND FIELDWORK EFFORTS**

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## **ESRC Research Methods Festival**


6th July 2016  
Bath, United Kingdom

- Why do we think that Response Rate is „the“ quality indicator?
- Objective: Empirically test implicit assumptions



# Content

Analysis: Indicators of data quality

- Part A- Development of Response Rates
  - Part B- Response Rate and Nonresponse Bias
  - Part C- Response Rate and Fieldwork Effort
  - Part D- Nonresponse Bias and Fieldwork Effort
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# A-Development of Response Rate (RR)

- Why is the development of RR interesting?

RR as central indicator of survey quality

- What's new?

Previous research focus on

- the US,
- only one country
- older data.
- Include different surveys (different topics and set-ups).
- Response rate calculation is not always comparable.

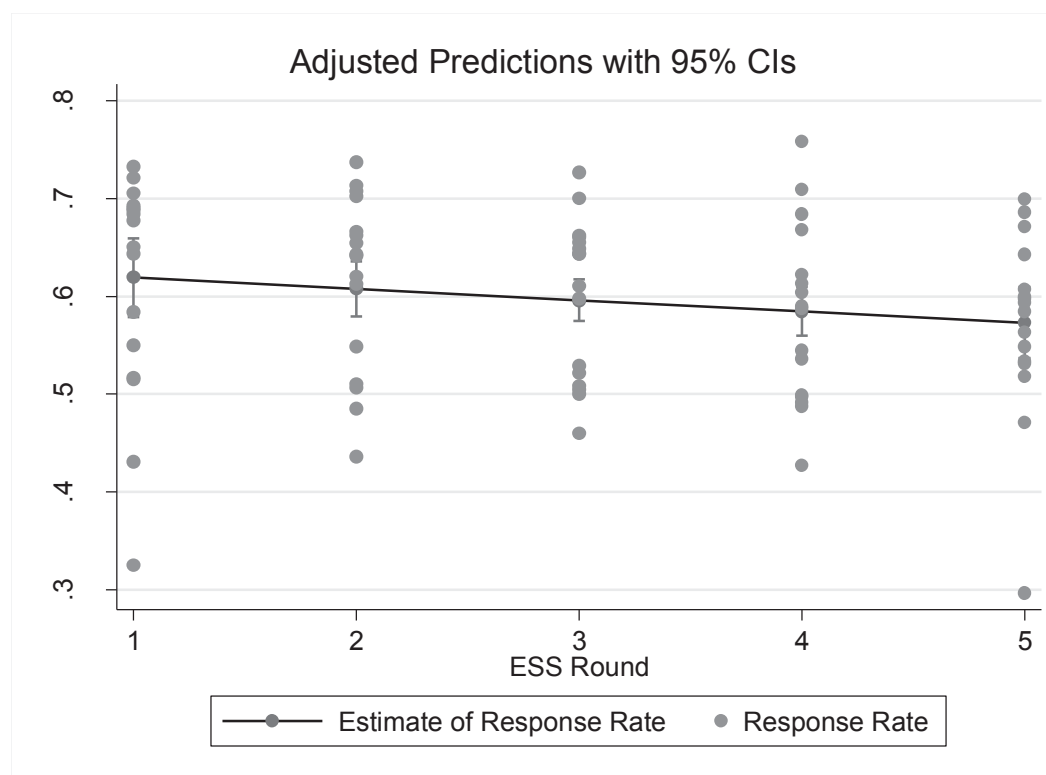
- Research gap?

Up to date comparable information for Europe

# A-Analysis (general)

Pooled Ordinary Least Square Regression (POLS) of the **development of RR** controlled for ESS rounds

**No significant differences**  
(t-Test of independent samples)  
**between the first and the last round ( $p = .284$ ).**

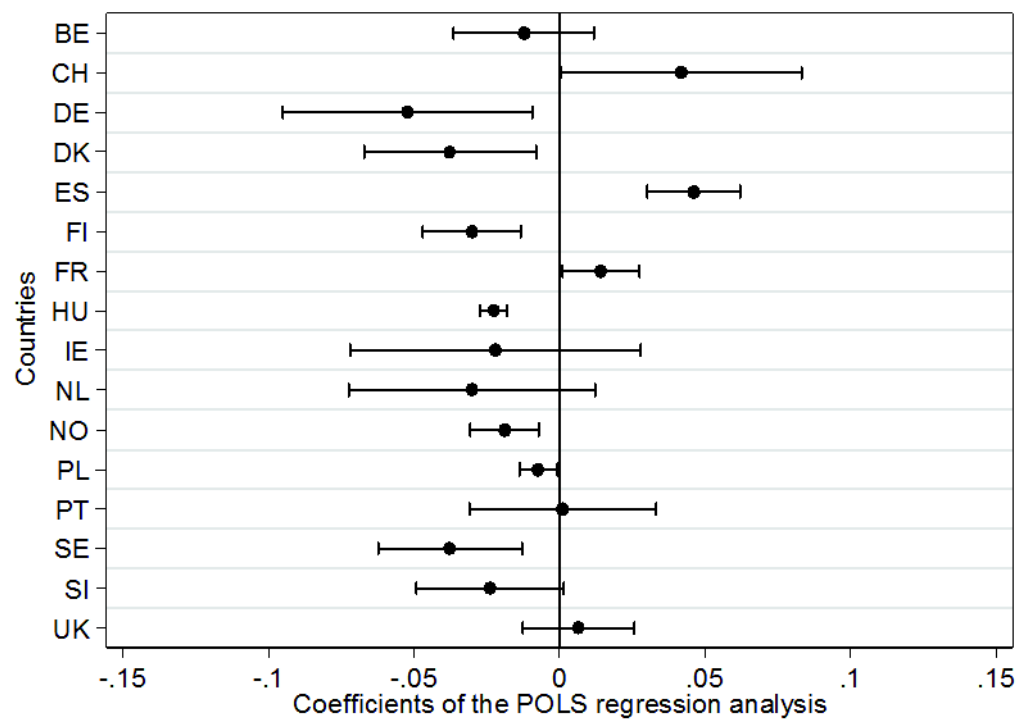


# A-Analysis (country level)

Estimated mean changes in RR for each country between rounds

**Decreasing RR:**

- DE-Germany
- DK-Denmark
- FI-Finland
- HU-Hungary
- NO-Norway
- SE-Sweden



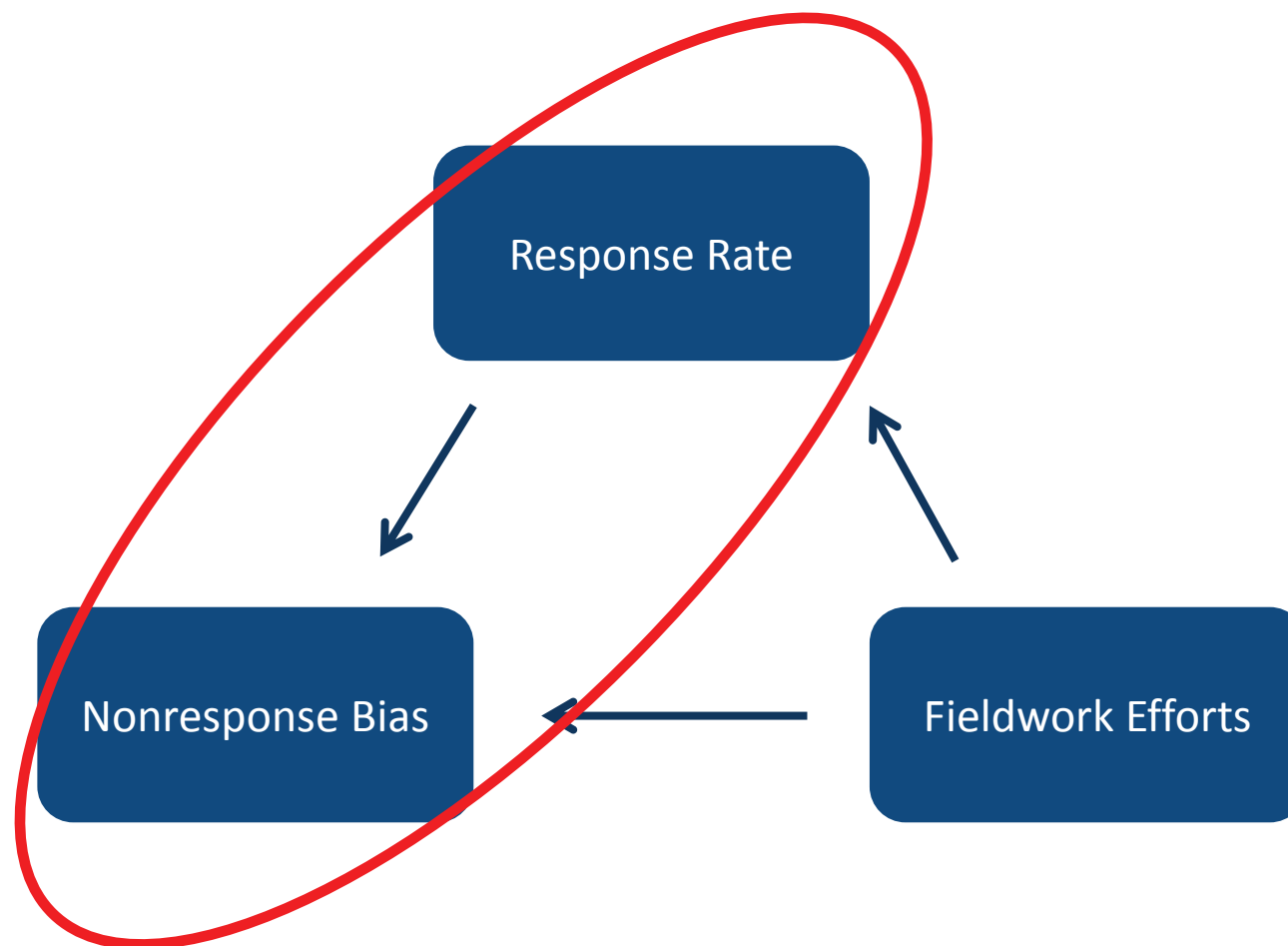
**Increasing RR:**

- CH-Switzerland
- ES- Spain
- FR-France

## A-Result


- RR trend: not decreasing in general
- Different trends in different countries
  - RR are decreasing in DE, DK, FI, HU, NO, SE
  - RR are increasing in CH, ES, FR

## B- Response Rate and Nonresponse Bias



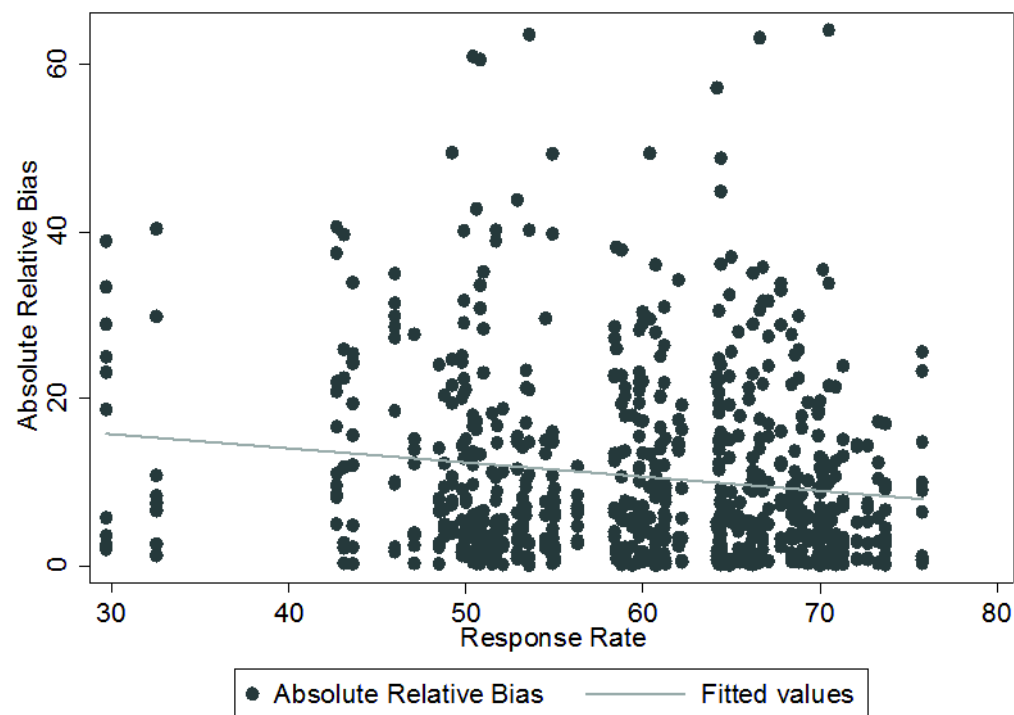


## B- Response Rate and Nonresponse Bias

- **Hypothesis:**  
High RR → lower risk of Nonresponse Bias (NRB).
  - **Analysis:** 16 countries for 7 socio-demographic variables (age, gender, education, occupation, nationality, household size, marital status)
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# B-Analysis (general)

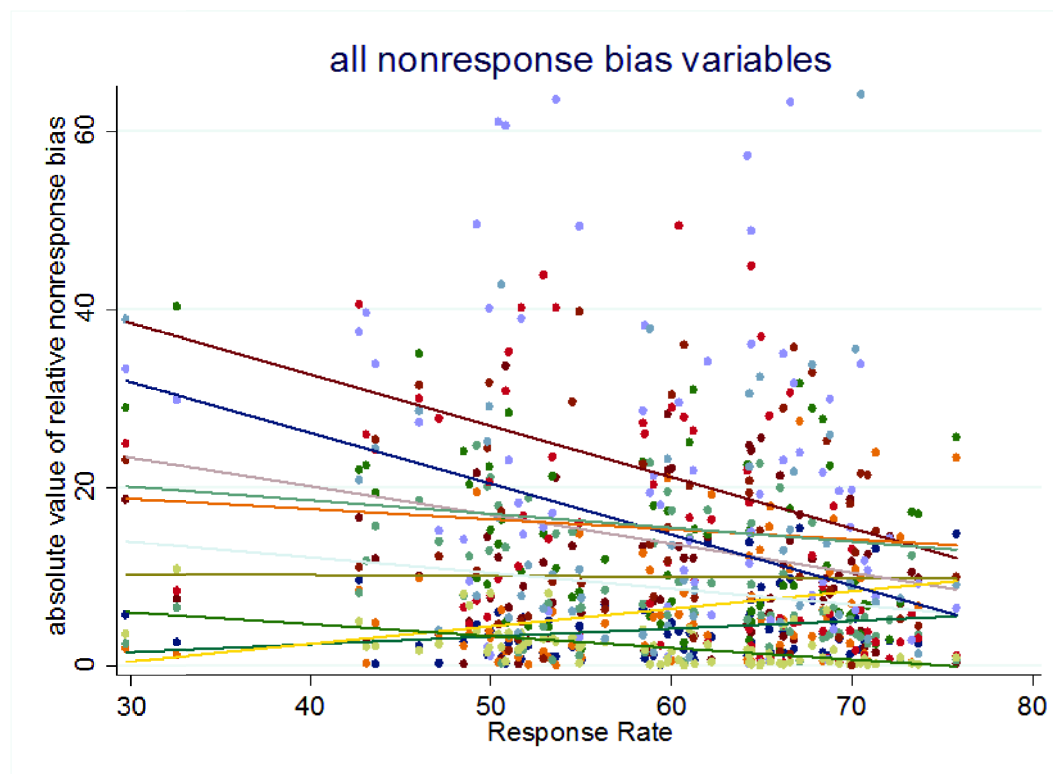
Nonresponse bias (absolute value of relative bias) and response rate



Linear regression analysis : negative and significant correlation (coef=  $-0.17$ ;  $t = -3.85$ ;  $p = .000^{**}$ )

# B-Analysis (variable specific)

## Nonresponse Bias (absolute value of relative bias) and response rates




Higher RR are correlated with **lower** Nonresponse Bias for:

- Old persons
- Married person
- Persons with low education
- Persons with low education
- Nationals of country
- 1-person household

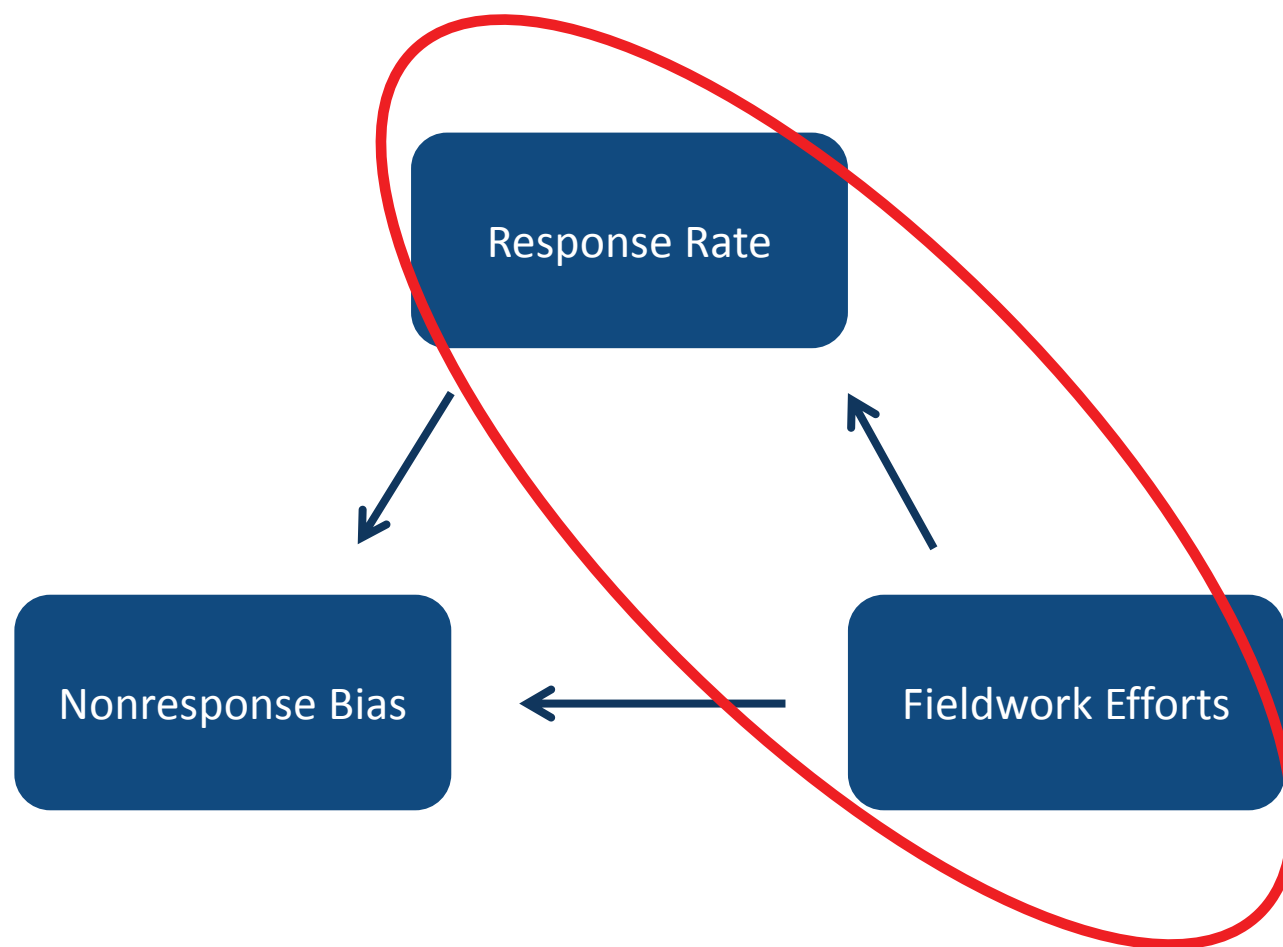
Higher RR are correlated with **higher** Nonresponse Bias for:

- Gender (male)
- 5- and more person household


## B-Result

- RR has effect on Nonresponse Bias
  - Variable specific effects:
    - As assumed: old persons, married persons, low education, high education, nationals of country and 1-person household
    - Against assumption: gender (male), five-and more person household
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## C- Response Rate and Fieldwork Efforts



## C- Response Rate and Fieldwork Efforts

- **Hypothesis:**  
Higher fieldwork effort → higher the RR
  - **Analysis:** ESS offers comparable data on fieldwork efforts
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# C-Analysis (cross-sectional)

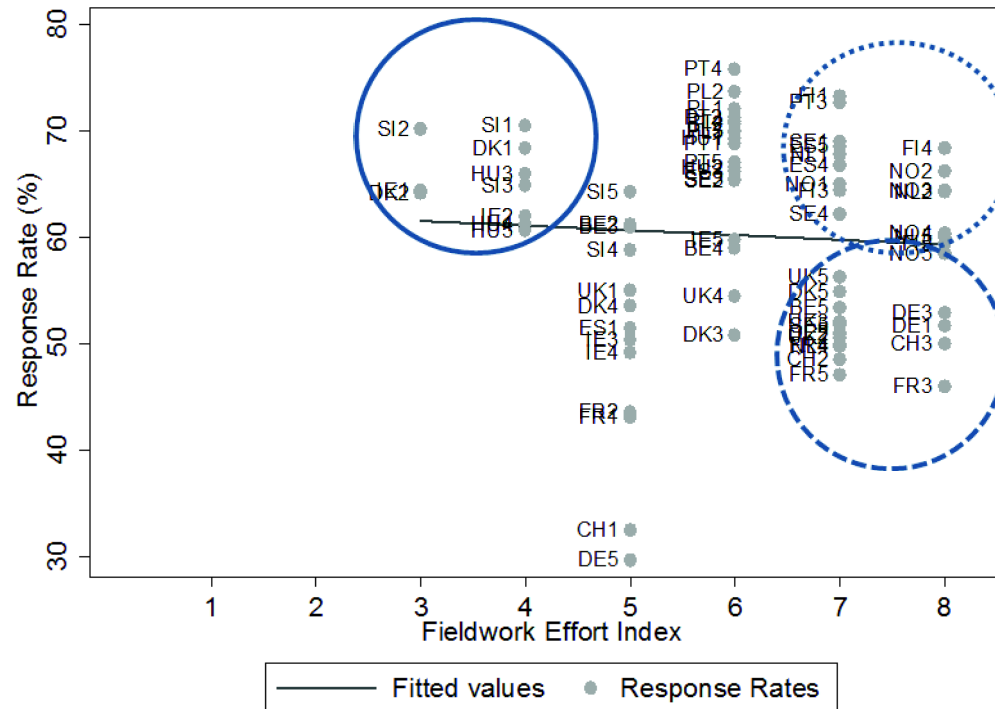
## Fieldwork Effort Index (FEI): Interviewer

- Experience of interviewer
- Payment of interviewer
- Personal briefing of interviewers
- Length of personal briefing sessions
- Interviewer trained in refusal conversion

## Contact to respondent

- Use of advance letter
- Use of brochure
- Use of respondent incentive

(Based on Stoop et. al. 2010)

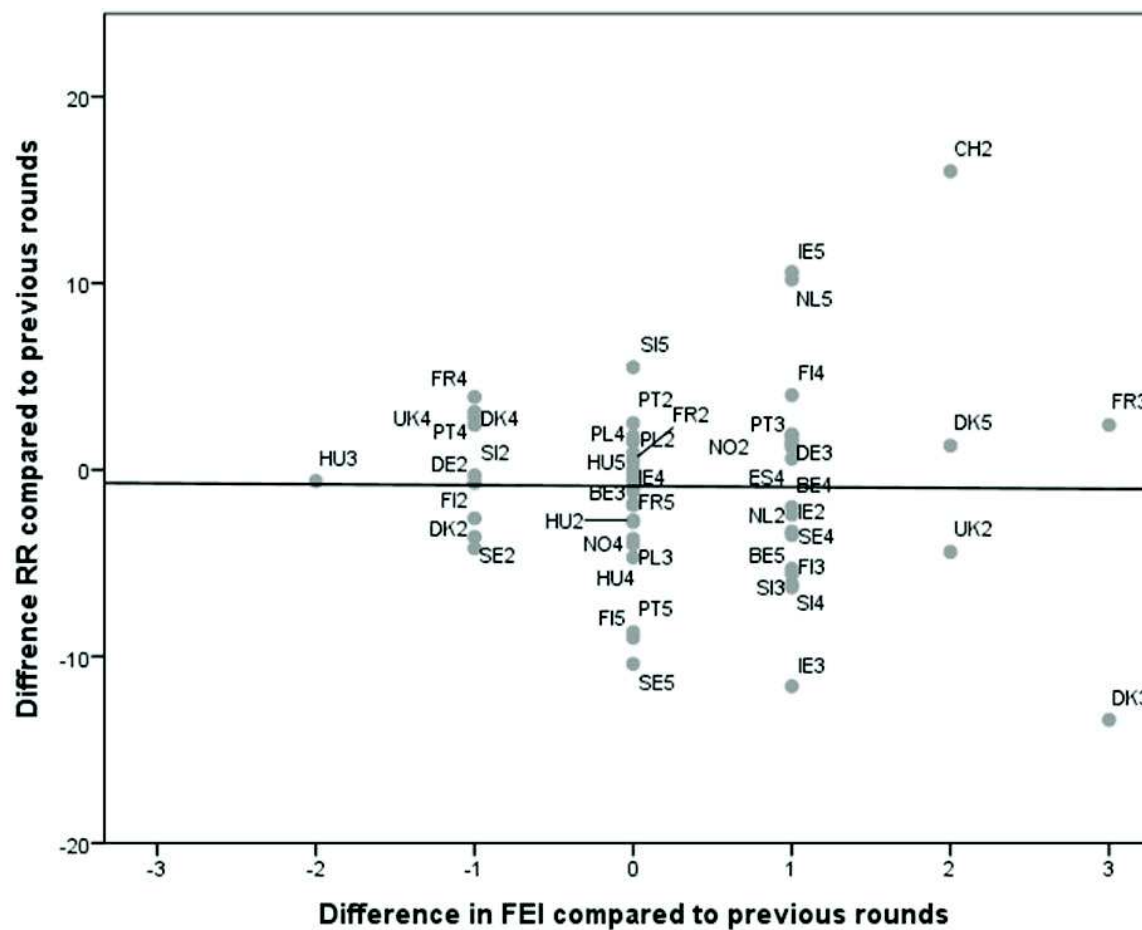


Non sig. correlation.

Pearson correlation coefficient ( $r = -.06$ ;  $p = .596$ ;  $n = 74$ )

# C-Analysis (longitudinal)

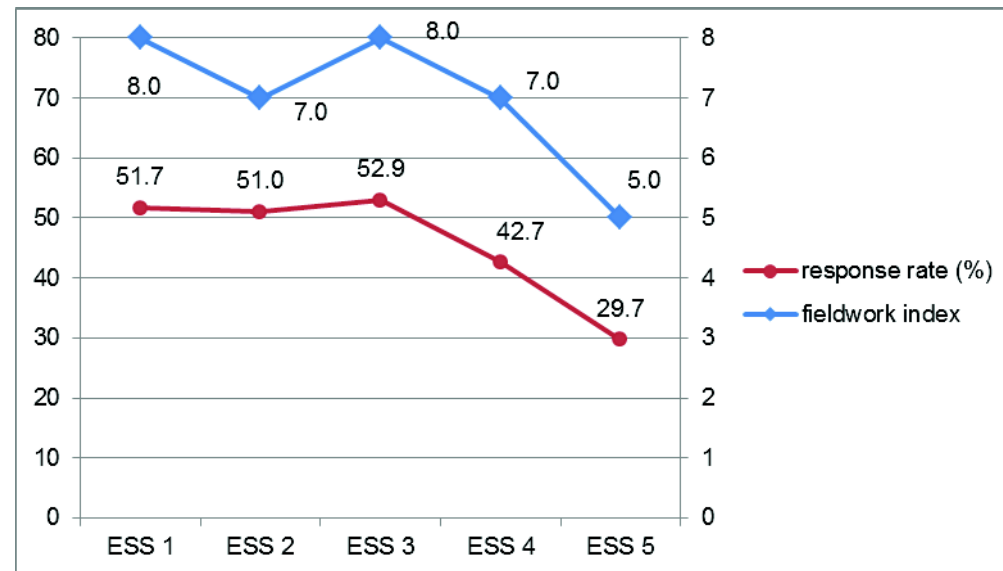
Non sig. correlation  
 Regression analysis  
 ( $r = .13$ ;  $p = .361$ ,  $n = 54$ ;  
 $R^2$  (linear) =  $.016$ ;  $n = 4$ )






# C-Analysis (qualitative-Germany)

## Decreasing RR in Germany

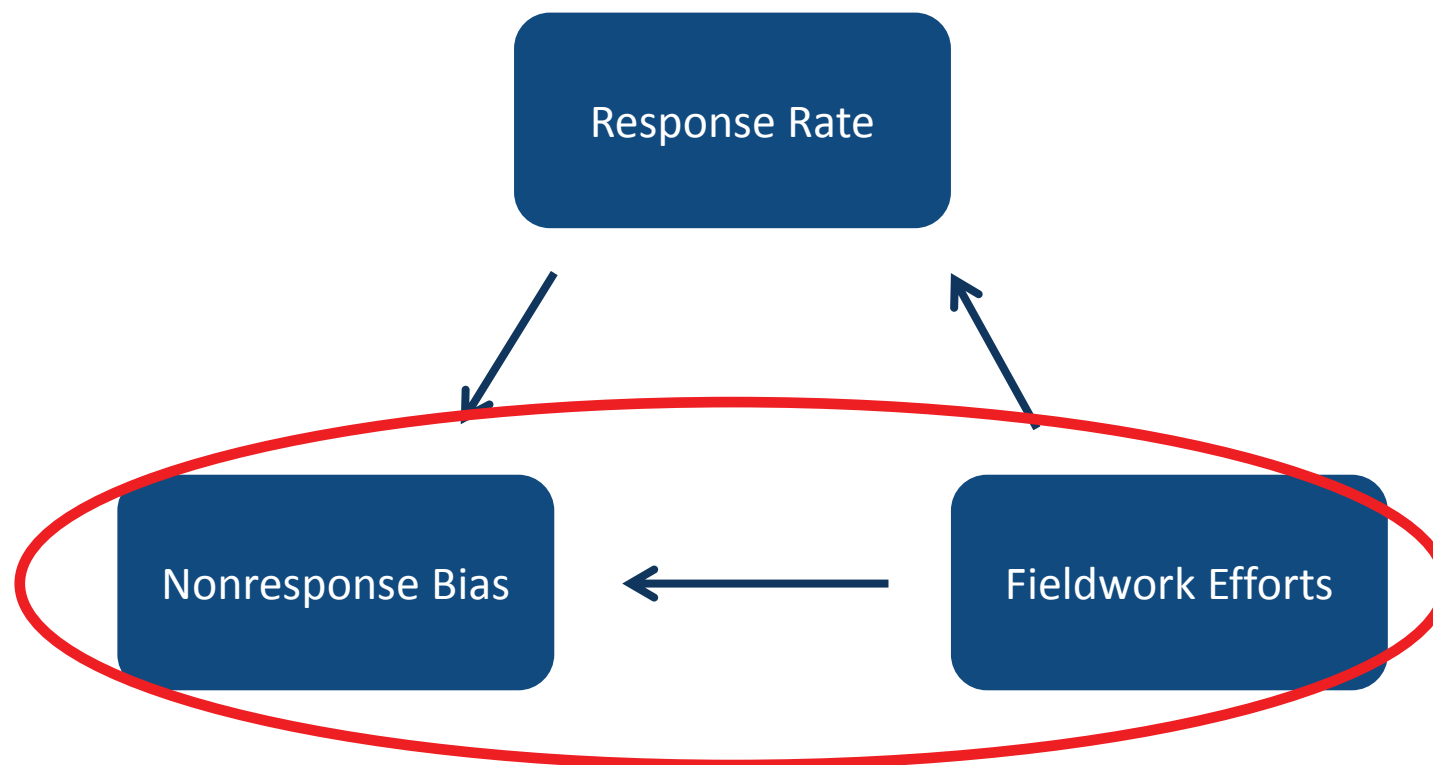


Pattern: the higher the fieldwork effort, the higher the response rate.


## C-Results

- No correlation of FEI and RR.
  - Analysis of change between the rounds (keeping countries constant): change in fieldwork effort did not have a positive effect on RR.
  - At country levels positive effects of fieldwork efforts on RR can be detected.
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## D- Fieldwork Efforts and Nonresponse Bias



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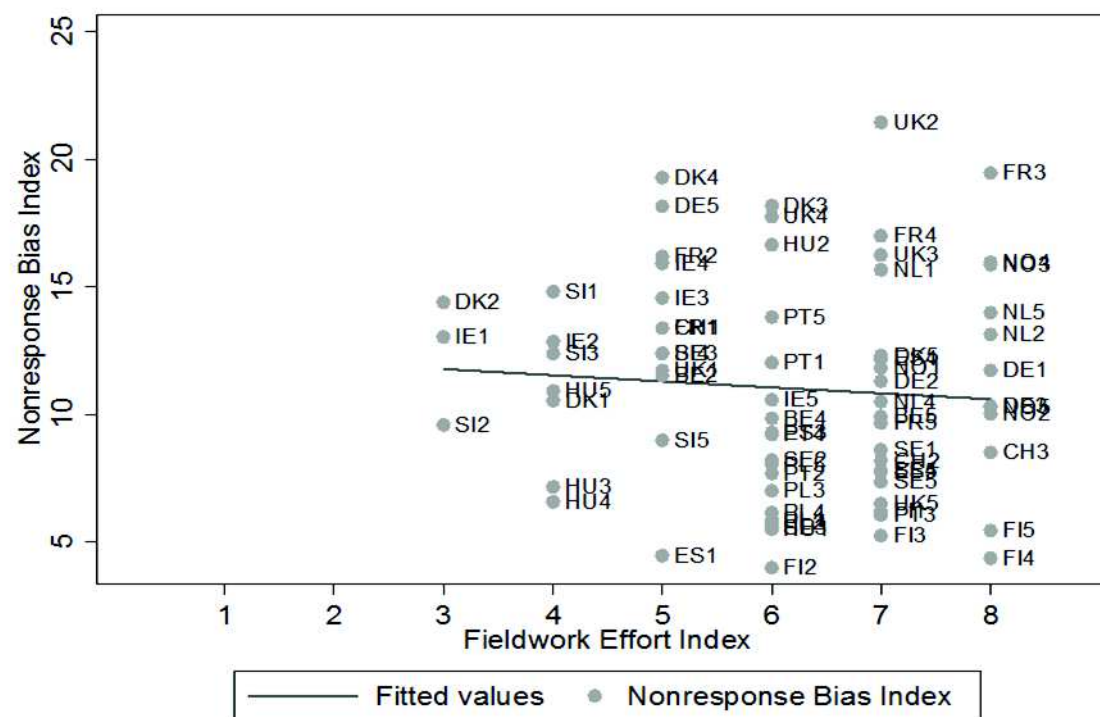
- **Hypothesis:** Higher fieldwork effort → lower NRB
  - **Analysis:**
    - ESS offers comparable information on fieldwork efforts.
    - Data of the ESS can be harmonized with the LFS data for nonresponse bias calculation.
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# D-Analysis (general)

## FEI and Nonresponse Bias Index

**Nonresponse Bias Index** (additive index of absolute value of relative bias):

- Gender
- Education
- Occupation
- Marital status
- Nationality
- Household size



Pearson Correlation Coefficient ( $r = - .08$ ;  $p = .5087$ )  
 Regression ( $coef = - .24$ ;  $t = - 0.66$ ;  $p = .509$ ) ;  $n = 74$

# D-Analysis (variable specific)

## Variable specific analysis of FEI index and NRB

### **MORE FIELDWORK EFFORT IS ASSOCIATED WITH LESS NONRESPONSE BIAS**

Working population (rel. bias)	coef= - .20	p = .089*	n = 74
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High education	coef = - .22	p = .064**	n = 69
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Nationality	coef = - .23	p = .090*	n = 55
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### **MORE FIELDWORK EFFORT IS ASSOCIATED WITH MORE NONRESPONSE BIAS**

Low education	coef = - .23	p = .05**	n = 74
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### **NO CORRELATION**

Gender (male)	coef = - .09	p = .429	n = 74
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Young persons (age 15-24)	coef= - .11	p = .356	n = 74
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Old persons (age 75 +)	coef= - .07	p = .595	n = 64
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Married persons	coef= - .03	p = .798	n = 73
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1- person household	coef= - .10	p = .501	n = 47
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5- and more person household	coef= - .18	p = .234	n = 72
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## D-Results


- Fieldwork efforts are not correlated with lower NRB in general.
- Effects of fieldwork efforts on the NRB for certain variables:
  - For variables related to contactability (working population, high education, nationality): more fieldwork effort decreases NRB.
  - For variables related to refusal: no effect.
- Fieldwork efforts have country and variable specific effects on NRB.

## Conclusion and Discussion

- Data from the ESS and the comparison of ESS and LFS allows testing assumptions on data quality in fieldwork regarding the factors: **Response Rate, Nonresponse Bias and Fieldwork Effort.**
  - Assumptions are not always reflected in the data.
    - Fieldwork Efforts are important in the discussion of data quality. More attention should be given to this aspect, especially at the **country level.**
    - The development and relations are **variable and country specific.**
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## Lesions Learned

- Fieldwork processes should be **communicated** openly and **standardized** for comparability reasons.
  - Fieldwork should be tailored according to country specific circumstances: country specific **NRB** as well as to the **variables of interest**.
  - **Tailored fieldwork effort** at the variable and country level allow increasing data quality by increasing RR and decreasing NRB.
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# Thank you!

For questions and comments:  
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