



# DEALING WITH NONRESPONSE BIAS IN ESS: Reflections on the opportunities of random samples *(WITH FOCUS ON DATA FROM SPAIN)*

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# Main question

**Question:** *how to assess the quality of the obtained sample in a cross-nation context when strict random samples are use?*

**Discussion:** *what of the procedures that are applied in ESS are applicable with quota samples?  
Are other procedures possible?*



# Outline

1. Short introduction on bias in cross nation context
2. Information about response rates and response quality in ESS: highlights (*examples from ESS round 4 (2008) with focus on Spain*)
3. The assessment of bias in ESS (*focus on Spain round 4*)
4. Is this possible with quota samples? Some statements and discussion



# 1. Short introduction: bias in cross-nation research

**non-response** = an important threat to the validity of survey research, even when random samples are used



*failure to obtain measurements for all sample units*

**Reason: non-response is not random** and related to target variables in a survey

this is the core hypothesis (Ho) that researchers should **try to reject**



in practice of opinion polls Ho: “*non-response is random*” **is taken for granted!**

# bias in cross-nation research

- Nonresponse bias is determined by **two** factors:
  - **Nonresponse rate**
  - **Differences** between respondents and non-respondents  
(*e.g. differences in means and variances*)
- These 2 factors differ from one country (sample) to another => artificial differences btw samples
- International comparisons need adjustments for non-response bias if *serious bias is detected (expected)*
- **Consequence** = information on response **rates** and on **differences** is a **prerequisite** for serious analysis of the obtained data

# bias in cross-nation research

**Main problem:** how to obtain relevant information about the non-respondents?

this is the main question behind the procedures used in ESS.

**Crucial = call record data from each random selected sampling unit**

**is this possible with quota samples? How?**

## 2. Information about response rates and response quality in ESS: highlights

### **Call record data: extensive information about response rates & contacting procedure**

- Based on documentation of the **planned random samples** (*selection probability of each selected unit in sample*)
- Plus information in **contact forms** (*call record data of each selected sample unit*)
  - # of contact attempts (visits) per selected case
  - timing of each contact
  - outcome of each contact attempts (interview, non-contact, refusal... extensive coding of each outcome)
  - reasons for refusal
  - likelihood of future cooperation (in case of re-visit)
  - observable information about sample unit (gender, age estimation, housing information, neighbourhood information

# Information about response rates

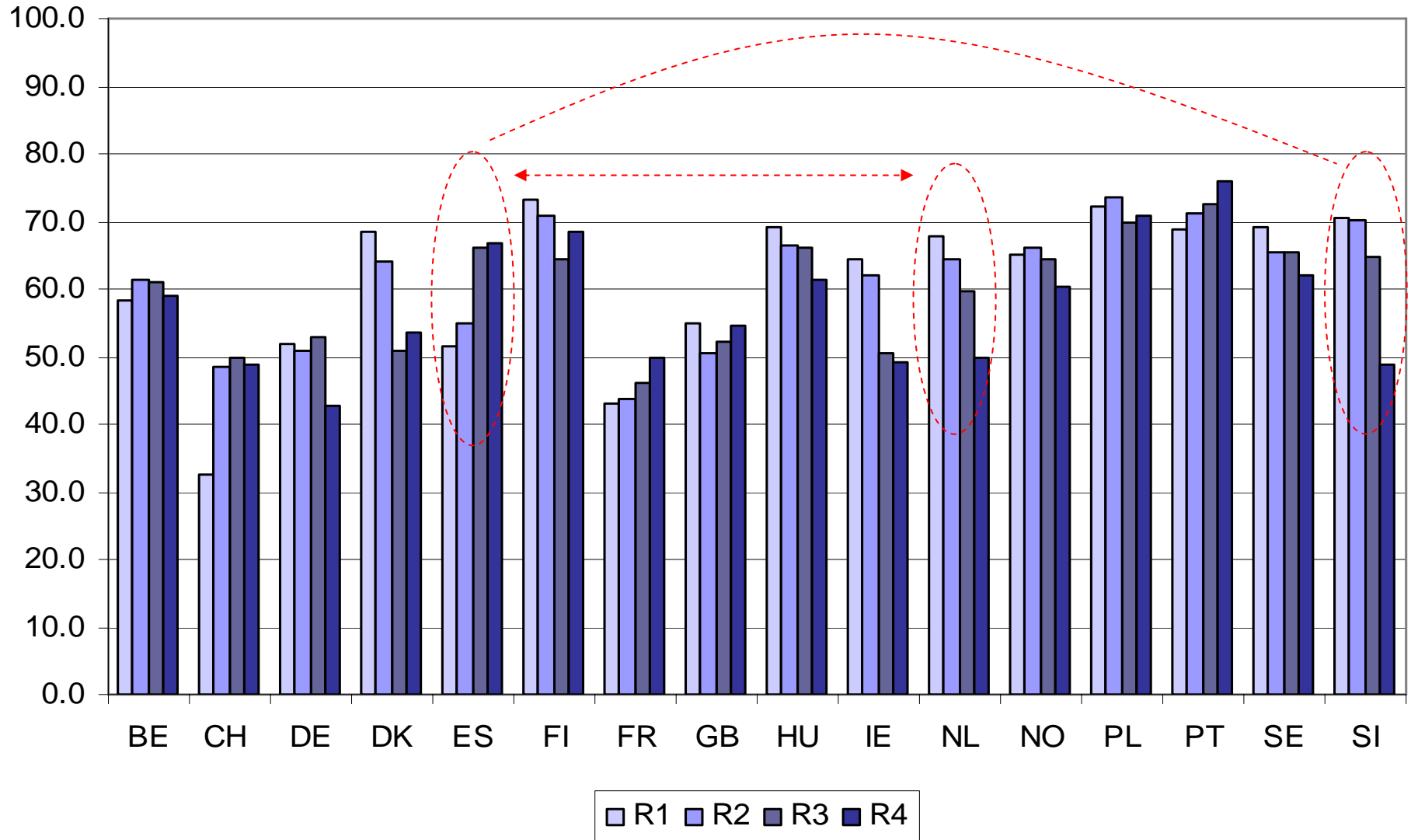
- Comparable because computed on a standard way (CF)
- Major components of NR
  - refusal
  - non contact
  - not available
  - other
- Norm for response is 70%
- Norm for non-contact = max. 3%



# Information about data quality

- Comparing response rates between countries and within countries over time
- Comparing non-contact rates...
- Comparing according to kind of sample (HH, ADDR, IND)
- Effect of each additional contact attempt (useful to plan minimum # of contacts in each country minimally)
- How effective is refusal conversion?
- Who are the non-respondents? The likelihood of NR according to relevant variables...
- NR adjustment (*not in this presentation*)

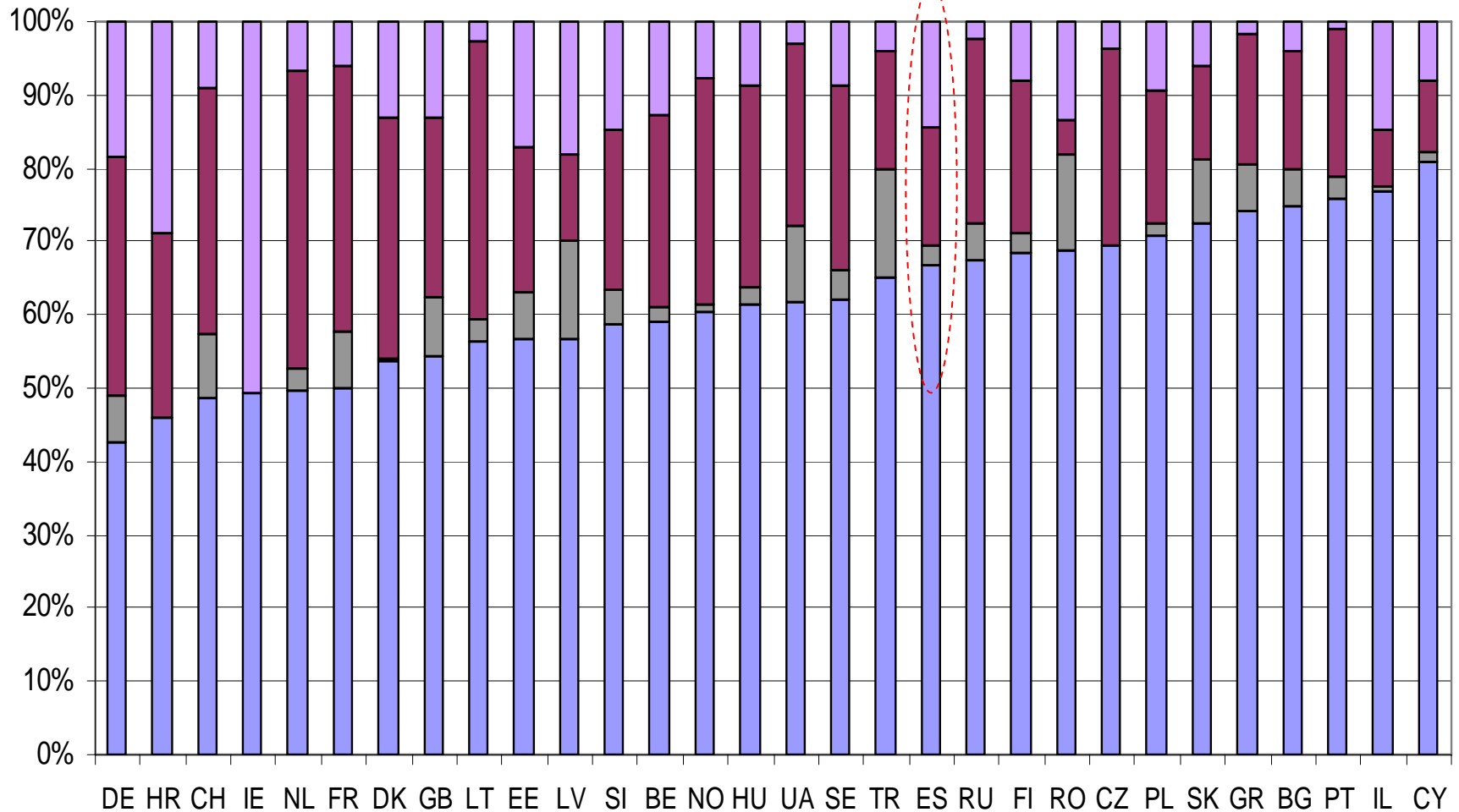
# Response rates (%) for four ESS rounds (CF data) 16 countries that participated in all rounds



# Comments: response rates over ESS rounds

- Countries that start low in R1 improve round after round at cost of large investment
- Countries that start high have difficulties to keep these figures as high as before
- Compare ES with NL and SI
  - ES more effort (increased btw R1-R2)
  - change in NC + much more effort of team
  - other survey org.
  - improved samples (less ineligibles in sample)
  - decrease in non-contact rates
  - electronic CF

# Final response outcomes of total eligible samples (ESS R4)

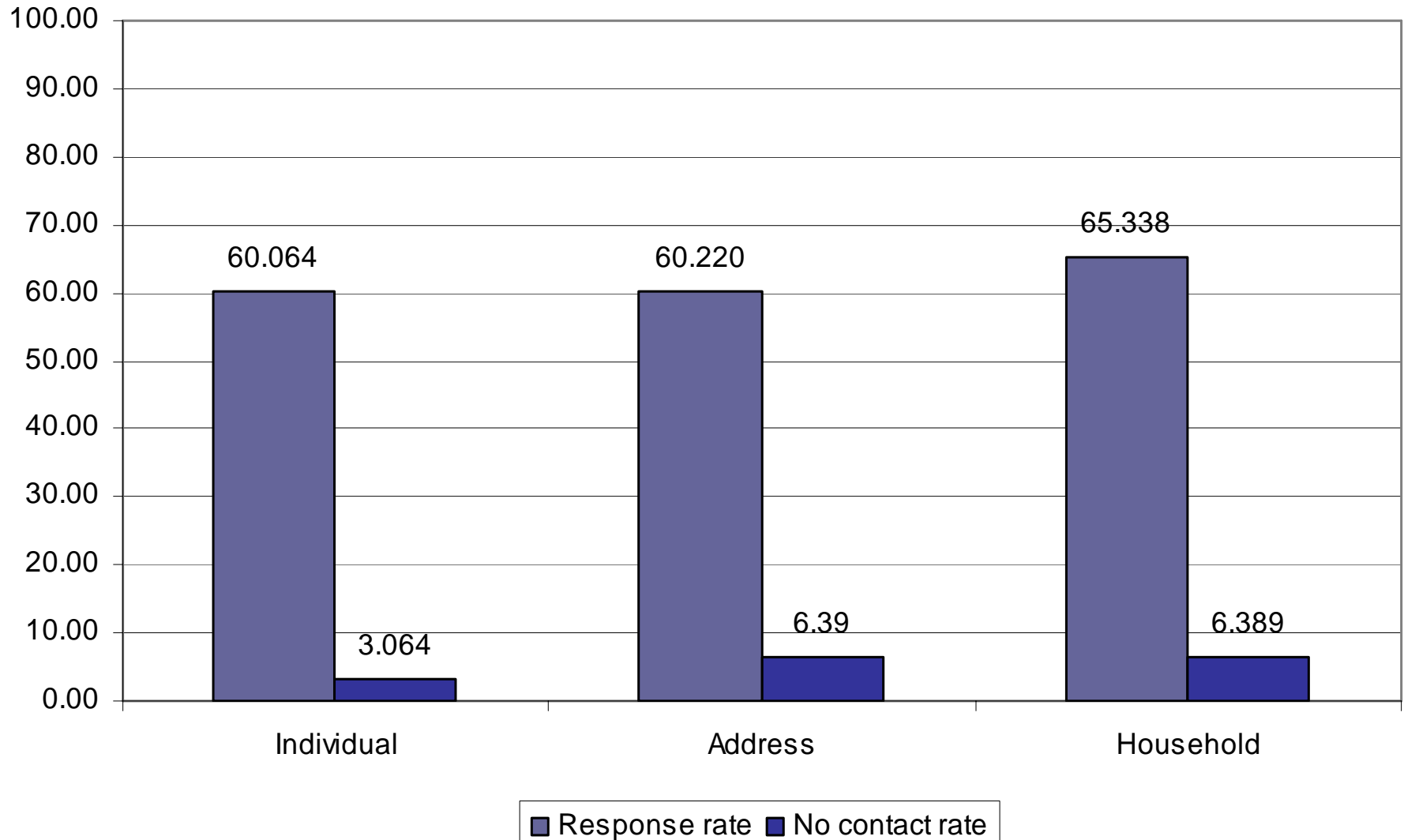


■ response rate ■ non-contact rate ■ refusal rate ■ other nr

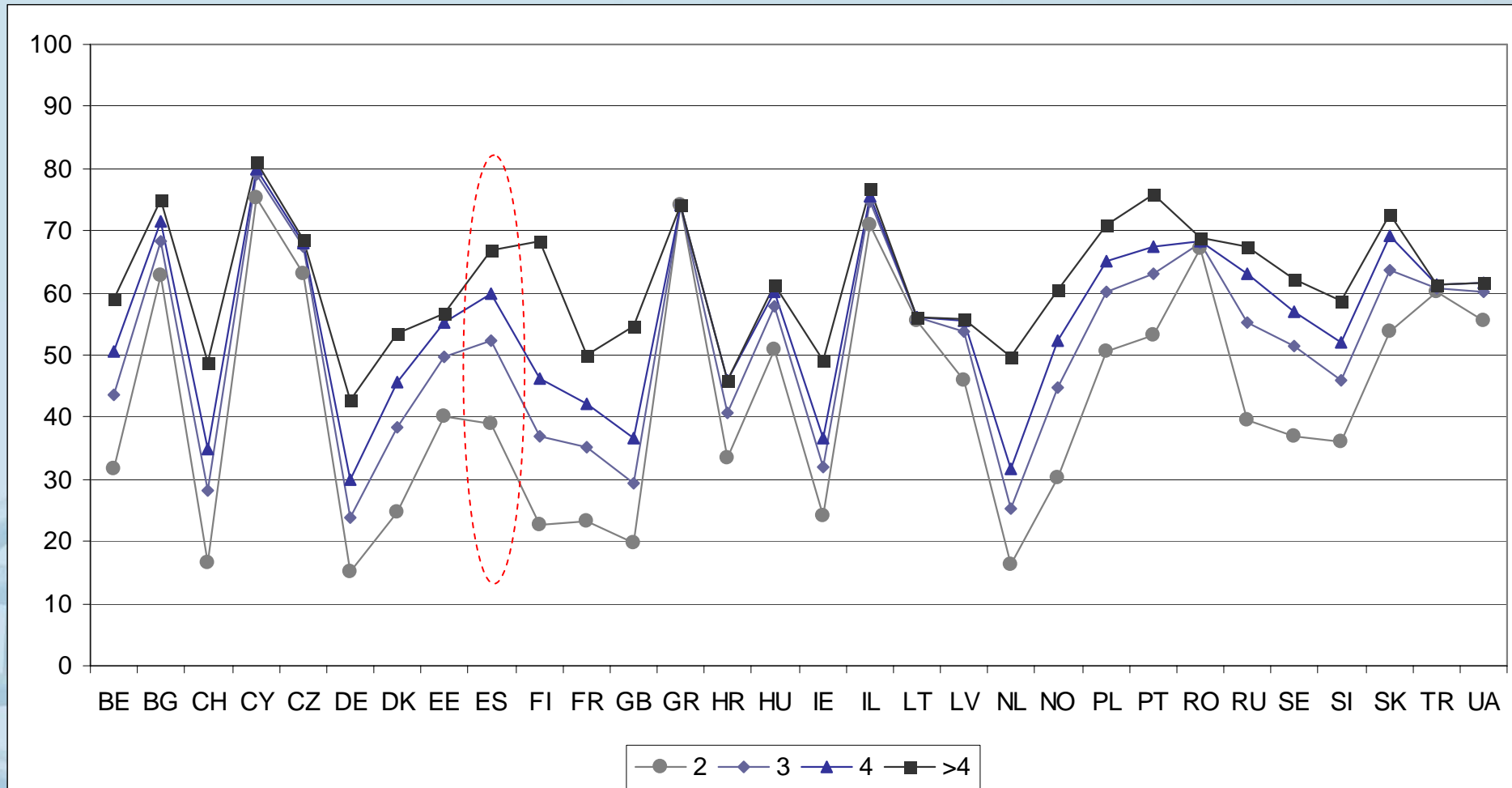
# Comments: variation in non-response categories

- Large variation in refusal rates
- Refusal highest > 30% in DE, CH, NL, FR, DK, LT, NO
- non-contact > 6% in CH, DE, EE, FR, GB, GR, IE, LV, RO, SK, TR, UA  
(red=individual named sample)
- 7 out of 31 countries meet the norm
- 6 out of 31 < 50% response
- ES > 65% response

# Average country level response rates and non-contact rates according to type of sample (ESS R4)



# Obtained response rates (%) after 1-2, 3, 4 and more than 4 contact attempts (ESS R4)



# Comments: cumulative of # visits on final response

- Very different patterns in cumulative response
- Rather high from the first visit in the East (central) and South European countries
- Small effect of > 4 visits:  
BG, CY, EE, GR, HU, IL, LT, NL, RO, TR,



# 3. Assessment of bias in ESS

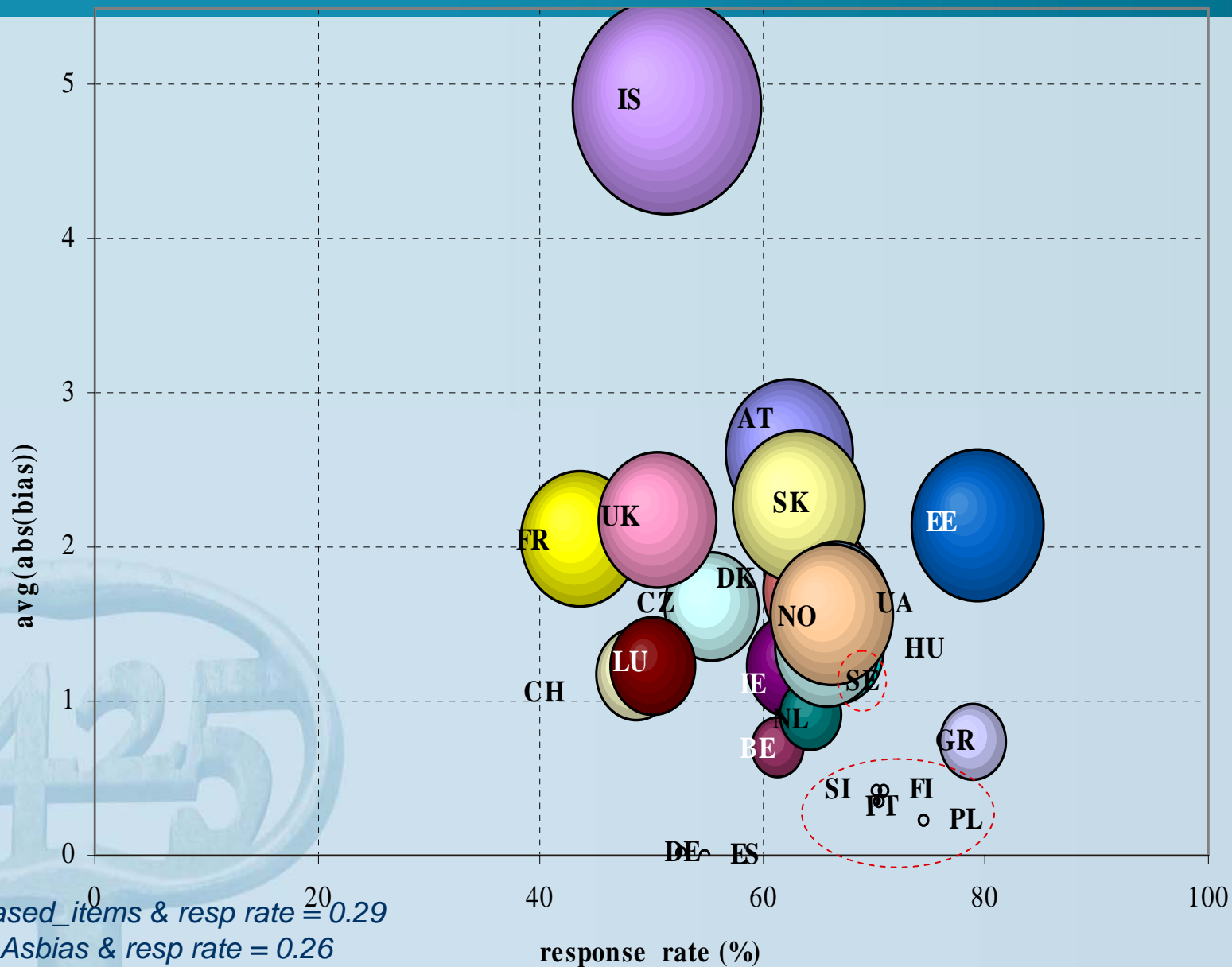
## Approaches to the assessment of bias applied in ESS

- Bias as deviation between obtained sample and population (or 'Gold standard' survey) (*post-stratification*)
- Bias as difference between cooperative and converted refusals collected via refusal conversion (*explaining NR*)
- Bias as difference in 'observable' data among respondents and non-respondents (collected in contact forms) (*explaining NR*)
- (Bias as difference between respondents and non-respondents collected via post hoc nonresponse surveys) (*propensity score weighting*)

## 3.1. Post-stratification

- An impression of size and direction of bias
  - underestimation of bias because small number of PS variables (gender, age, education, region) and weak relation to target variables
- Procedure: compare the PS-weighted sample with the un-weighted on large number of relevant variables in questionnaire (see figure Round 2)
- Helps to detect “**usual suspects**” of bias (countries and variables)

**Figure:** The absolute average standardised bias (49 questions R2) in relation to the response rate of the country samples (*source: Vehovar, 2007 adapted*)



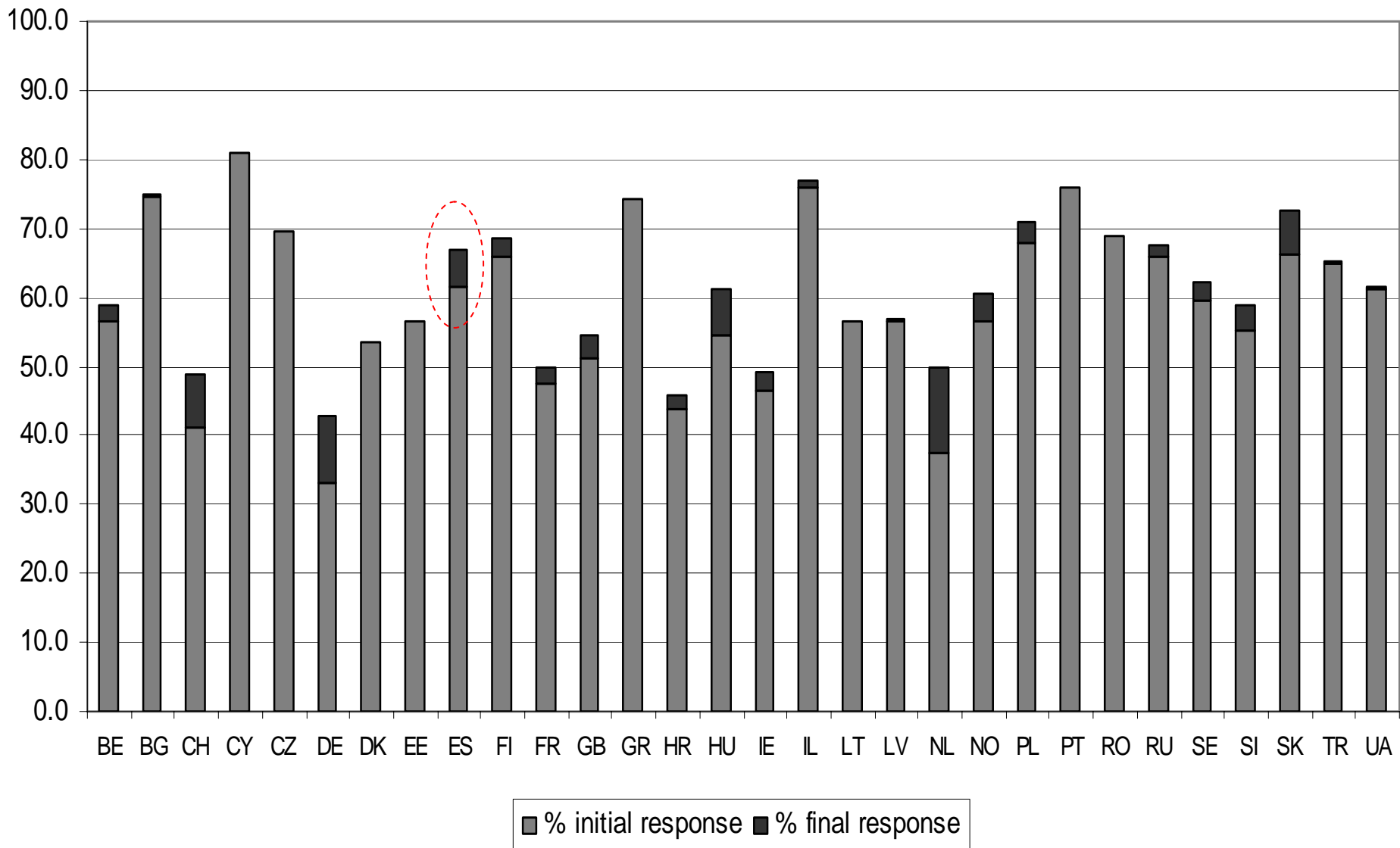
# Post stratification: discussion

- Items most subjected to bias are items on
  - political interest, trust
  - immigration items,
  - media use
  - participation in organisations
- Effect of PS weighting on distributions of variables is small and nearly no effect on regression parameters in substantive models
- Quota sampling: only applicable when the PS variables are not included in the quota strata variables (*e.g. when quota's for gender, age, and geographical unit are used as quota frame are PS weights per definition in-effective (except joint distributions?)*)

## 3.2. Refusal conversion

- What? : re-approaching refusals at later occasion
- How effective? (*ESS round 4*)
- Relation between reason for refusal and refusal conversion (*e.g. Spain round 4*)
- Relation between estimation of future cooperation and refusal (*e.g. Spain round 4*)
- Prediction of reluctance by relevant variables (*e.g. ES round 4*)
- Is this informative for final response? Not sure?
- Applicable in quota samples?

# How effective is refusal conversion in terms of response enhancement? (ESS R4)



# Comments: effect of refusal conversion on obtained response

- Interviewers do not like it
  - Only successful in small number of countries
  - Depend much on decisions of interviewers and survey organisations
- e.g. relation between estimated future cooperation by interviewer and reluctance



# Reasons for refusal (first contact) among cases who ever refused and among refusals who were converted at later occasion

reasons	On number of responses		On number of cases	
	Ever refused	Reluctant resp.	Ever refused	Reluctant resp.
bad experience	4	1	0.6	0.5
bad timing	82	52	13.2	<b>26.3</b>
do not like	24	8	3.9	4.0
do to often	5	0	0.8	0.0
never do	77	21	12.4	10.6
no approval	9	3	1.4	1.5
no trust	38	7	6.1	<b>3.5</b>
not admit strangers in H	6	5	1.0	2.5
not interested	452	113	72.7	<b>57.1</b>
privacy	32	10	5.1	5.1
too difficult	9	18	1.4	<b>9.1</b>
wast money	12	1	1.9	0.5
wast time	133	42	21.4	21.2
other	57	22	9.2	11.1
Total #	940	303	622	198

# Comments: on reasons for refusal

- Contacted sampling units who initially refuse because of “**bad timing**” or “**too difficult**” are **easier** to convince to cooperate at later occasion
- Contacted sampling units who initially refuse because of “**not interested**” or “**no trust**” are more **difficult** to convince to cooperate at later occasion



Refusal conversion status by estimation of future cooperation (first contact) among the initial refusals (N = 822 column percentages) (Spain R4)

<b>Refusal conversion</b>	<b>Definite not cooperate</b>	<b>Probably not cooperate</b>	<b>Perhaps or likely coop.</b>	<b>NA</b>
Not re-approached	<b>56.9</b>	<b>30.5</b>	<b>5.6</b>	<b>18.2</b>
Re-approached no contact	<b>4.4</b>	<b>4.2</b>	<b>3.7</b>	<b>4.3</b>
Re-approached refusal	<b>20.7</b>	<b>35.3</b>	<b>54..2</b>	<b>47.8</b>
Re-approached interview	<b>18.0</b>	<b>30.0</b>	<b>36.5</b>	<b>34.0</b>
<b>Total #</b>	<b>478</b>	<b>190</b>	<b>107</b>	<b>47</b>

# Comments: estimation future cooperation & refusal conversion

- Most likely of no additional approach of refusals when estimation is “*definitely not cooperate*”
- Re-approach most successful (interview) (36.5%) when estimation is “*perhaps of likely to cooperate*” but refusals are most likely in this category (54.2%) (*compare with marginal % of refusals of 29.8%*)



# Response (cooperative or reluctant) by primary suspects (bi-variate relations)

<b>variable</b>	<i>Chi-square</i>	<i>df</i>	<i>Prob.</i>
Age class (youngest less reluctant)	11.083	5	0.050
Education level (lower more reluctant)	19.415	6	0.004
Urbanisation level (countryside less reluctant)	11.103	4	0.025
Subjective general health ( <i>unhealthy more reluctant</i> )	12.358	4	0.015
Active in voluntary organisation (no more reluctant)	3.279	1	0.070
<b>Metric variables</b>	<i>t-value</i>	<i>df</i>	<i>prob</i>
Not allow immigrants (1-10)	-4.21	2432/219	< 0.001
Negative - positive consequences (1-10)	2.94	2318/187	0.003
Interest in politics (0-7)	2.94	2562/228	0.003
Social trust (0-10)	4.64	2548/228	< 0.001
Total time TV watching (1-4)	2.13	2571/224	0.033
Satisfaction w. state of health care (0-10)	2.39	2550/226	0.017

**Table 1.** Estimation effects of background variables and attitudes on the odds ratio's "reluctant/cooperative" Spain ESS Round 4 (Logistic regression analysis)

Predictors	Model 1		Model 2	
	<i>Odds ratio</i>	<i>(SE)</i>	<i>Odds ratio</i>	<i>(SE)</i>
Age cohort				
15-24	1.881	(0.129)	1.809	(0.136)
25-49	1.935	(0.140)	1.902	(0.141)
50-69	2.331*	(0.179)	2.251*	(0.181)
<i>Ref: +70</i>				
Education				
Lower education	2.694**	(0.156)	1.111	(0.160)
Lower secondary	2.751***	(0.136)	2.373**	(0.138)
Higher secondary	1.858	(0.165)	1.656	(1.167)
<i>Ref: higher education</i>				
Urban environment				
Village	3.609**	(0.209)	3.783*	(0.210)
Small town	4.202***	(0.218)	4.304***	(0.218)
Suburban	1.122*	(0.429)	1.250	(0.430)
Big city	3.430*	(0.234)	3.730*	(0.235)
<i>Ref: country side</i>				
Social trust				
Low trust			1.994	(0.111)
Medium trust			1.287**	(0.109)
<i>Ref: high trust</i>				
Consequences migration				
Negative consequences			1.745***	(0.107)
Moderate			1.105	(0.111)
<i>Ref: positive consuences</i>				

\*  $p < 10$ ; \*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$ ; \*\*\*\*  $p < 0.001$

# Adjustment of sample with propensity score weights?

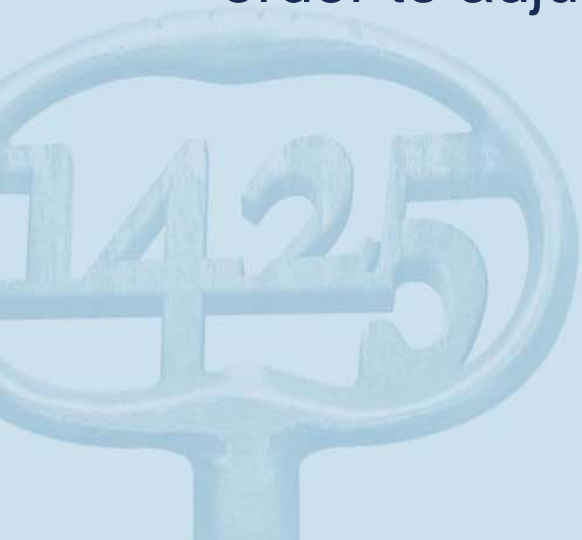
- One can compute propensity score weights at basis of previous model (several methods)  
BUT...
- Problems:
  - Only correction for refusals (not for non-contacted).
  - Are the reluctant respondents a random sample or all non-response?
  - Do initial refusals and non-contacted belong to same population?
  - Are reluctant respondents (converted refusals) a subsample of all refusals?

### 3.3. observable data: effect of neighbourhood and housing variables on reluctance

- Observations of housing and neighbourhood in contact forms = info about all sampled units (response and non-response)
- Data quality better in later rounds
- Example Spain in Round 2: predictors of non-response are
  - living in apartment (*odds ratio initial refusal/cooperative 1.276\*\*\** )
  - bad state of house (*odds ratio initial refusal/cooperative 1.229\*\*\**  
*odds ratio non-contact/cooperative 1.426\*\*\**)
  - apartment X bad state (*odds ratio initial non-contact/cooperative 1.272\*\*\** )
  - litter and vandalism in combination with housing type has effect on refusal and non-contact...

## 3.4. Survey among non-respondents

- Only in Round 3
- In 4 countries
- Using small set of questions (“usual suspects”)
- Possible but expensive
- Estimation of response propensities with these data
- Actual research = trying to **combine the methods** in order to adjust the data for NR bias.



# Discussion...

- Are some of these strategies applicable in quota sampling?
  - If YES: How to implement this?  
What are minimum requirements
  - If NO: other ways of dealing with bias in quota sampling?

