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Undercoverage and nonresponse as sources of representativeness bias in non-probability online panels. The Italian case

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Introduction

- Paper submitted to a journal
- Review the paper
- We discuss the original paper
- Your feedback on:
  - Focus of the paper on nonresponse only?
  - Focus of the paper on the general population only?
  - Use the AAPOR framework?
  - Use a traditional operativisation of Internet population?

Motivations

- Popularity of **non-probability** online panels in market and social research
- Shortage of methodological studies on the quality of data collected from these panels
- No studies in Italy, even if opt-in panels are fairly widespread and used in mixed-mode surveys
- Overall aim: To empirically assess the quality of data collected on a sample of the Italian non-probability online panel *Opinione.net*

- Focus on (Internet) coverage and nonresponse (at different stages of the life of a panel)

Literature review: Internet coverage

- Well-researched topic in the US → socio-economic differences in Internet coverage (e.g. Sterrett et al. 2017)

- Relatively little research in Europe → studies on specific countries and different impact of Internet coverage on the quality of the estimates (e.g. Mohorko et al. 2013)

- No studies in Italy

RQ1: Is the Italian Internet population representative of the general population?

Literature review: nonresponse

Baker et al. (2010).

Stage of the life of online panels
Recruitment
Joining procedures and profiling
Sampling for specific studies
Panel maintenance

Literature review: nonresponse

Baker et al. (2010).

Stage of the life of online panels	**Method to study nonresponse**
Recruitment	Responding sample vs general or Internet population
Joining procedures and profiling	Panelists vs general or Internet population
Sampling for specific studies	Responding sample vs panelists
Panel maintenance	Sampled members who do not drop out the panel vs those who do drop out

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Literature review: Nonresponse

Nonresponse at the recruitment stage

- Well-researched topic in the US → non-representative samples and biased estimates (e.g., Dutwin and Buskirk, 2017)
- Little research in Europe → same results as in the US (e.g., Erens et al., 2014)
- No studies in Italy

RQ2. Is the responding sample representative of the Internet and the general population?

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RQ2. Is the responding sample representative of the Internet and the general population?

Nonresponse at the joining & specific study stages

- Very few studies (Pedersen e Nielsen, 2016; Alvarez *et al.*, 2003)

RQ3. Are the panelists representative of the Internet and the general population?

RQ4. Is the responding sample representative of the selected (initial) sample and the panel?

Overview of research questions

COVERAGE	*RQ1. Is the Italian Internet population representative of the general population?*
NONRESPONSE **Stage of the life of online panels**	**Method to study nonresponse**
Recruitment	*RQ2. Is the responding sample representative of the Internet and the general population?*
Joining procedures and profiling	*RQ3. Are the panelists representative of the Internet and the general population?*
Sampling for specific studies	*RQ4. Is the responding sample representative of the selected (initial) sample and the panel?*

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Joining procedures and profiling	*RQ3. Are the panelists representative of the Internet and the general population?*
Sampling for specific studies	*RQ4. Is the responding sample representative of the selected (initial) sample and the panel?*
WEIGHTING	ONLY RQ2

Data

Data source	Reference time	Data collection mode	Type of sample	Final sample*
Gold-standard: Aspects of Everyday Living - AEL	2015	face-to-face	probability	37,825

* Adult population (aged 18 and over).

Data

Data source	**Reference time**	**Data collection mode**	**Type of sample**	**Final sample***
Gold-standard: Aspects of Everyday Living - **AEL**	2015	face-to-face	probability	37,825
Opinione.net panelists	2017	web	non-probability	8,071
Italians' Living Conditions - **ILC** (subsample of *Opinione.net*) - incentive: 0.40 euro - reminder: one e-mail reminder - questionnaire: Internet use and life styles - length: 6 minutes - AAPOR Cooperation Rate 1: 52.7%	2017	web	non-probability	2,007 (initial sample: 3,908)

* Adult population (aged 18 and over).

Methods 1: Internet population

- New definition of «Internet population»

a fraction of the general population who:

i) regularly accesses and uses the Internet from any location, regardless of the device used, and

ii) is able to use the Internet

Methods 2: Metrics

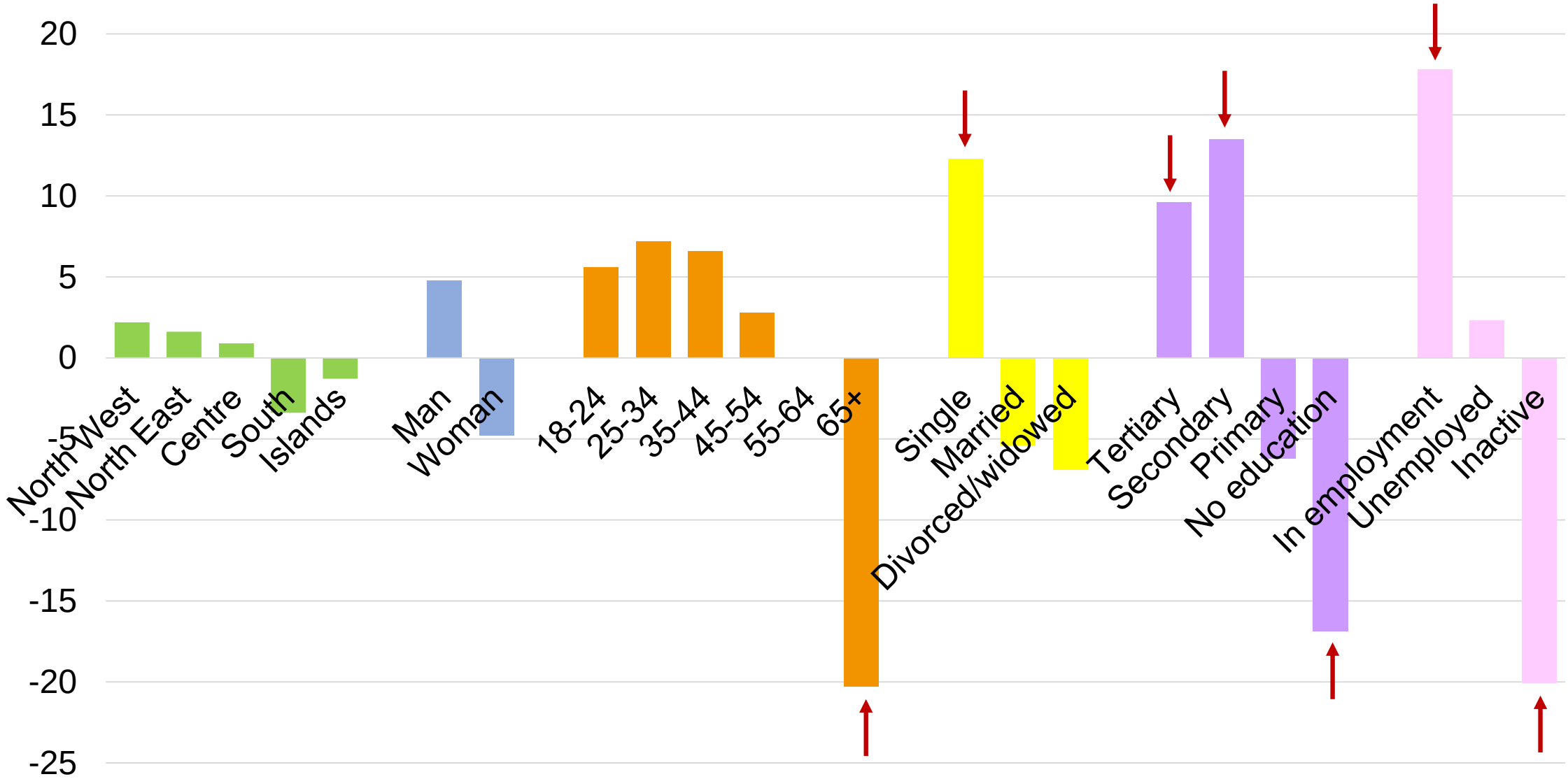
- 5 Accuracy metrics (Yeager *et al.*, 2011)
  - POINT MEASURES
    - Percentage point error (0-100)
    - Largest absolute error (0-100)
  - OVERALL METRICS
    - Average absolute error (0-100)
    - Number of significant differences from benchmarks (0-6)
    - Number of absolute differences greater than three given thresholds (0-23)
      → our proposal

- Variables used for the analysis
  - Primary demographics (gender, age, education, and geographic area of residence)
  - Secondary demographics (marital status and occupation)

Methods 3: Weighting

- Quasirandomization weighting (Valliant and Dever, 2018)
- Logistic regression model
  - propensity scores (pseudo-weights)
  - socio-demographics (gender, age, education, and geographic area of residence)

Results RQ1: Internet coverage



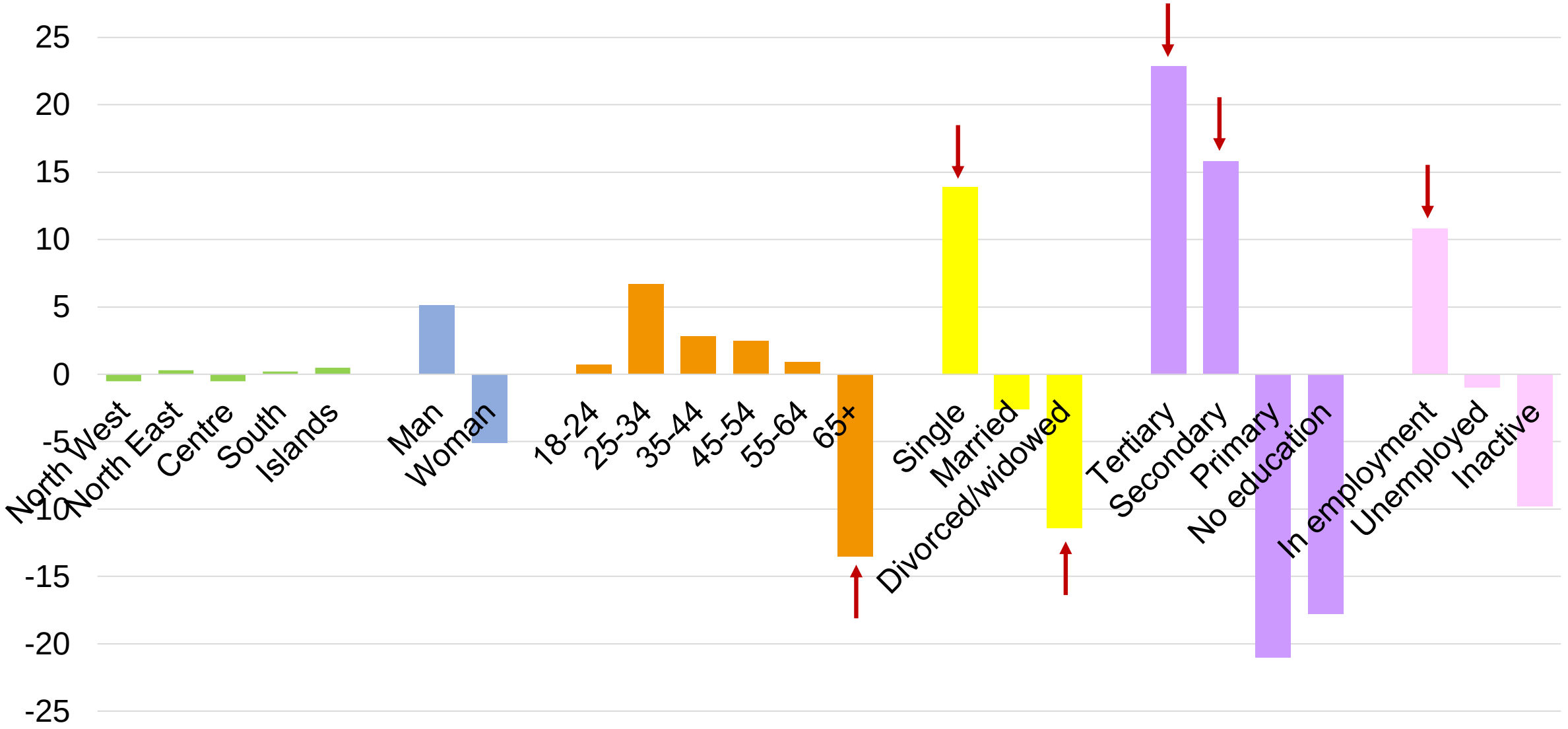
Note: p≤0.001 for all the variables.

Results RQ1: Other accuracy metrics

	Internet coverage	Recruitment				Joining		Specific study	
Accuracy metrics	Internet population vs general population	ILC respondents vs Internet population		ILC respondents vs general population		Panelists vs		ILC respondents vs	
		No weights	Weights	No weights	Weights	Internet population	general population	selected panelists	panel members
Average absolute error	11	3.2	2.0	7.9	1.7	3.3	9.4	0.7	4.2
Number of significant differences from the benchmark	6	5	6	5	6	6	6	1	5
Largest absolute error	20.3	7.1	8.3	15.8	5.1	7.3	18.8	1.2	7.6
Number of absolute differences greater than:									
5 percentage points	6	2	4	4	3	6	1	0	3
10 percentage points	2	3	0	6	0	2	7	0	0
15 percentage points	4	0	0	4	0	0	3	0	0

Results RQ2: Nonresponse at the recruitment stage

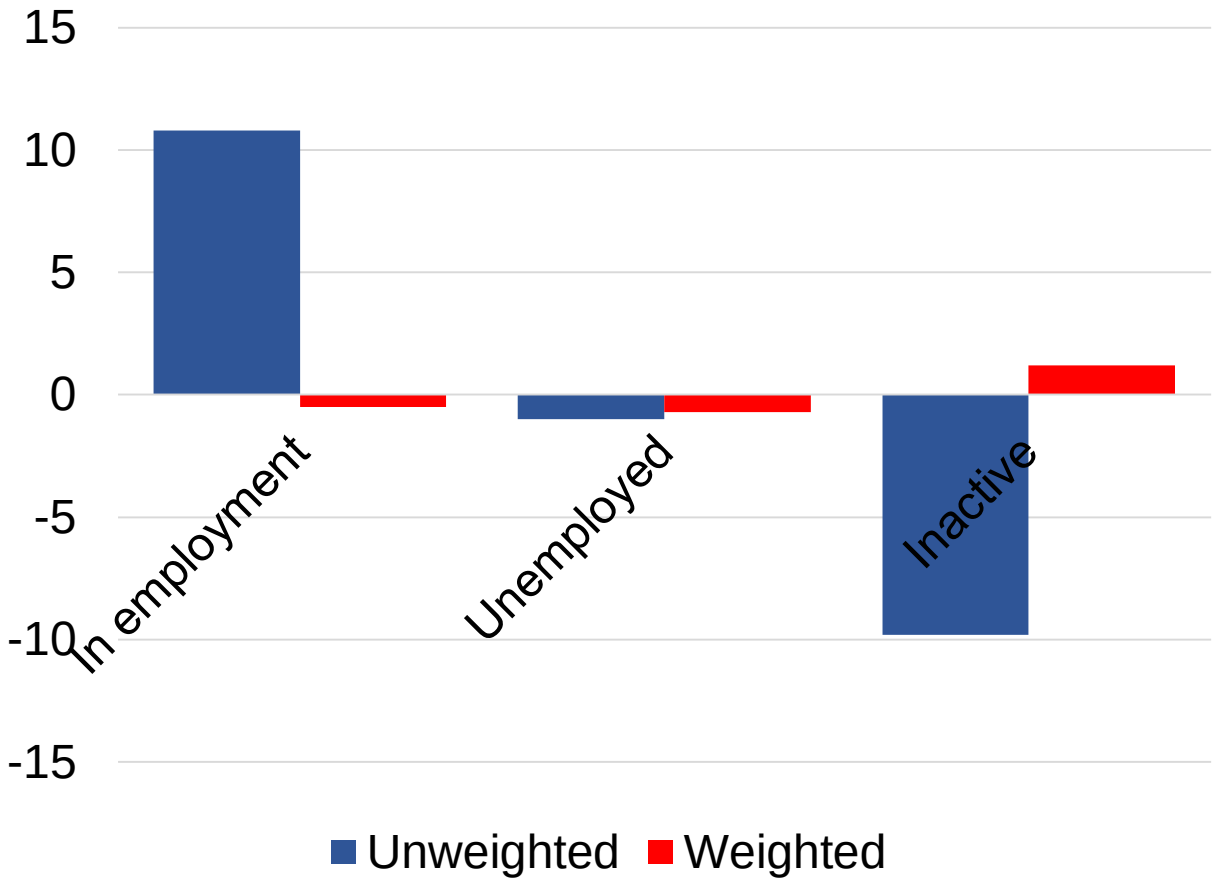
(ILC respondents vs general population – unweighted data)

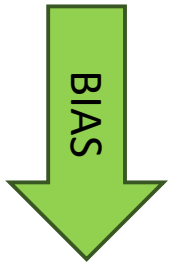


Note: p≤0.001 for all the variables, but the geographic area of residence (not statistically significant differences).

Results RQ2: Nonresponse at the recruitment stage

(unweighted vs weighted data)





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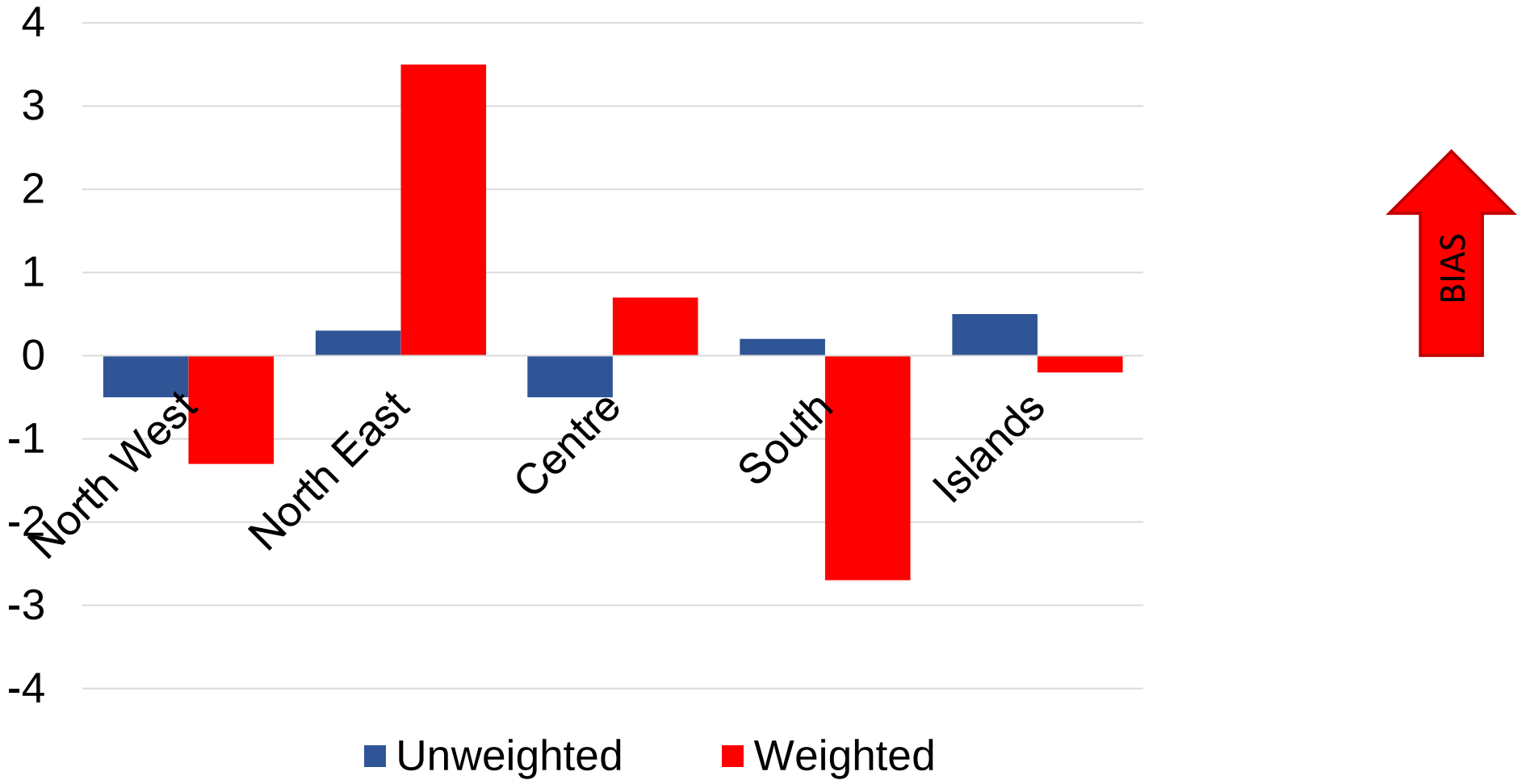

Results RQ2: Other accuracy metrics

	Internet coverage	Recruitment				Joining		Specific study	
Accuracy metrics	Internet population vs general population	ILC respondents vs Internet population		ILC respondents vs general population		Panelists vs Internet population	Panelists vs general population	ILC respondents vs selected panelists	ILC respondents vs panel members
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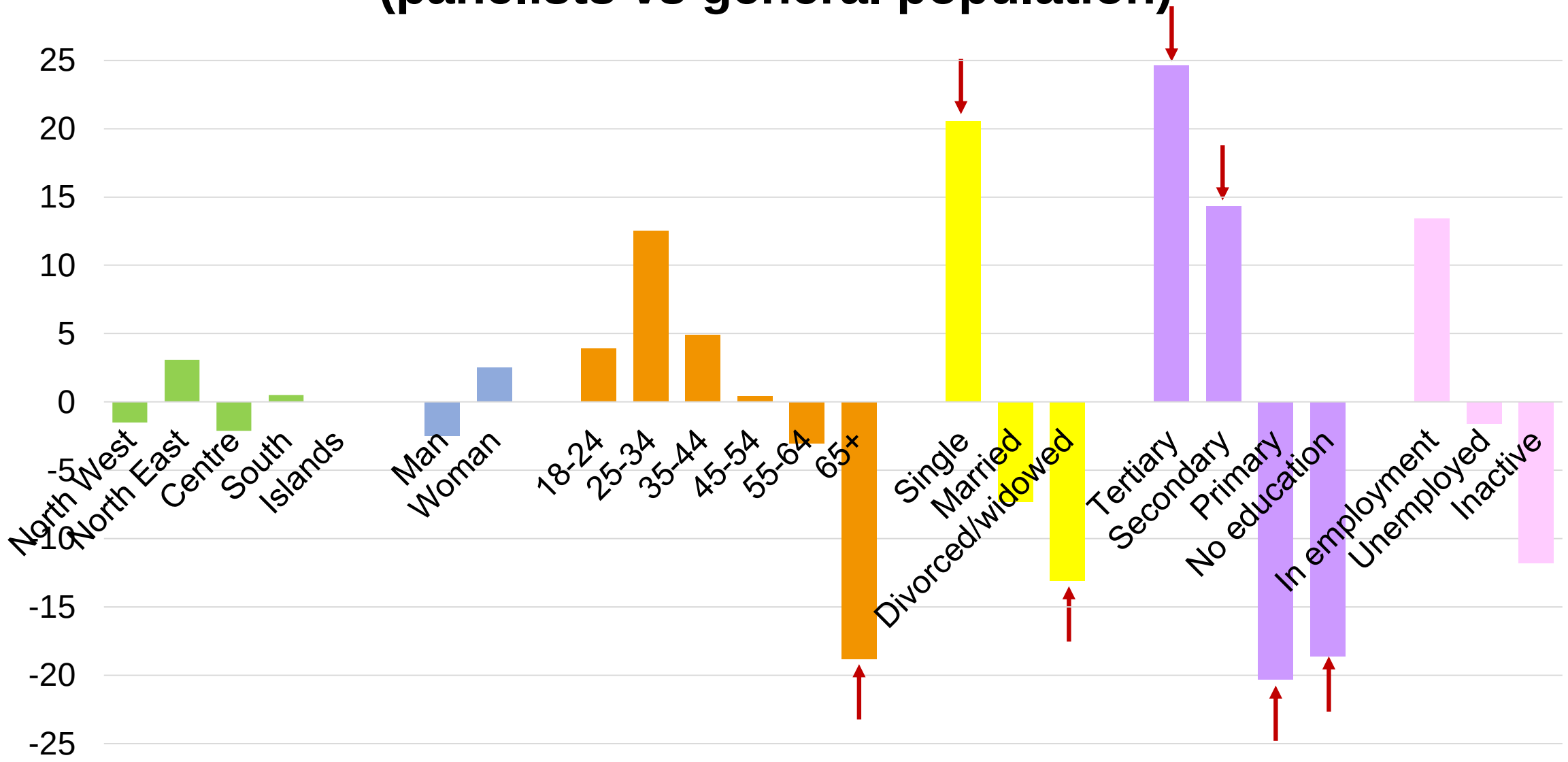
10 percentage points	2	3	0	6	0	2	7	0	0
15 percentage points	4	0	0	4	0	0	3	0	0

Results RQ3: Nonresponse at the joining stage

(panelists vs general population)



Note: p≤0.001 for all the variables.

Results RQ3: Other accuracy metrics

	Internet coverage	Recruitment				Joining		Specific study	
Accuracy metrics	Internet population vs general population	ILC respondents vs Internet population		ILC respondents vs general population		Panelists vs Internet population	Panelists vs general population	ILC respondents vs selected panelists	ILC respondents vs panel members
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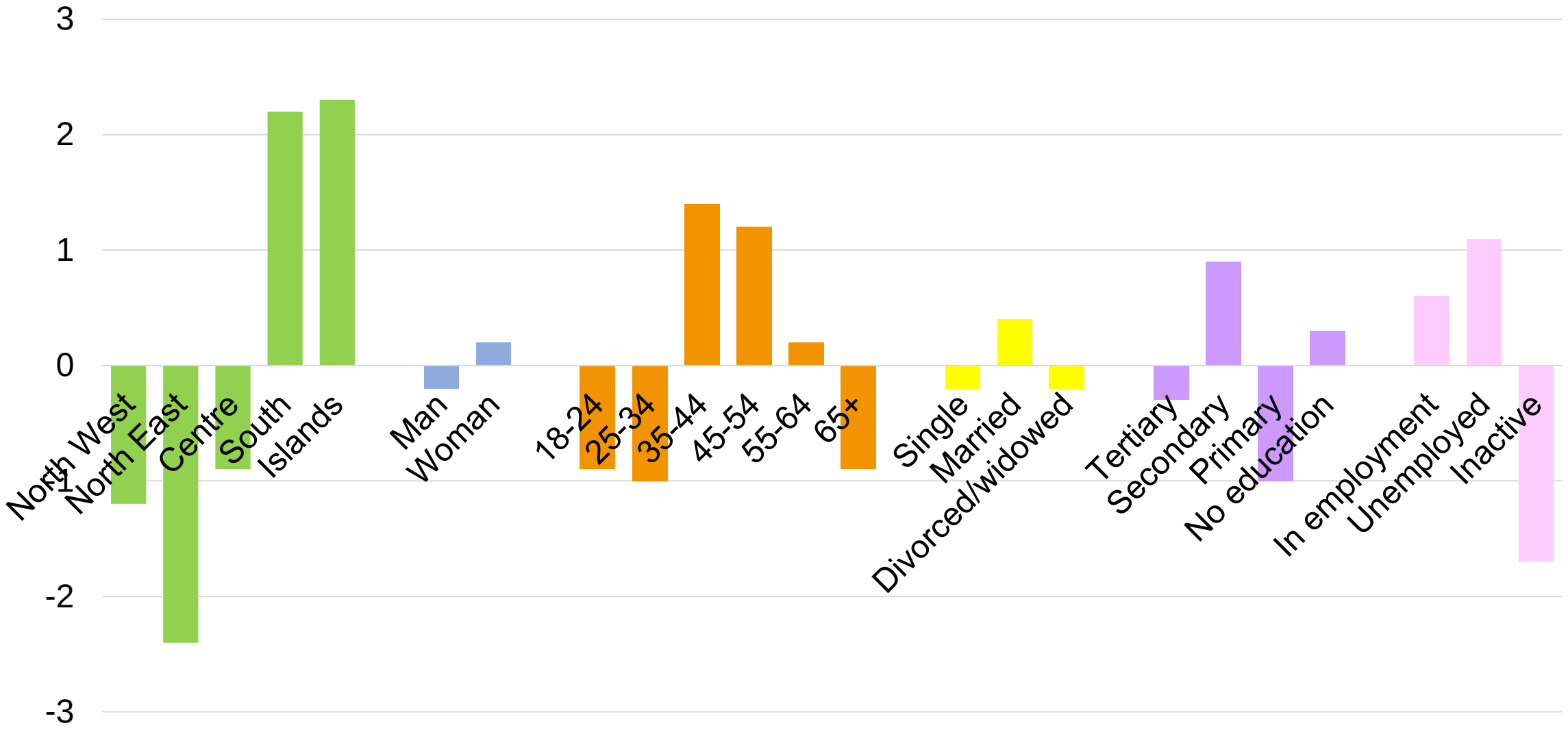
5 percentage points	6	2	4	4	3	6	1	0	3
10 percentage points	2	3	0	6	0	2	7	0	0
15 percentage points	4	0	0	4	0	0	3	0	0

Results RQ4: Nonresponse at the specific study stage

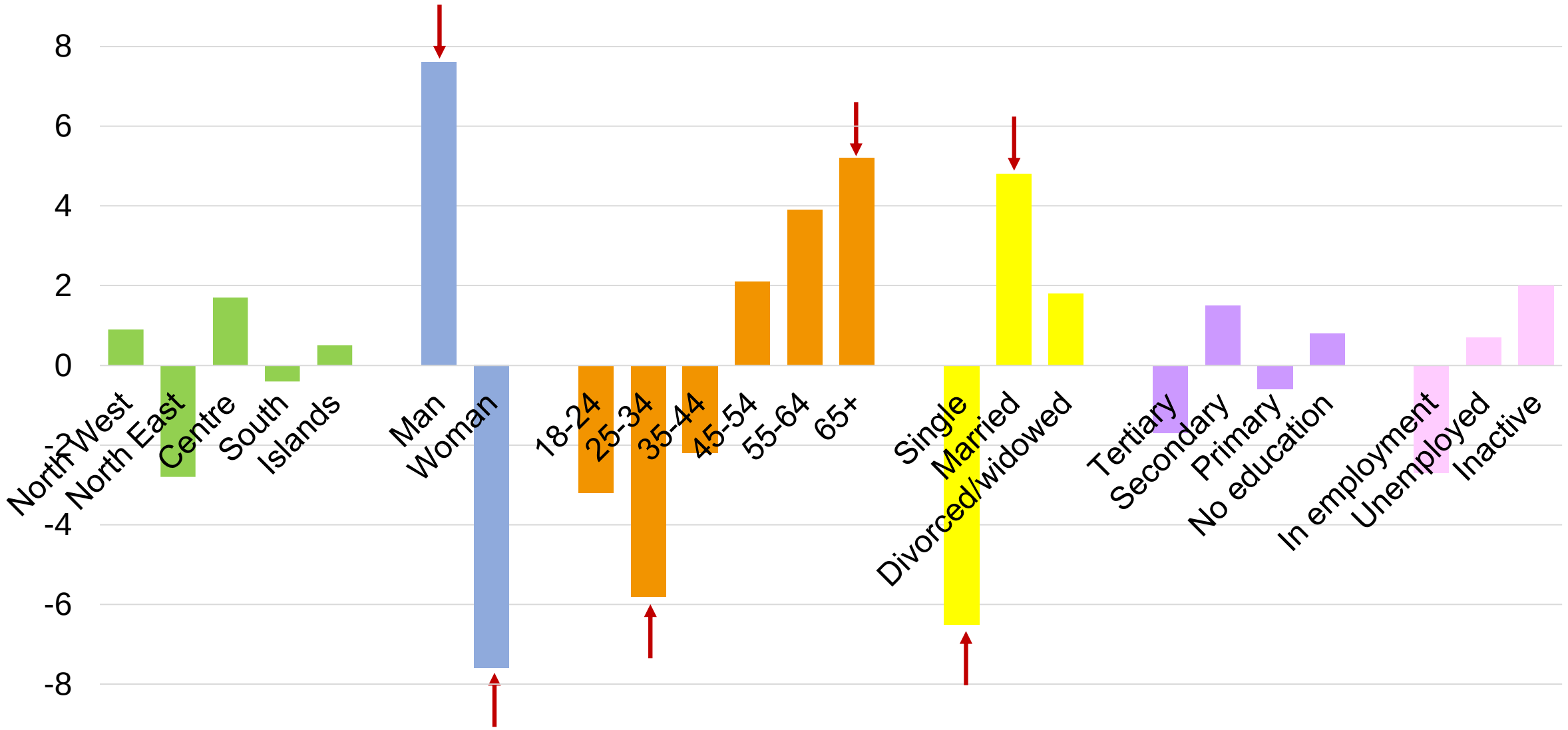
(ILC respondents vs eligible sample members)



Note: all the differences are not statistically significant, but the geographic area (p≤0.005).

Results RQ4: Nonresponse at the specific study stage

(ILC respondents vs panel members)



Note: p≤0.001 for sex, age, marital status, and education; p≤0.010 for geographic area; not sign. for occupation.

Results RQ4: Other accuracy metrics

	Internet coverage	Recruitment				Joining		Specific study	
Accuracy metrics	Internet population vs general population	ILC respondents vs Internet population		ILC respondents vs general population		Panelists vs Internet population	Panelists vs general population	ILC respondents vs selected panelists	ILC respondents vs panel members
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Conclusions

Internet coverage

- The Internet population is **not** representative of the general population ⚠

Nonresponse at the recruitment stage

- ILC respondents are **not** representative of the Internet population and are **not** representative of the general population ⚠
  BUT
  after weighting, some of the bias is removed ☺

Nonresponse at the joining stage

- The panel *Opinione.net* is **not** a representative sample of the Internet population and does **not** represent the general population ⚠

Nonresponse at the specific study stage

- ILC respondents are **not** representative of the panel ⚠
  BUT
  they are representative of eligible sample members ☺

Implications

Careful when using data from the *Opinione.net* non-probability online panel

Discussion
Issue 1: Focus/structure of the paper

Reviewer 1	**Our proposal**
Drop the part on undercoverage and focus on nonresponse only	
Drop the comparison with the Internet population and focus on the comparison with the general population only	
AAPOR framework inappropriate	

Discussion
Issue 1: Focus/structure of the paper

Reviewer 1	**Our proposal**
Drop the part on undercoverage and focus on nonresponse only	Focus on nonresponse occurring at the joining and the specific study stages of the life of the non-probability online panel
Drop the comparison with the Internet population and focus on the comparison with the general population only	Keep the comparison with the Internet population
AAPOR framework inappropriate	Not mention AAPOR framework

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Issue 2: Definition of the Internet population

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Provide a validation of this new conceptualization or use the conventional operativisation of the Internet population (e.g., “does someone have access to the Internet?”)	

You?

Discussion
Issue 2: Definition of the Internet population

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You?

Restructuring the paper…

	Internet coverage	Recruitment	3 Specific study		1 Joining		2 Specific study	
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Suggestions are welcome!

Thank you!

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