

Optimal Recruitment Strategy for a Probability-Based Web Panel: Cost and Error Integration

Andreja Praček, Vasja Vehovar, Gregor Čehovin, Kaja Forte

University of Ljubljana, Faculty of Social Sciences

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Problem and Objective

- **Recruitment strategies** are often designed based on a single criterion, such as bias of estimates or response rates.
- For a cost-effective survey design, an approach that **integrates all the main aspects of both survey errors and costs is needed.**
- **Objective:** To identify the recruitment strategy for a probability-based web panel that yields the optimal balance between costs and survey errors.
- This study **experiments with different incentive strategies**, including a €5 unconditional incentive and a €10 conditional incentive.

About the 1KA Panel

- Experiments were conducted within **the 1KA panel**.
- **First probability-based web panel in Slovenia.**
- Launched in **2022** at the Centre for Social Informatics, University of Ljubljana.
- Recruitment from the **central population register**.
- **Eight panel waves** conducted so far.
- Currently **3,400 panelists**, all adult residents of Slovenia.

About the 1KA Panel (2)

- **Push-to-web surveys**, web-only mode.
- **Incentives for confirmed panelists**: €5 unconditional gift card.
- **Recruitment**: Postal mail invitation plus two reminders.
- **Panelists**: Postal mail invitation plus three email reminders.
- **Recruitment rates**: 30-40%, can surpass 50% for young participants.
- **Response rates**:
 - Invited panelists: 70-90%.
 - Overall: Around 17% after a year, 16% after two years.

Methodological Experiment

- **Second recruitment wave (Wave 5) – June 2024.**
- **N = 7,000 experimental units.**
- **Eight experimental groups:**

Experimental Groups

Incentive Groups	N	Response	Response Rate	Variable Costs per Respondent
No incentive	1,000	163	16%	€17
€5 dm – conditional	1,000	192	19%	€20
€10 dm – conditional	1,000	253	25%	€22
€5 dm – unconditional	1,000	373	37%	€22
€5 dm – unconditional + €5 dm – conditional	1,000	408	41%	€26
€5 dm – unconditional + €10 dm – conditional	1,000	445	45%	€29
€10 dm – unconditional	500	225	45%	€29
€10 Mercator – unconditional	500	204	41%	€33
Total	7,000	2,263	32%	€19

Costs per Unit of Accuracy

Optimizing the product of survey costs and survey errors:
minimal costs per unit of accuracy (CUA):

➤ **$CUA = TC \times MSE(\bar{y})$**

- Total costs: $TC = \text{Fixed costs} + \text{Variable costs}$
- Accuracy: $MSE(\bar{y}) = \text{Var}(\bar{y}) + \text{Bias}^2(\bar{y})$
- Bias: $\text{Bias}(\bar{y}) = E(\bar{y}) - \bar{Y}$

Optimal Recruitment Strategy

- **1KA Panel estimates were compared to true population values:**
 - National official databases (statistical office and others),
 - Traditional probability surveys.
- **CUA calculated for 157 variables** across different topics.
- The "**winning group**" is determined by the **lowest average CUA rank** considering topic CUA rank averages.

Results – CUA Rankings by Topic and Overall

Topic	€5 UNC	No Incentive	€5 UNC & €5 COND	€10 COND	€10 Mercator UNC	€5 UNC & €10 COND	€10 dm UNC	€5 COND
Work and Employment	2	3	1	4	8	7	6	5
Demographics	4	2	7	1	5	6	2	8
Digital Certificate	1	3	2	3	7	8	6	5
Unweighted Demographics	1	6	4	2	8	4	7	3
Migrations	5	3	1	3	1	5	5	5
Elections & Referendums 24	6	5	7	8	3	1	3	2
Health	6	4	3	5	2	1	7	8
Internet Usage and Access	1	2	6	7	4	3	5	8
Internet – Activities, Video Content and Education	2	4	1	5	8	3	6	7
Mobile Phone	3	2	1	5	8	4	6	6
Smart Devices	1	2	5	3	7	8	6	4
Artificial Intelligence	4	6	3	7	5	2	8	1
Neighborhood Safety	1	2	6	3	5	8	4	7
Well-being	1	3	5	4	7	8	2	6
Total – Average CUA Rank	3.8	3.9	4.1	4.3	4.7	4.9	5.1	5.2
Total – Group Ranking	1	2	3	4	5	6	7	8
Variable Costs per Resp.	€22	€17	€26	€22	€33	€29	€29	€20
Response Rate	37%	16%	41%	25%	41%	45%	45%	19%

UNC –
unconditional
COND –
conditional

Discussion

- **The best recruitment strategy** with the lowest average CUA rank considering topic CUA rank averages is the **unconditional €5 gift card** incentive, followed by the **no incentive** group.
- The **integrated cost-error criteria (CUA)** results **differ considerably from partial criteria** results:
 - Cost per respondent: the winner is the *no incentive* group.
 - Response rates: the winners are *€5 dm unconditional + €10 dm conditional*, and *€10 dm unconditional*.
 - Accuracy: the winner is *€5 dm unconditional + €5 dm conditional*.

Discussion (2)

- **Considering the averages of all the variables** (ignoring the topics), the winner is again the **€5 unconditional** gift card, followed by the **no incentive group**.
- **A preliminary experiment from 2022** (first recruitment wave, N = 2,200, 90 variables): **similar results** with same winning group by topics – €5 unconditional.
- The **differences** between the total average ranks among groups are **not high**.
- The results largely **depend on the topic**.
- **The winning strategy** by topic also has **most wins across topics**.

Limitations and Application

- Although the CUA includes all the essential elements needed to select the optimal strategy based on costs and errors, **decision-makers may consider the following partial factors**, either in addition to or independently of the CUA:
 - Response rate and achieved sample size (number of respondents),
 - Precision and accuracy,
 - Costs (overall or per respondent).
- Our approach is particularly useful for projects with a small budget.
- This approach can also help determine the optimal number of follow-up contacts.

Thank You!

Questions and Discussion

For more information on the 1KA Panel, visit panel.1ka.si.

You can also contact me at: andreja.pracek@fdv.uni-lj.si.