Experience with Tailored Designs at Statistics Austria

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Linz, 4 September 2025

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Person and Household Surveys – Status

- Many (big) surveys are conducted by Statistics Austria, e.g.,
  - Microcensus (~4500 CAPI households per quarter)
  - Housebold budget survey
  - Health survey
  - EU-SILC – Survey Income Living Condition
  - …
- Our survey infrastructure (STATsurv) allows multi-mode surveys
  - CAPI – Computer-assisted personal interviewing
  - CATI – Computer-assisted telephone interviewing
  - CAWI – Computer-assisted web interviewing
- About 200 specialised interviewers for CAPI interviewing -> **limited capacity** for CAPI interviews
- Inhouse telephone survey center

Person and Household Surveys – Motivation

- Classical approach „CAWI/CAPI-first“ or a random assignment of the mode

- CAPI : gold standard for the quality of response and response rates , but expensive and capacity is not enough for all surveys
- CAWI : cheaper, but quality is suspected to be lower!?

- There must be some persons/households who **prefer to respond via CAWI** over CAPI?

- Use the CAPI capacity for a specific survey in an “optimal” way

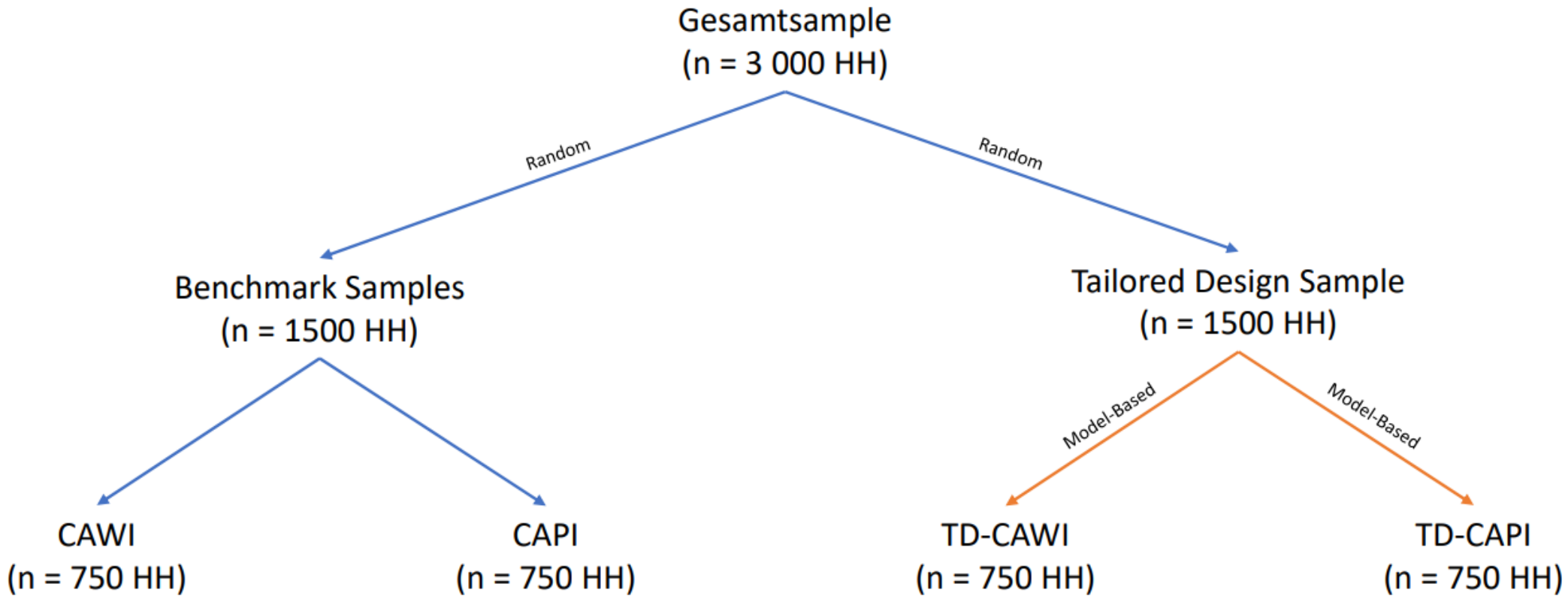
Tailored Design – Key Principles -> Tailored Mode Design

- **Mixed-mode integration** – combine survey modes to improve coverage and representation
- **Respondent-centred approach** – design surveys to match the needs, preferences, and context of the target population
- **Maximise response rates** – through multiple personalised contacts, incentives, and clear communication
- **Reduce measurement error** – ensure clear, concise questions and logical flow to improve data quality
- **Optimise visual, mode-specific customization**, **sequential contact strategy, continuous improvement**

- We will only look at **mode assignment, different (expected) response rates** and **models for the response behaviour**

- **Developed since the 70s, especially by Don Dillman**

First experiment – Austrian socio-economic panel Pilot 23



Requirements for applying tailored mode design

- Estimation of a response probability for CAWI and CAPI for each household in the sample,
- but most surveys are already
  - mixed mode or
  - target persons not households
  - Many (important) characteristics are on household level, e.g., income, education, employment status, …

- We used data from a ~1 year old household survey for the CAPI model
- Survey of person for CAWI model

We know a lot about our gross sample from the sampling frame

- Richframe: Regularly updated sampling frame with a rich collection of information about the sampling units.
- Available information:
  - Age, gender, citizenship, ...
  - Family, Household size, type, …
  - Regional information: grid location, degree of urbanization…
  - Education, Employment status, Income

Logistic regression models on person level

Explanatory variables for both models:

- Self-employed
- Equivalised household income (tax data)
- Model-based “SILC-like” income
- Age
- Education
- Country of Origin
- Household size
- Employment status

Logistic regression models on person level

Additional variables for CAWI:

- Gender
- Unemployed last 12 months

Additional variables for CAPI:

- Degree of urbanization (3 levels)
- Number of second residences

Not useful:

- Federal state
- More detailed urban/rural typologies
- Single parent
- Household with 3+ children
- Building characteristics (Age, size…)
- Available internet connections and speed

Application of the Tailored Mode Design

- Household probability = minimum of response probability per household
- Ratio of CAWI probability and CAPI probability
  - About 30% have a higher probability to respond by CAWI
  - Median of the ratio is 0.83 in the population
- 50% with the highest value -> CAWI
- 50% with the highest value -> CAPI

Results of the first experiment ASEP23

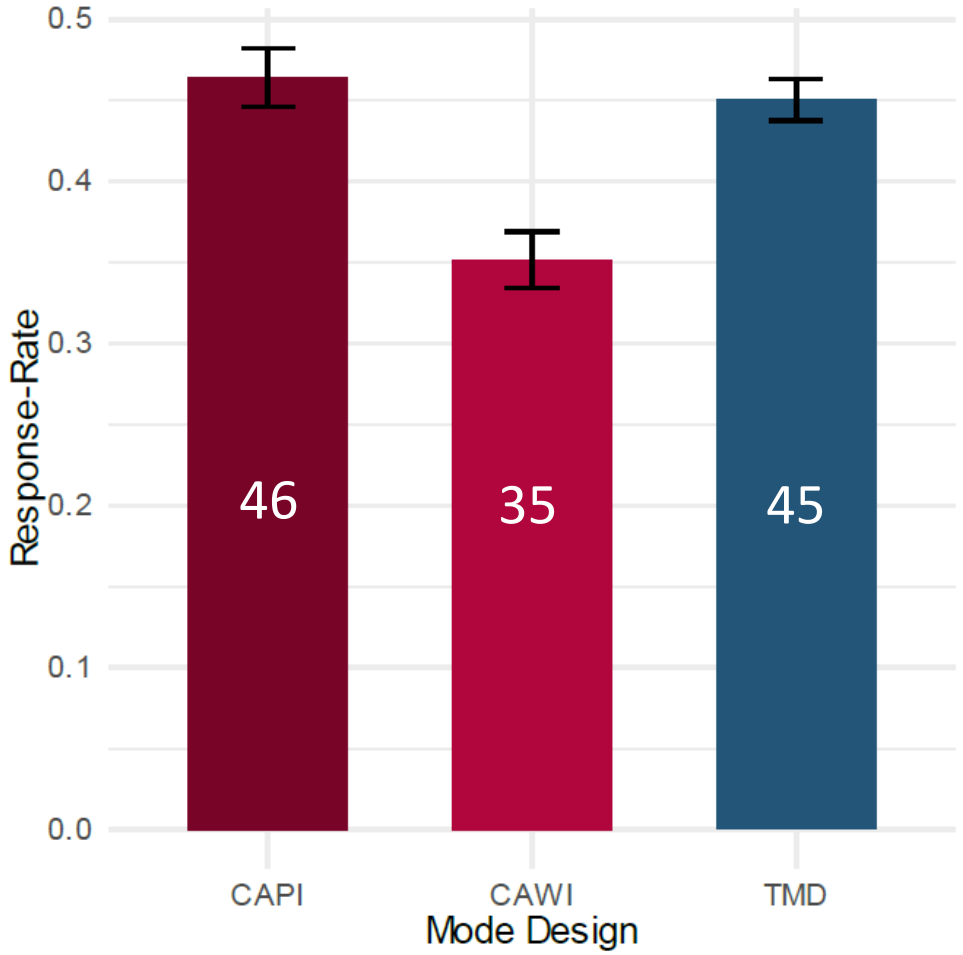


Figure 1: Response-Rates of the Three Mode Designs (95% Confidence Intervals)

Results of the first experiment ASEP23

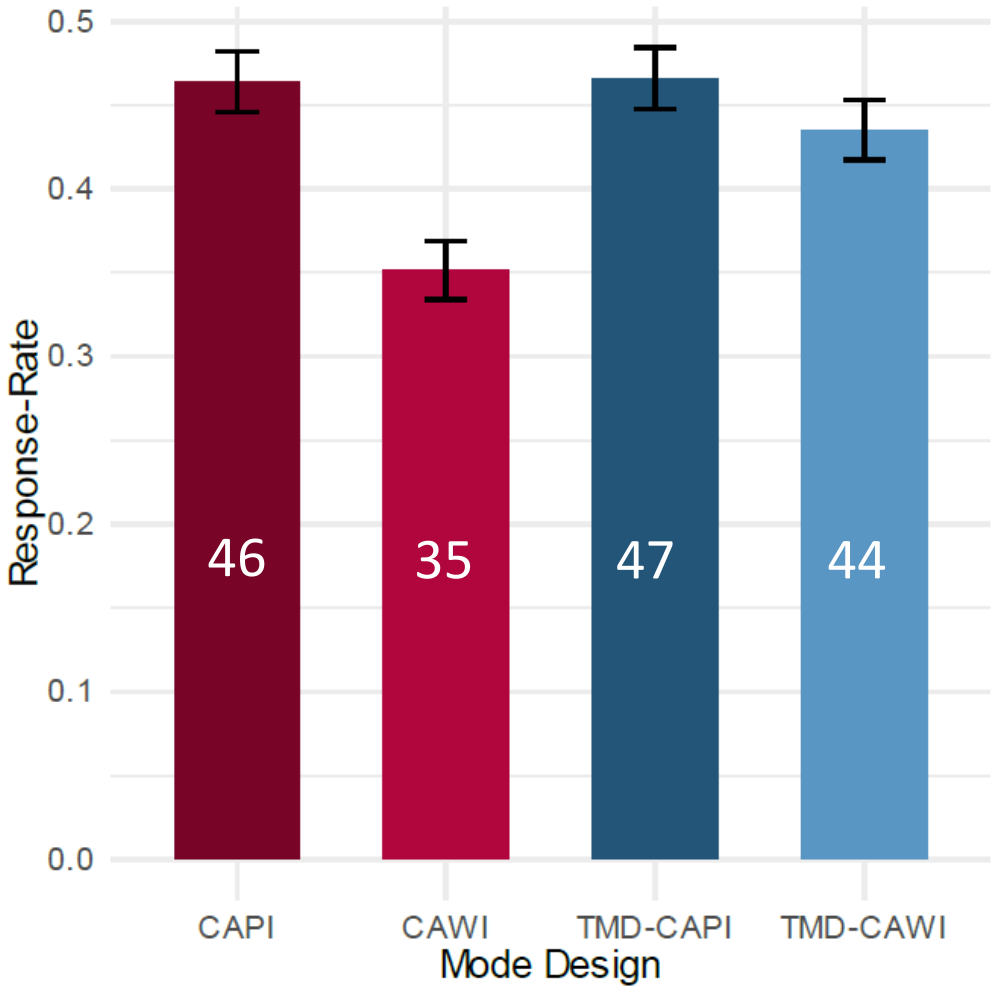


Figure 2: Response-Rates of the Three Mode Designs with Mode-Specific Response-Rates for the TMD Mode Designs (95% Confidence Intervals)

After the first experiment

- New, better input data
  - Random mode part from ASEP23 pilot
- No significant improvement by different setups:
  - We tested different ways to aggregate to a household
    - Mean probability
    - Probability of the person that the mailing is addressed to
    - Modelling probabilities directly on a household level
  - We tested different models:
    - Random forest
    - Xgboost
    - Neural net
- Application of the TMD to 2 surveys that are currently in the field
- Application of the TMD to the first wave of the Austrian socio-economic panel

Updated model -> planning input for new surveys

Share CAWI	Share CAPI	Response CAWI	Response CAPI	Estimated Response
100%	0%	37%		37%
90%	10%	40%	48%	41%
80%	20%	44%	50%	45%
70%	30%	47%	50%	48%
60%	40%	50%	50%	50%
50%	50%	54%	50%	52%
40%	60%	57%	50%	53%
30%	70%	59%	50%	53%
20%	80%	61%	51%	53%
10%	90%	62%	50%	51%
0%	100%		49%	49%

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