SURVEY FUTURES

SURVEY DATA COLLECTION METHODS COLLABORATION

RS7: Data Integration

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What is Data Integration?

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Data integration refers to the process of **bringing together information from multiple data sources in a coherent and consistent manner.**

- Data integration makes it possible to examine relationships between factors which might not be visible from any one data source alone.

Research strand 7 of Survey Futures is concerned with how non-survey data can be used to enhance survey data.

What are our Research Themes?

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Practitioner Guide 1

Options for integrating non-survey and population survey data.

Practitioner Guide 2

Using integrated non-survey data for evaluating and correcting non-response bias in surveys.

Practitioner Guide 3

Using integrated non-survey data for monitoring and intervening in survey data collection.

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Accessing our work so far

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Practitioner guides: surveyfutures.net/practice-guides/

- Survey Practice Guide 1: Data Integration
- Survey Practice Guide 5: Using integrated non-survey data for evaluating and correcting for non-response
- *Using integrated non-survey data for monitoring and intervening in survey data collection*

Events:

- youtube.com/watch?v=Awjag8x4GiY
- youtube.com/watch?v=VxSC_obOO88
- youtu.be/8Z_g-nb-XG0

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What's New in Data Integration?

A Scoping Review and Reporting Framework

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Research Questions

Which survey and non-survey data sources are commonly integrated?

Which methods are most frequently used to link survey and non-survey data?

For what research purposes are integrated survey and non-survey data used?

What is the quality of reporting for data integration?

Methods

We conducted a PRISMA Scoping review (Tricco, 2018)

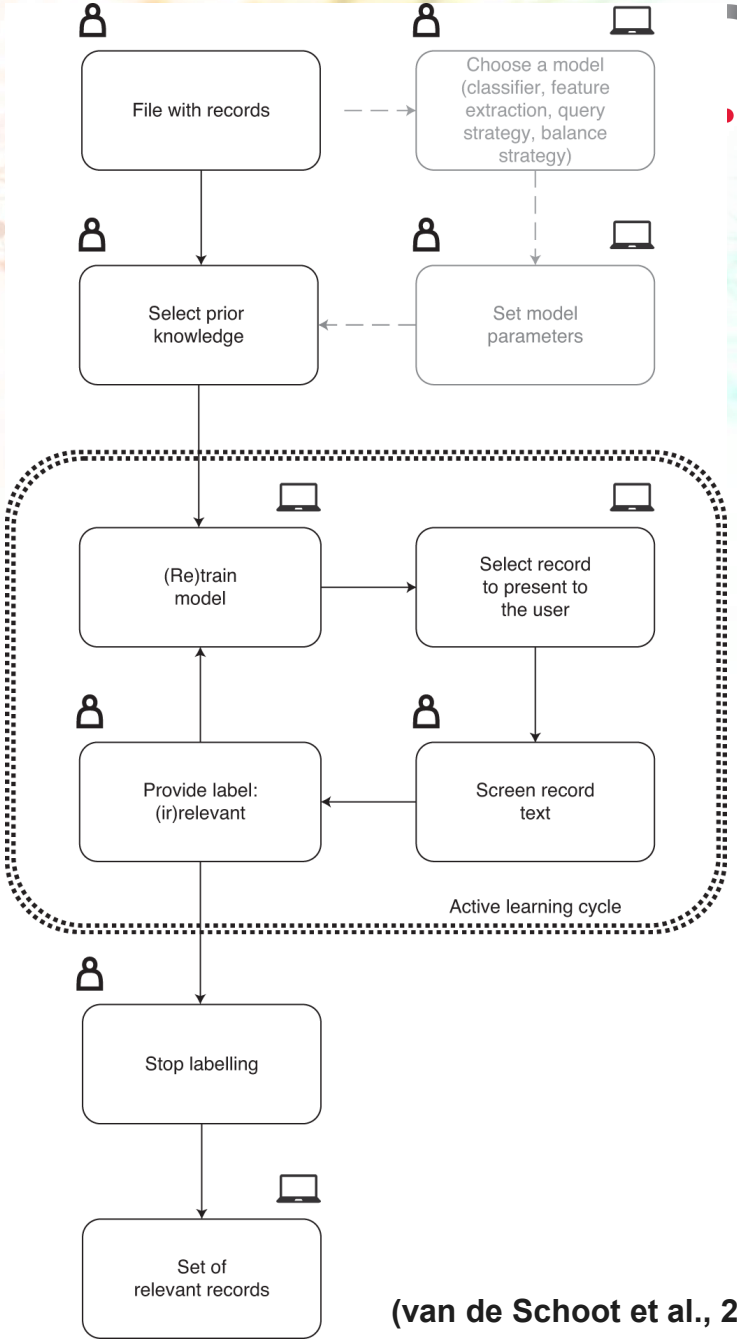
- Ovid (including the Cochrane Library, APAPsycInfo, Embase, Econlit and Medline)
- Web of Science (Core Collection)
- Scopus

Final searches conducted 16/05/2025

- *Screening was calibrated across two coders*

Active learning model (ASReview; van de Schoot et al., 2021)

- *Utrecht University's AI Lab "AI-aided Knowledge Discovery".*



(van de Schoot et al., 2021)

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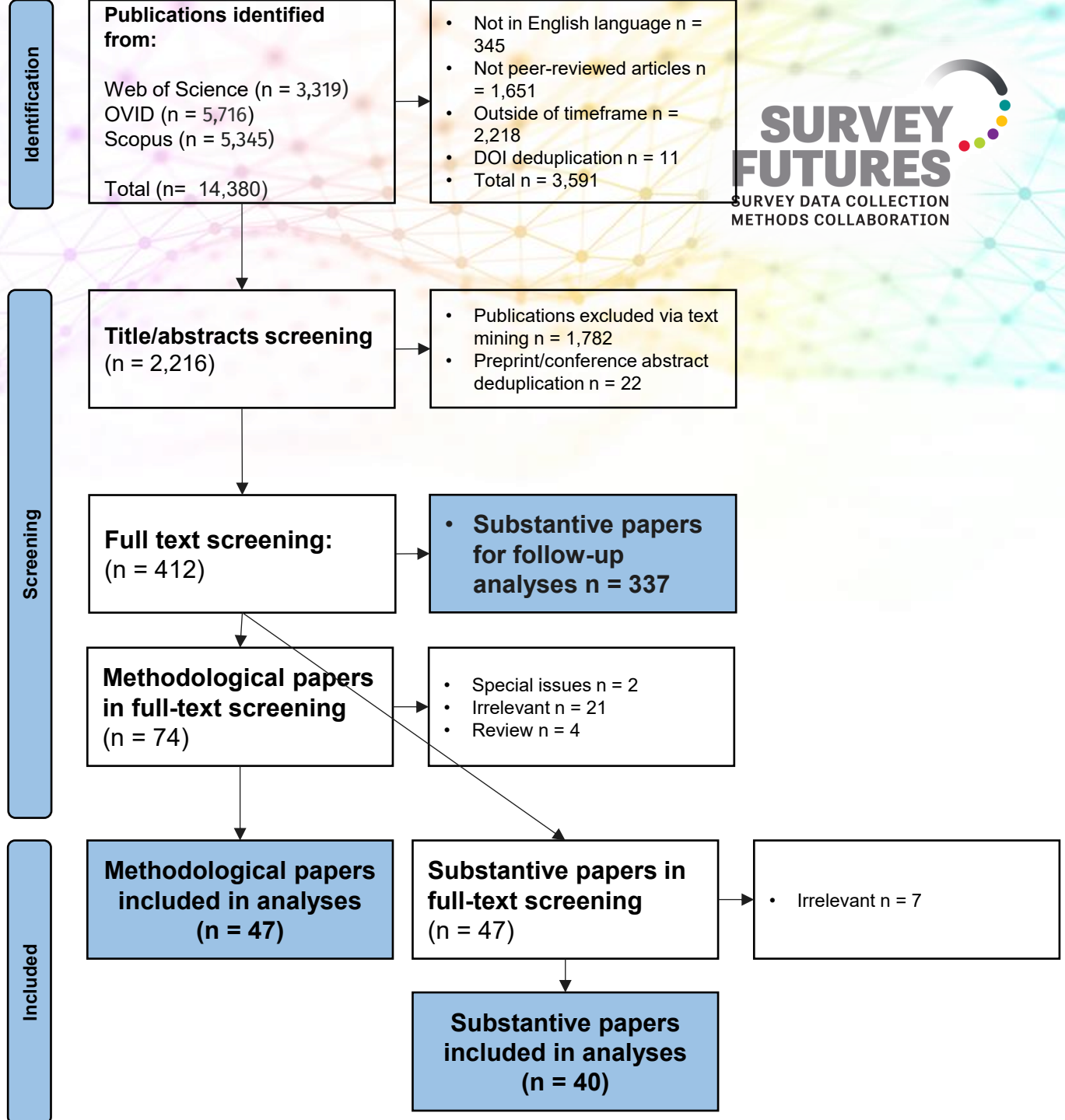
The PRISMA Diagram



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RQ1: Which survey and non-survey data sources are commonly integrated in methods literature?

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	Administrative records	Smart tracker app	Place-based characteristics	Sensor data	Commercial data	Social media data	Total
Panel study	18	4	1		2	1	26
Birth cohort study	3						3
Repeated cross-sectional	13		1	2			16
Cross-sectional	2		1				3
Census	1						1
Total	**37**	**4**	**3**	**2**	**2**	**1**	49

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RQ1: Which survey and non-survey data sources are commonly integrated in substantive literature?

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	Administrative records	Smart tracker app	Place-based characteristics	Sensor data	Commercial data	Social media data	Total
Panel study							
Birth cohort study	22						22
Repeated cross-sectional	17	1	4				22
Cross-sectional	7				1		8
Census	28		1				29
Total	**74**	**1**	**5**		**1**		**81**

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RQ2: Which methods are most frequently used to link survey and non-survey data in methods literature in substantive literature?

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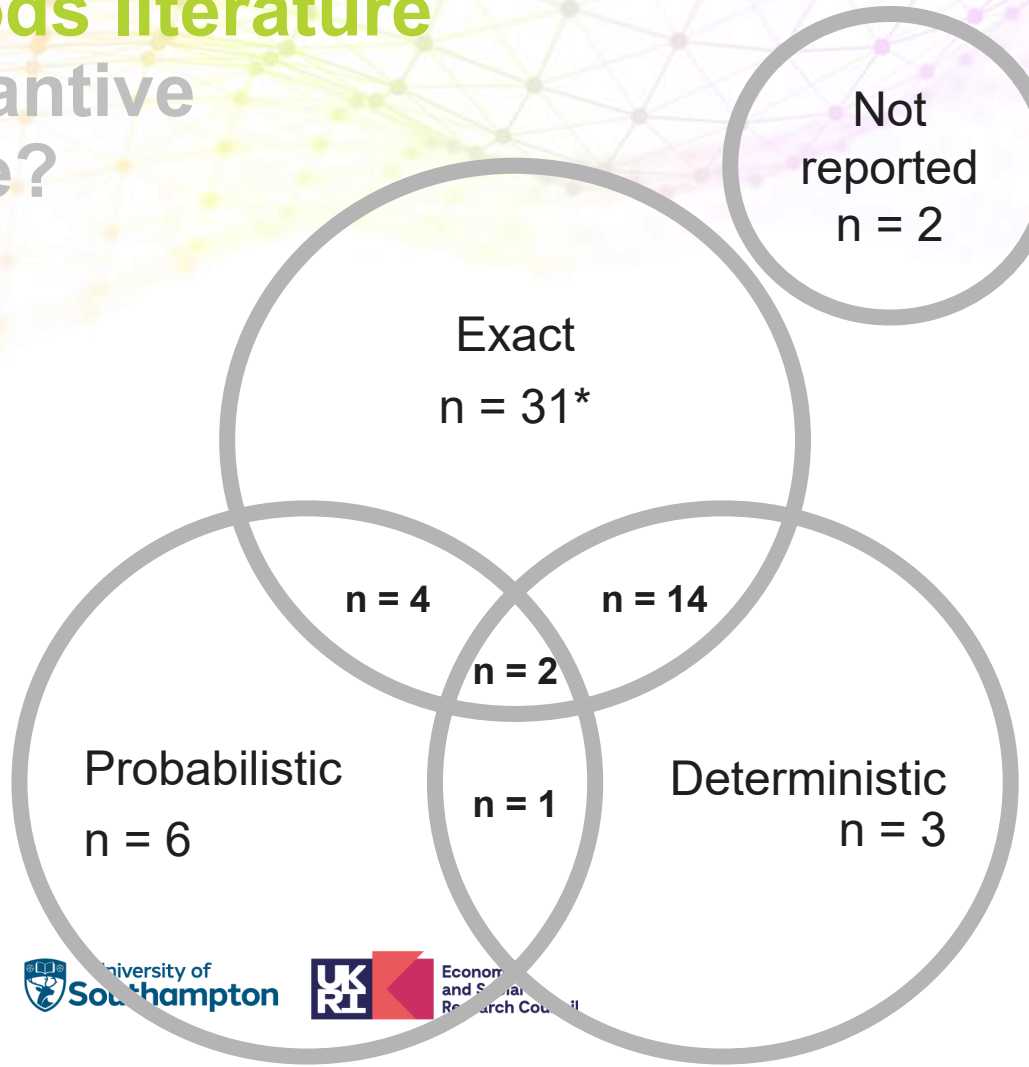

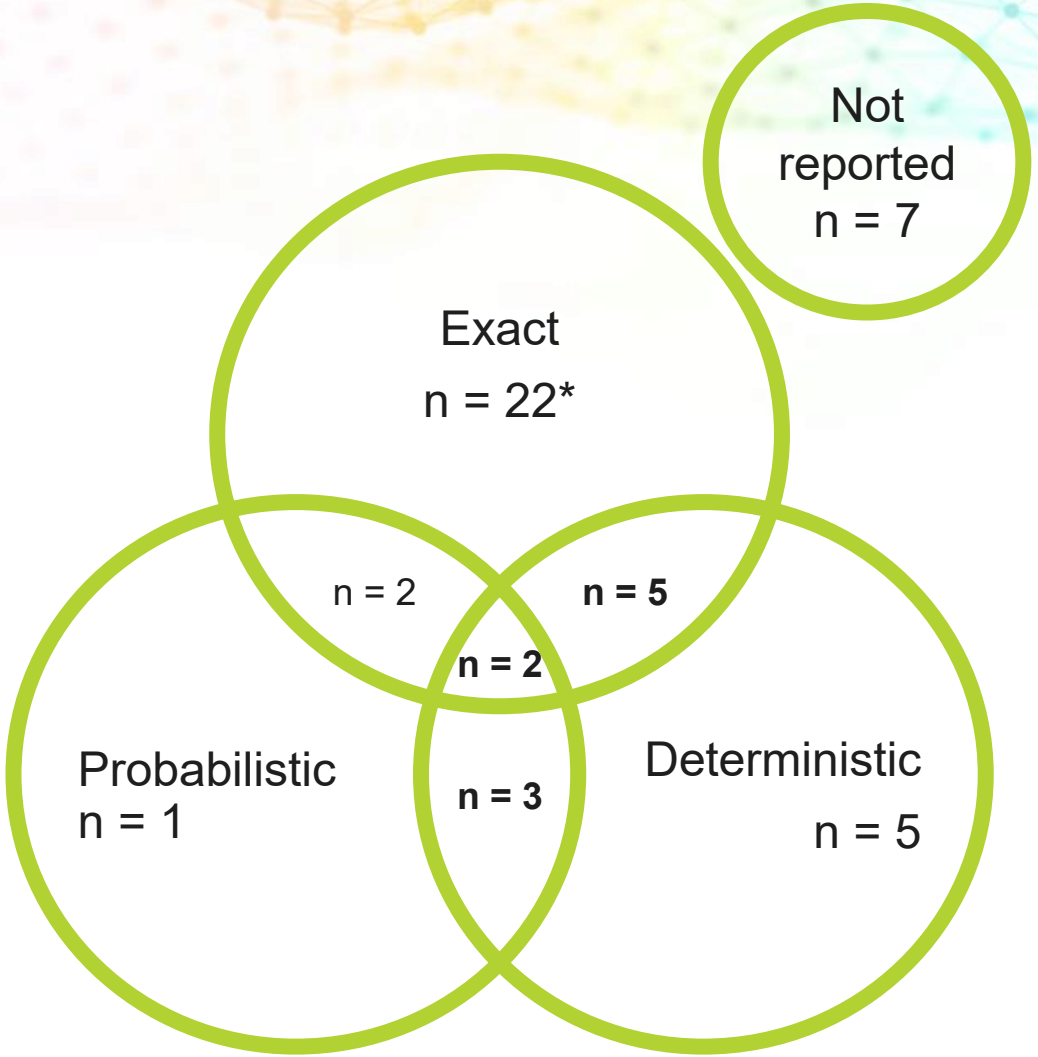

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RQ3: For what research purposes are integrated survey and non-survey data used?

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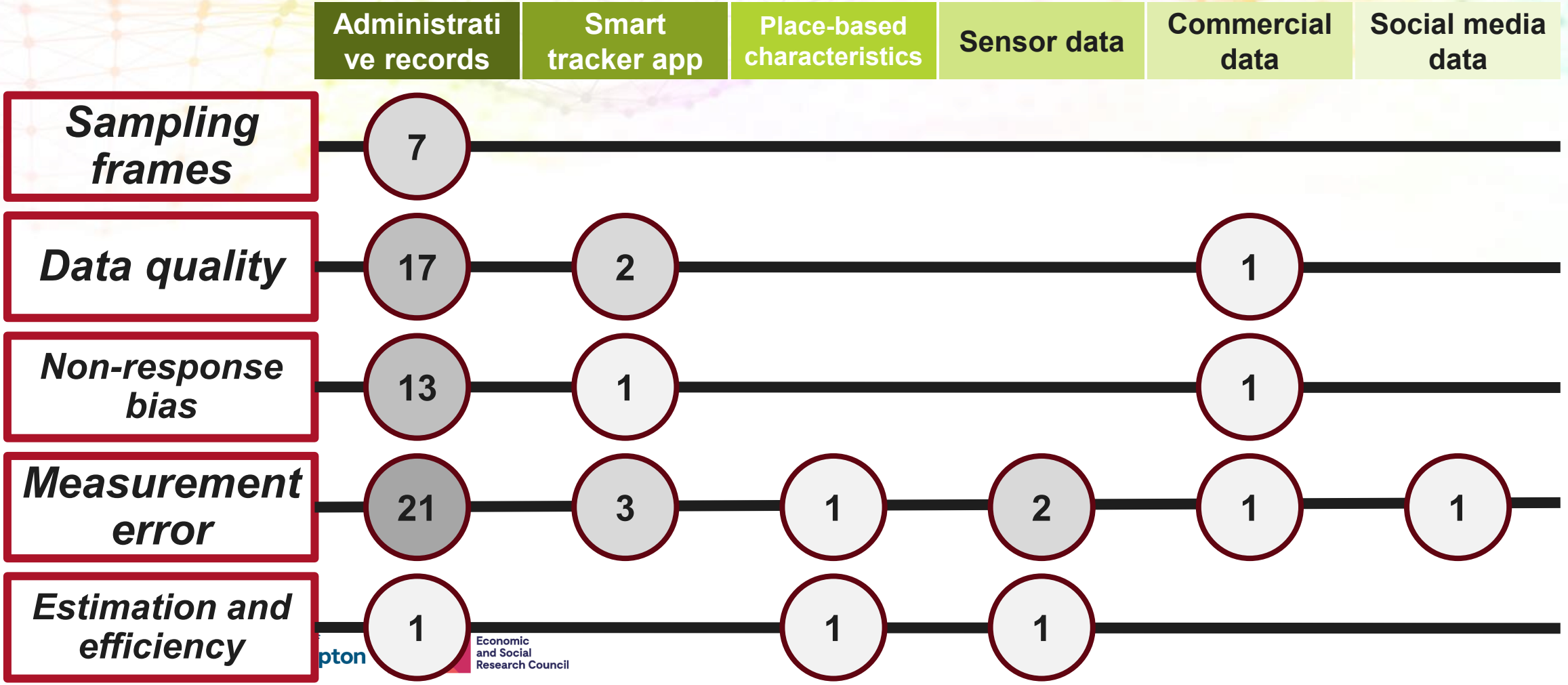

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RQ4: What is the quality of reporting for data integration?

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Linkage and consent details were difficult to find and were inconsistently reported.

40.4% Reported a response rate.

31.9% Reported a consent rate.

55.3% Mentioned consent to linkage.

46.8% Reported a linkage rate.

42.5% Mentioned whether consent was needed.

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Reporting guidelines for Integrated Data

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Survey data

(PRICSSA; Seidenberg, Moser & West, 2023)

Non-survey data

- Title
- Type
- Sub-type
- Timeframe
- Population
- Citation
- DOI

Integrated data information

- User guide/technical document
- Citation
- DOI

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Reporting guidelines for Integrated Data

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Integration procedure	Integration quality	Integrated data access
• Exact matching • Deterministic matching • Probabilistic matching • Statistical matching • Linkage units	• Linkage consent information • Linkage consent rate • Successful linkage rate • Corrections applied	• Access conditions • Access procedure

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Evaluating Data Quality in the Linked 1970 Birth Cohort Study

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Research Questions

What is the bias introduced by data linkage at each stage?

To what degree does this vary by domain/type of data?

Do differences in sample composition at each stage introduce bias to applied modelling?

Data and selection process

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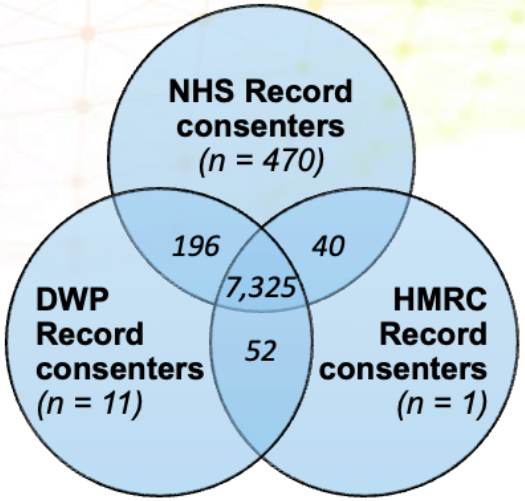

1970 Birth Cohort Study Age 42 (2012)
(n = 9,841)
(RR = 57%)

NHS Record Consenters
(n = 8,033)
(CR = 82%)

DWP Record Consenters
(n = 7,585)
(CR = 77%)

HMRC Record Consenters
(n = 7,419)
(CR = 75%)

HES records successfully linked Age 42 (2012)
(n = 6,099)
(LR = 62%)

SMR records successfully linked Age 42 (2012)
(n = 542)
(LR = 5%)

Non-consent
NHS
(No = 1,299)
(NA = 508)

DWP
(No = 1,746)
(NA = 509)

HMRC
(No = 1,912)
(NA = 509)

Non-linkage
HES
(No = 3,739)
(NA = 2)

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Predictors of consent

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The strongest predictor of consent was **prior non-response**

Renting was positively associated with consent, as was lower **educational** attainment (GCSE/O-level).

Former smoking status was also positively associated with consent

Several **geographic regions** showed significantly higher odds of consent, particularly the East Midlands, North East, North West, South East, South West, West Midlands, Wales, and Yorkshire & Humber

The same set of variables were found to be associated with almost all linkage types

Selection process by type of linkage

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Dataset	R Indicator	Coefficient of Variation	n
Age 42 Sweep	0.82	0.11	9705
NHS Consenters	0.84	0.10	7957
HES Linkages	0.83	0.10	6041
SMR Linkages	**0.77**	**0.14**	**541**
DWP Consenters	0.84	0.09	7514
HMRC Consenters	0.84	0.09	7352

Note: Response propensities were estimated via binomial logistic regression modelling (Next wave response, as predicted by previous non-response, NHS consent, DWP consent, HMRC consent, sex, Socio-economic classification, household size, house ownership or renting, country of birth, highest educational qualification, marital status, smoking status, economic activity, benefit receipt, general health and government office region.

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Does Additional Contact Information Improve Survey Outcomes?

Hafsteinn Birgir Einarsson, Kim Backström & Alexandru Cernat

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Research Questions

What is the impact of additional contact information on participation?

How does the composition of the sample change due to extra contact info?

Other ongoing research

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We investigate the effects of a **change in the Finnish Statistics Act** that granted Statistics Finland access to new contact information from the Finnish Social Insurance Institution.

The additional contact information included

- phone numbers and
- email addresses

We treat **the legislative change as a quasi-experimental design** to investigate how extra contact information affected **response rates and selection bias in the Finnish LFS**

We look at **new samples of ~600 persons randomly selected from the population register each week before and after the policy change** (148 weeks)

Overall participation outcomes

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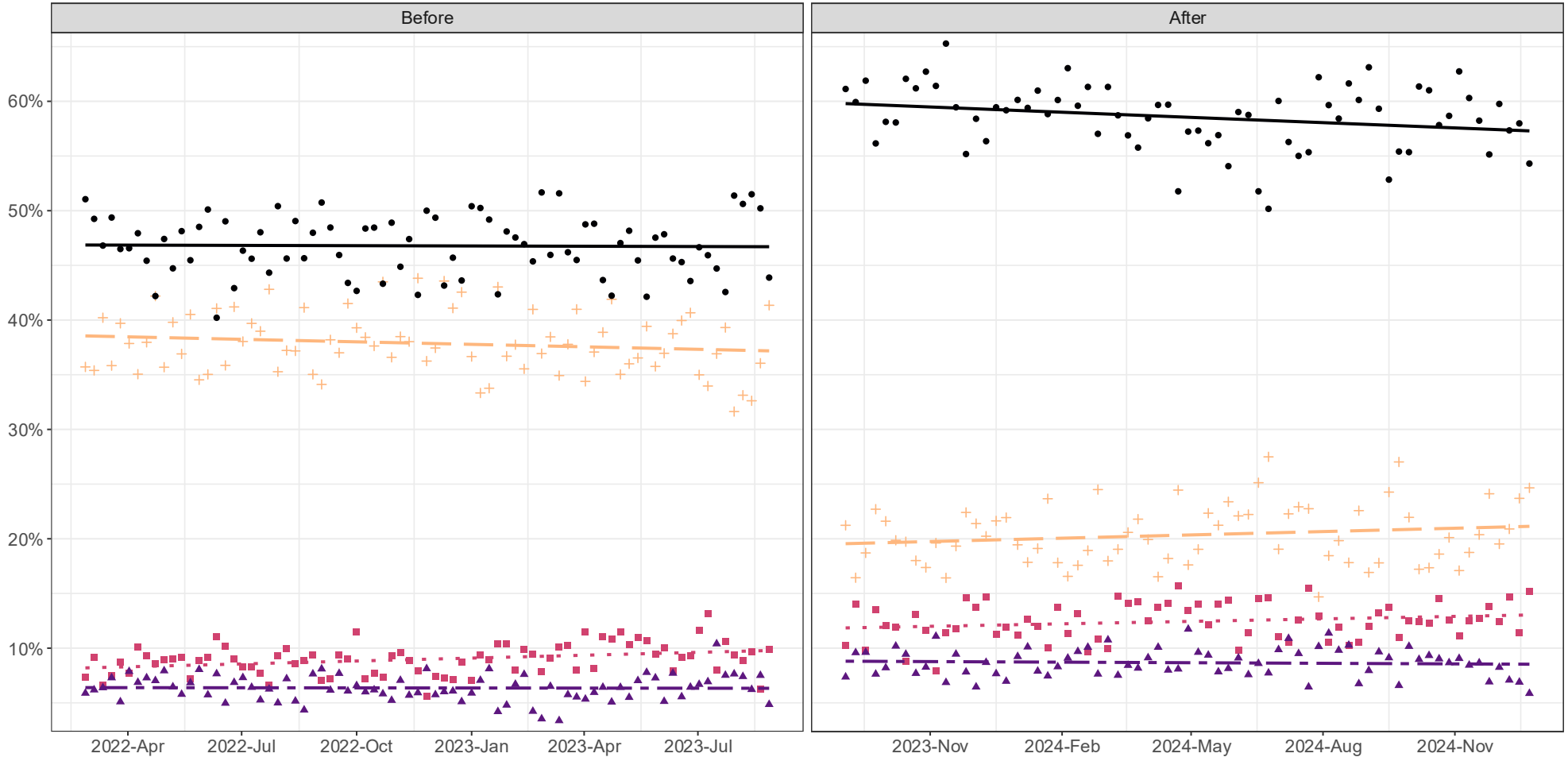

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R-Indicators measuring the representativeness of respondent compositions in FI-LFS

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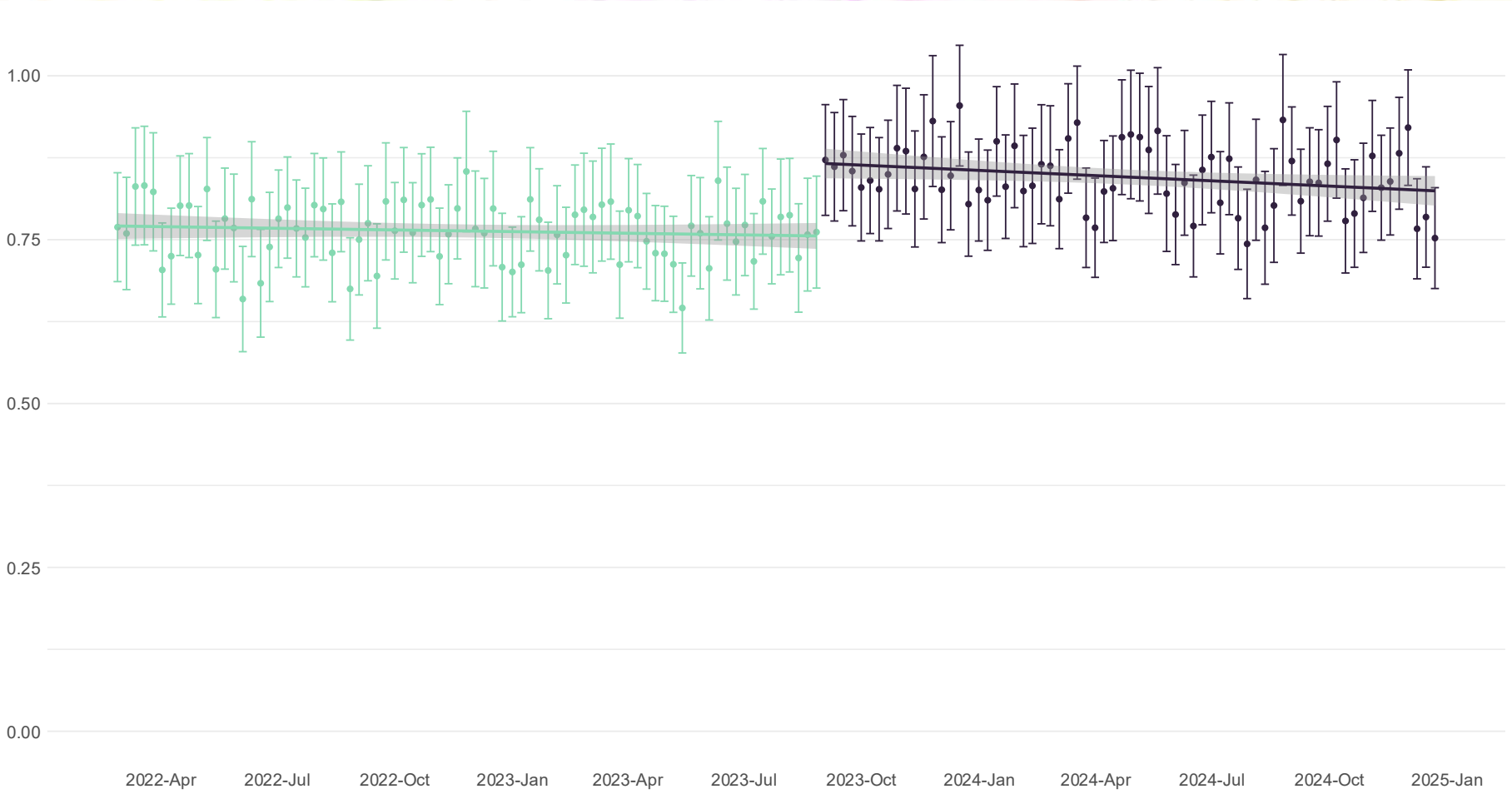

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Partial R indicators show inconsistent changes in selection process

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Other ongoing research

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Peter is leading a paper looking at how data at different levels (individuals, HHs, LSOA) predicts non-response in Understanding Society and how important it is to have up to date geographical data

Natalie is working on extending the classical Multi-Frame integration where both x_i and y_i are available in probability and nonprobability samples and same questionnaire applied to both samples

Nikos doing work around integrating survey and geospecial data

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What search terms were used?

Survey Data	AND	Non-Survey Data	AND	Data Integration
survey* OR "social survey*" OR "household survey*" OR "population representat*" OR population-based OR "nationally representat*" OR "random sampl*" OR "probability sampl*" OR questionnair* OR interview* OR "cross-sectional stud*" OR "longitudinal stud*" OR "cohort stud*"		administrative OR operational OR "routinely collect*" OR "electronic record*" OR geospatial OR geographic OR spatial OR "gridded population*" OR "geographic information system*" OR satellite OR commercial OR "smart app*" OR "digital trace*" OR web-tracking OR "data donation" OR census		"data link*" OR "data integrat*" OR "record link*" OR "probabilistic link*" OR "deterministic link*" OR "data merg*" OR "data fus*" OR datalink* OR "multiple dataset*" OR "multiple data source*" OR "linkage stud*" OR "adaptive survey design*" OR "responsive survey design*" OR "total survey error*" OR "measurement error*"

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Exclusion criteria

- Not in English language
- Not a peer-reviewed research paper
- Not inside timeframe (2020 – current)
- Not using both survey *and* non-survey data

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