

The effect of survey mode on data quality

Experimental Evidence from Nigeria

Joint with P. Castaing, I. Contreras, A. Palacios-Lopez, A. Sagesaka, and P. Wollburg

Yannick Markhof (ETH Zurich)

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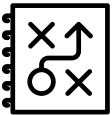
Overview



- Since COVID-19 pandemic phone surveys have become commonplace in LMICs and are now often used for development economics research



- Their properties (low-cost, quickly deployable, ...) offer a pragmatic response to two converging issues:
 - **Growing number and frequency of crisis** and shocks has increased demand for timely and high-frequency data
 - **Constrained budgets** for research and international development have reinforced the push for cost-effective approaches



- Moving from traditional in-person data collection to alternative approaches requires a firm grasp of the challenges and biases that come with alternative data collection modes



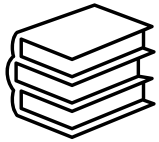
- Key issues: Limited phone coverage (sampling errors) and **potential mode effects (non-sampling errors)**
- Past literature largely focused on sampling errors in phone surveys that can be effectively mitigated through re-weighting, but less is known about measurement errors in phone surveys



- This study: survey experiment to identify survey mode effects across a broad range of outcome variables relevant to policymakers and researchers in LMICs

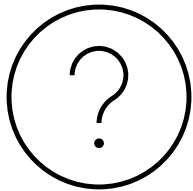
Limited evidence on why, when, and for whom mode effects occur

- **Documented mode effects** for outcomes such as 🌱 agricultural yields and production, 🛒 consumption, 📁 microenterprise data, and 🙄💊 contraceptive use
 - (Anderson et al., 2024; Kilic et al., 2021; Abate et al., 2023; Garlick et al., 2020; Greenleaf et al., 2020)
- Some outcomes such as 🍲 dietary diversity and ❤️ health may be **less sensitive to survey mode**
 - (Abate et al., 2023; Lamanna et al., 2019; Markhof et al., 2025)
- **Direction of mode effects vary** across studies: underreporting of consumption and overreporting of contraceptive use in phone surveys
- Most evidence cannot **disentangle mode effects from other survey errors**, nor do they systematically explore **mechanisms** driving mode effects

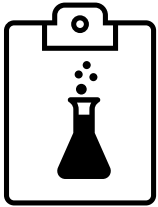


Research questions

- Do measured outcomes differ depending on which survey mode is used for data collection?
 - Do mode effects differ in different variables?
 - How do mode effects compare with other survey errors like coverage bias?
 - What mechanisms could explain differences between survey modes?
 - Implications for survey implementation and data analysis – what do we know, what don't we know, how do we find out?



Experimental design



- Survey experiment as part of Nigeria GHS-Panel 2023/24 (wave 5)
- Distribute phones to 937 households across 105 randomly selected agricultural EAs
- Randomly assign respondents to answer identical questions in-person and over the phone across time

Survey design factors under control:

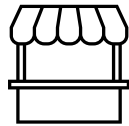


- **Coverage errors:** Distribute phones across randomly selected EAs for experiment
- **Respondent selection effects:** Target same respondent in both interviews (in-person & over phone)
- **Timing effects:** Conduct phone and in-person interview at most one week apart
- **Ordering effects:** Randomly vary the order of the in-person and phone interview: One group starts with phone interview, the other group starts with in-person interview

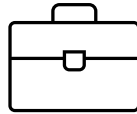
20 Outcomes across 6 topics



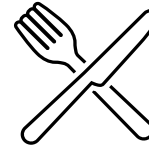
Health



Service access



Labor



Food security



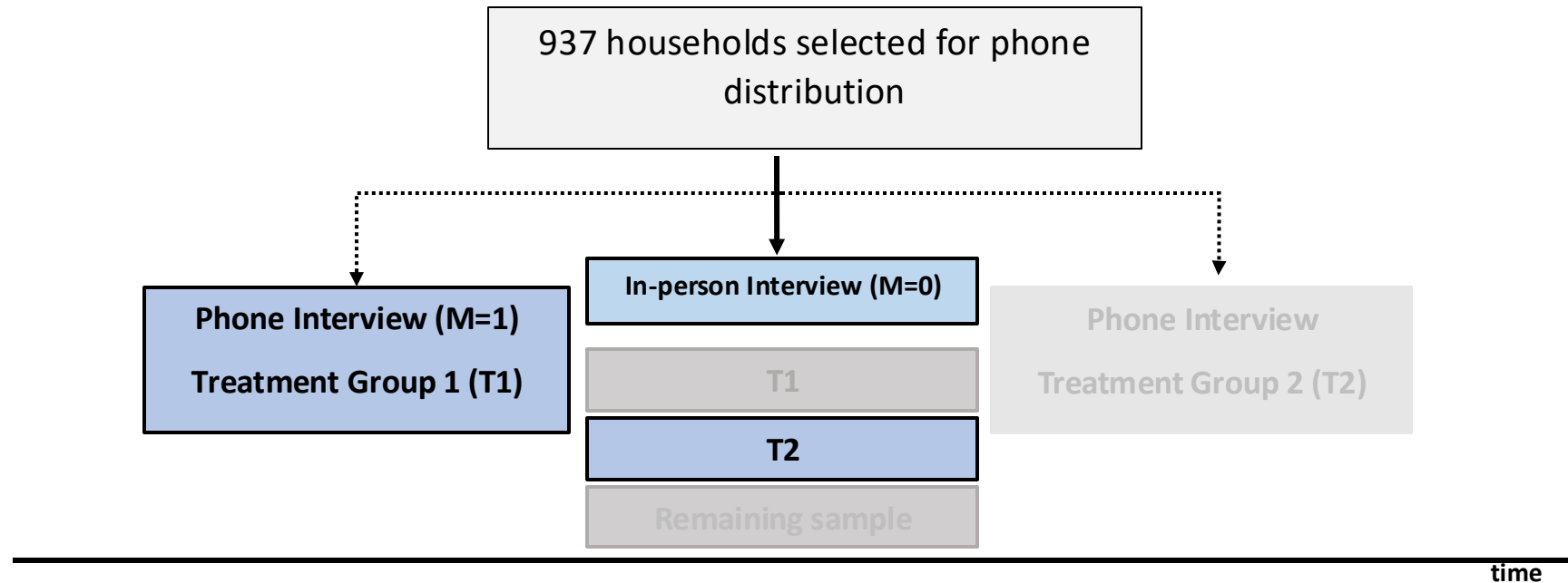
Subjective wellbeing



Shocks

Binary	Continuous	Count	Categorical
<ul style="list-style-type: none"> • Shocks • Household Enterprise • Health episodes/illnesses • Health service access • Labor 	<ul style="list-style-type: none"> • Health expenditure • Hours worked in Ag 	<ul style="list-style-type: none"> • Food consumption score • Dietary Diversity Score 	<ul style="list-style-type: none"> • Subjective wellbeing • Climate change perceptions • Locus of control

Empirical strategy - Exploiting between-respondent variation

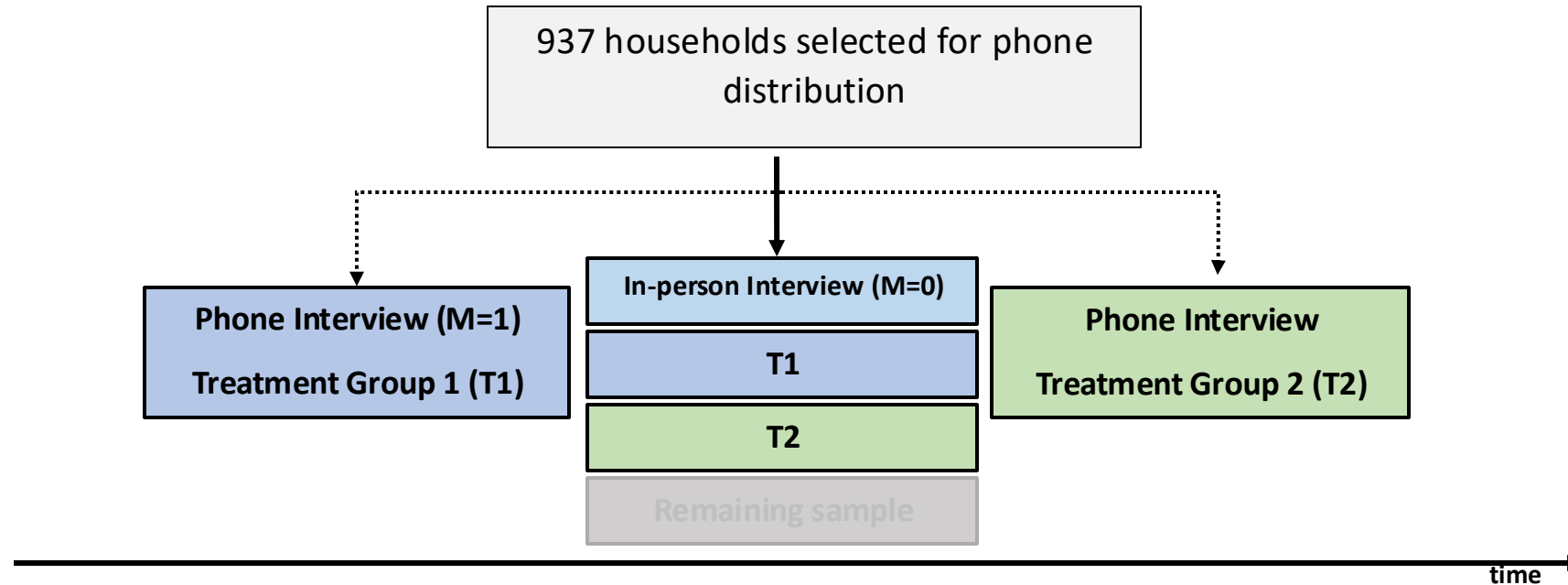


- Comparing the **phone interview of T1** to the **in-person interview of T2** provides a clean estimate of the average survey mode effect (*between design*)

$$Y_{ih} = \beta_0 + \beta_1 M_{ih} + \varepsilon_{ih}$$

- Use sample of household main respondents for balance (N=852)

Empirical strategy - Exploiting within-respondent variation



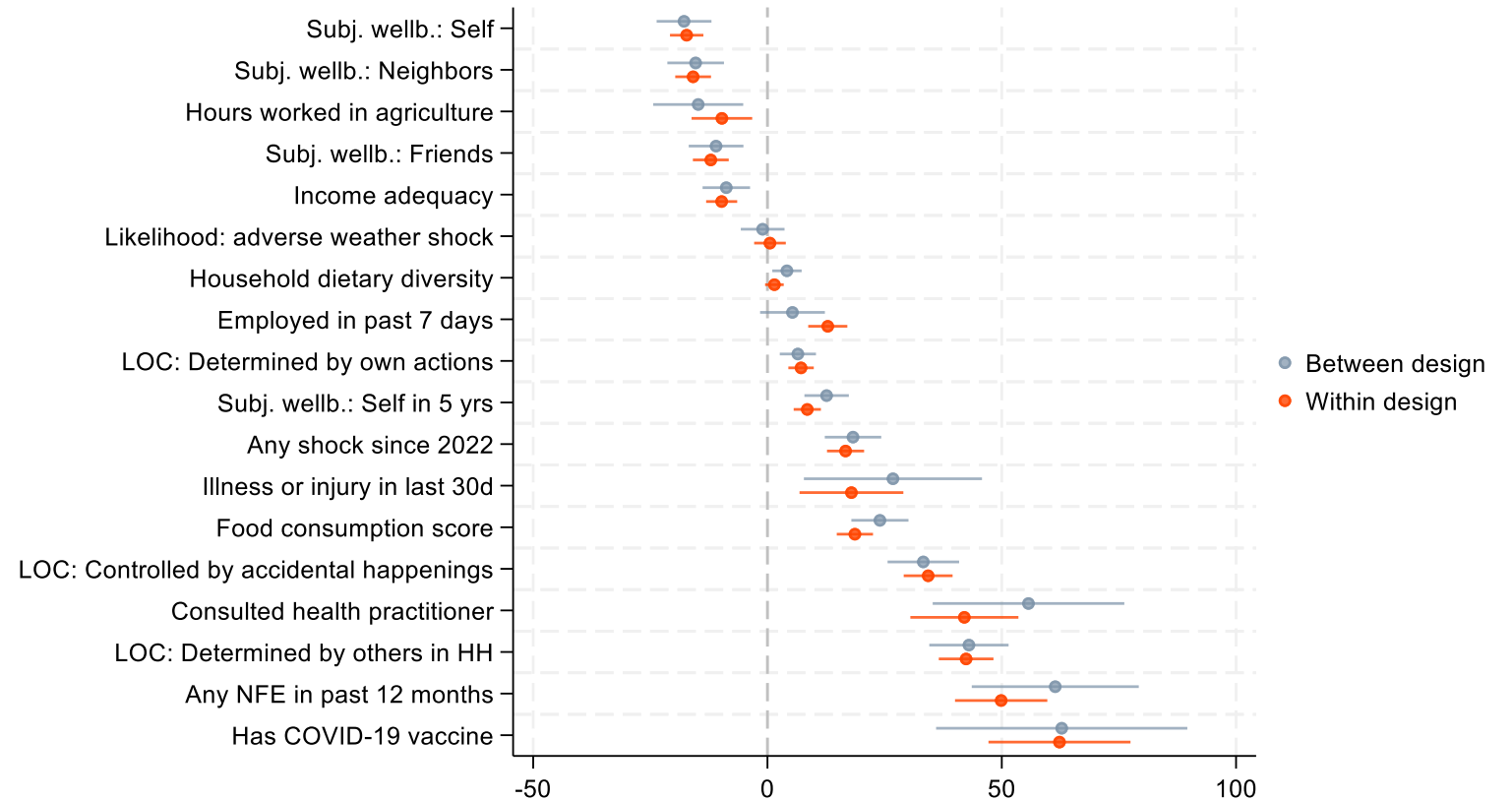
- Comparing the **phone interview of T1** to the **in-person interview of T1** and the **in-person interview of T2** to the **phone interview of T2** provides an alternative estimate of the survey mode effect (*within design*)

$$Y_{ihr} = \delta_0 + \delta_1 M_{ihr} + \varepsilon_{ihr}$$

- Use sample of household with respondents that completed both interviews (N=862). No concern about respondent selection effects since it's the same person, but concern of anchoring effects

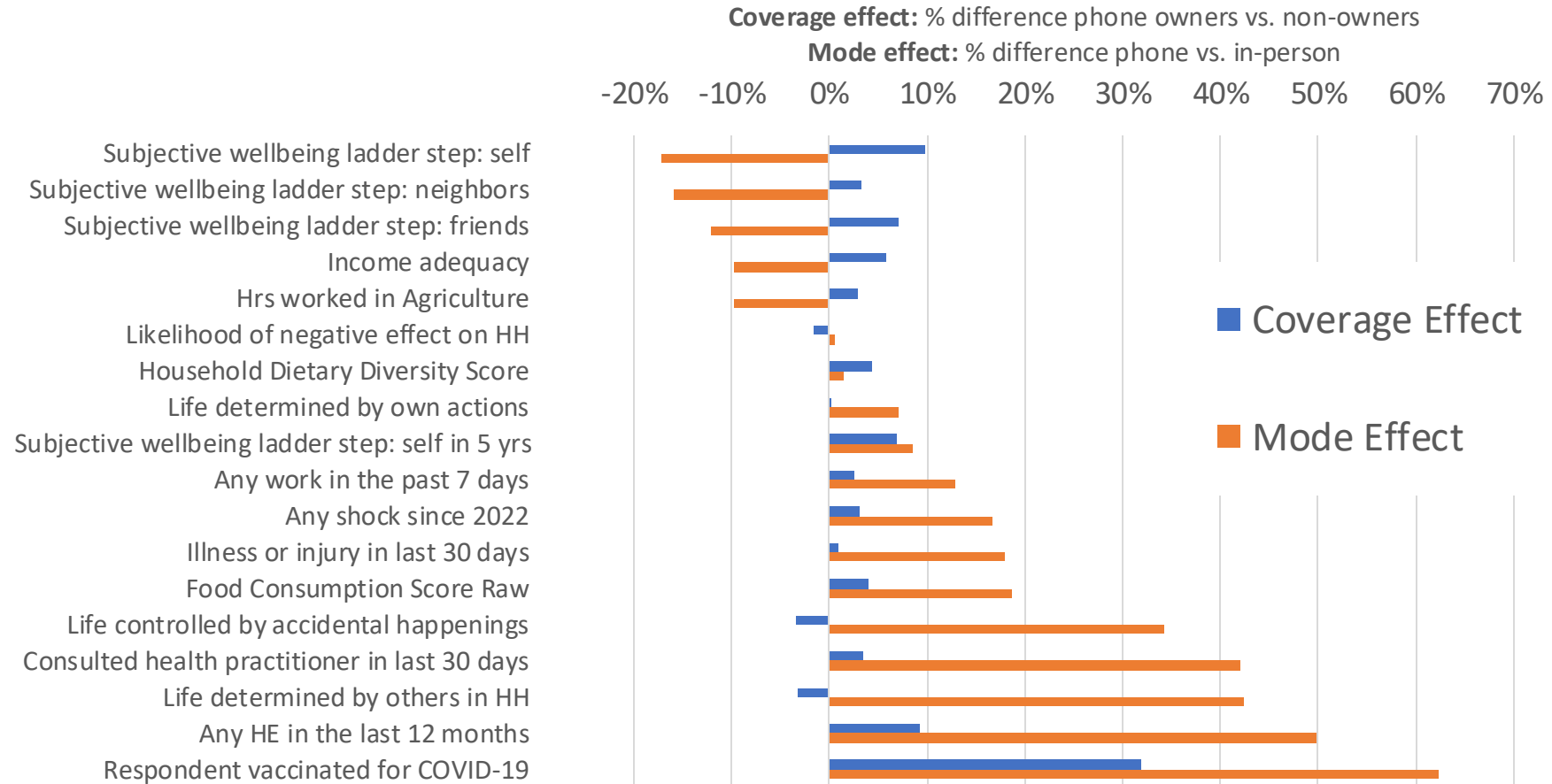
Strong evidence for average mode effects across all topics

- Responses collected over the phone differ on average **by 0 to 63% related to the in-person mean**
- Median mode effect at 18% (BR) and 17% (WR)
- No statistically significant average mode effect for 1 outcome
- Positive mode effects for 70% of outcomes



Note: Estimates are percentage change compared to in-person mean.

Mode effects match or exceed coverage errors in size



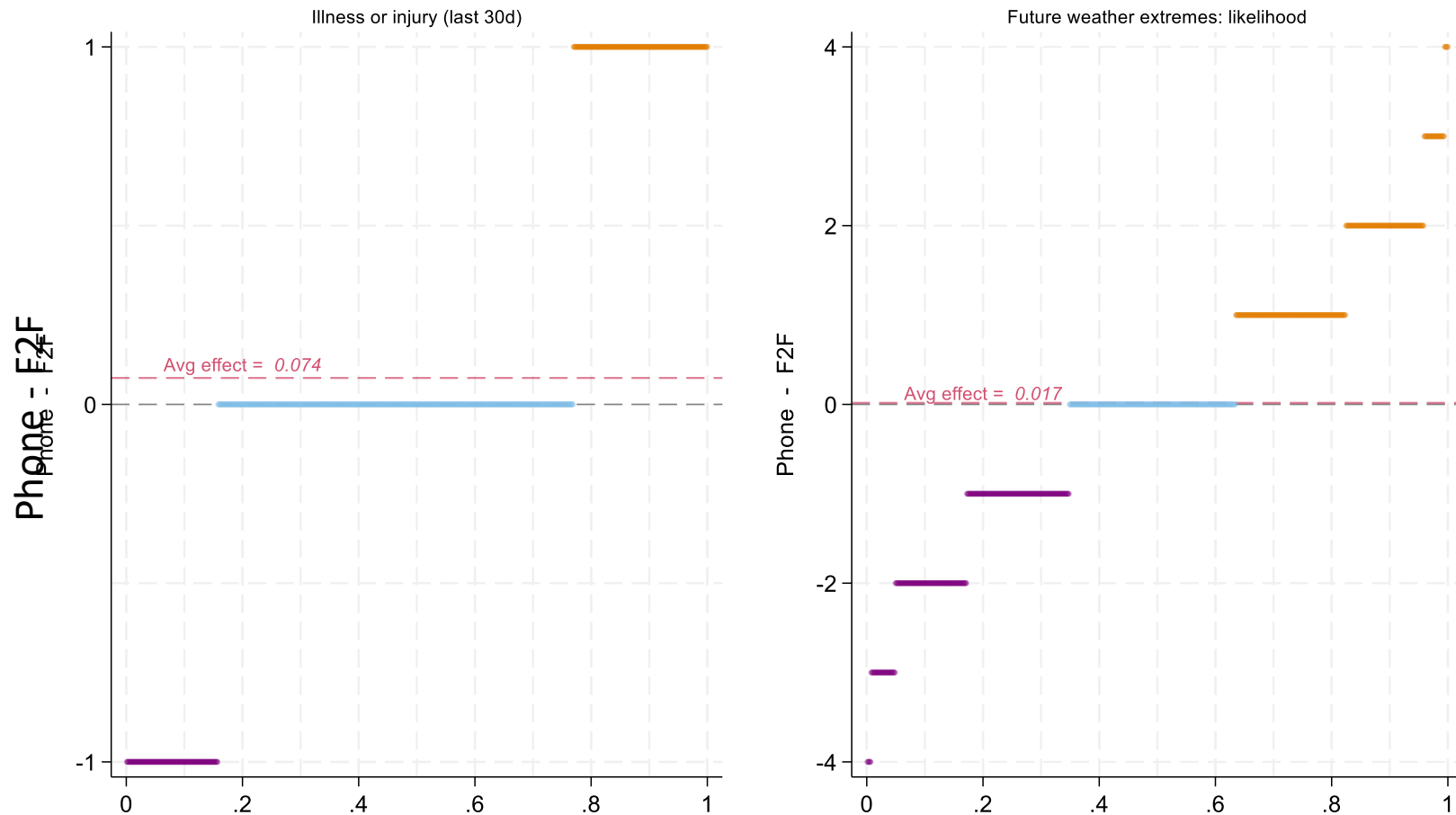
Empirical strategy – respondent-level mode effects

- Questions:
 - How much heterogeneity in mode effects is there?
 - Are mode effects more pronounced for specific groups of respondents?
 - Do survey design factors affect respondent behavior in ways that give rise to mode effects?
- Leverage the within-respondent design to obtain **respondent-level mode effects**
 - Calculate mode effects for each respondent and outcome as the difference between measured outcomes over the phone and in-person
 - Create a stacked dataset at the respondent-outcome level which allows us to pool our analysis and identify factors that systematically matter across outcomes
- Two key conditions need to hold:
 - Stability of true outcomes between the first and second interview of a respondent
 - No 'ordering' effects

Order of interviews does not affect survey responses

Time between both interviews <6 days
Time between interviews unrelated to measured outcomes at the second interview

Distribution of respondent-level mode effects



- A significant share of respondents whose responses differ across modes
- Diverging patterns are masked in average mode effect estimates
- The respondent-level mode effects vary much more than the average mode effects suggest in aggregate

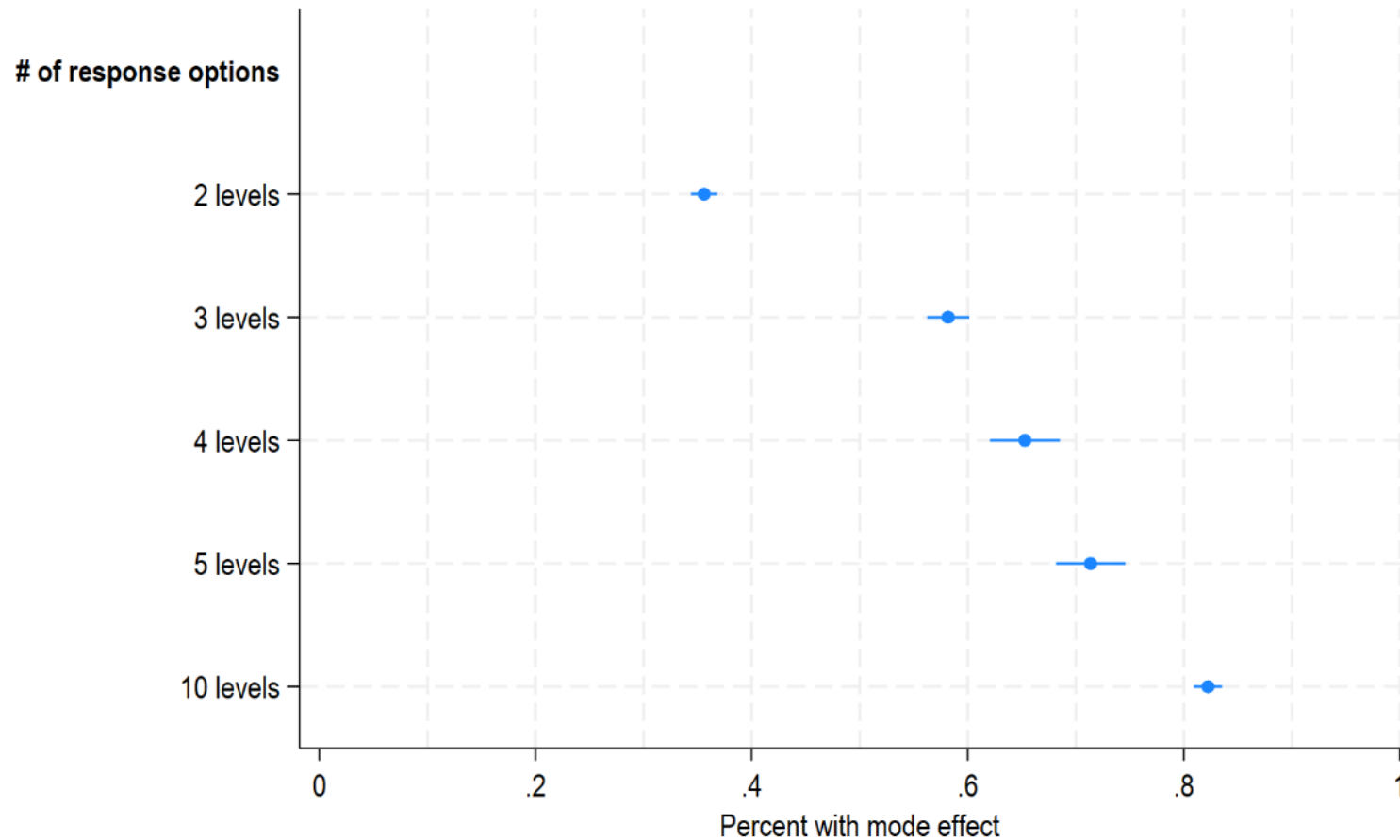
Mode effects less likely for more educated respondents

$$Y_{ik} = \beta_0 + \beta_1 X_i + \beta_2 E_i + \beta_3 H_i + \beta_4 \theta_i + \varepsilon_{ih}$$

	(1) Any mode effect (dummy)
Respondent female	0.0039 (0.0206)
Respondent age	0.0002 (0.0004)
Primary	-0.0396*** (0.0136)
Secondary	-0.0547*** (0.0157)
Tertiary	-0.0671*** (0.0179)
Resp. speaks interview lang. at home	-0.0093 (0.0121)
Resp. prev phone interview	-0.0207 (0.0235)
Household size	0.0005 (0.0018)
Household log total consumption	-0.0128 (0.0101)
Household part of HFPS	-0.0078 (0.0104)
Enumerator controls	YES
Outcome FE	YES
Sample	Categ.
Observations	12,455

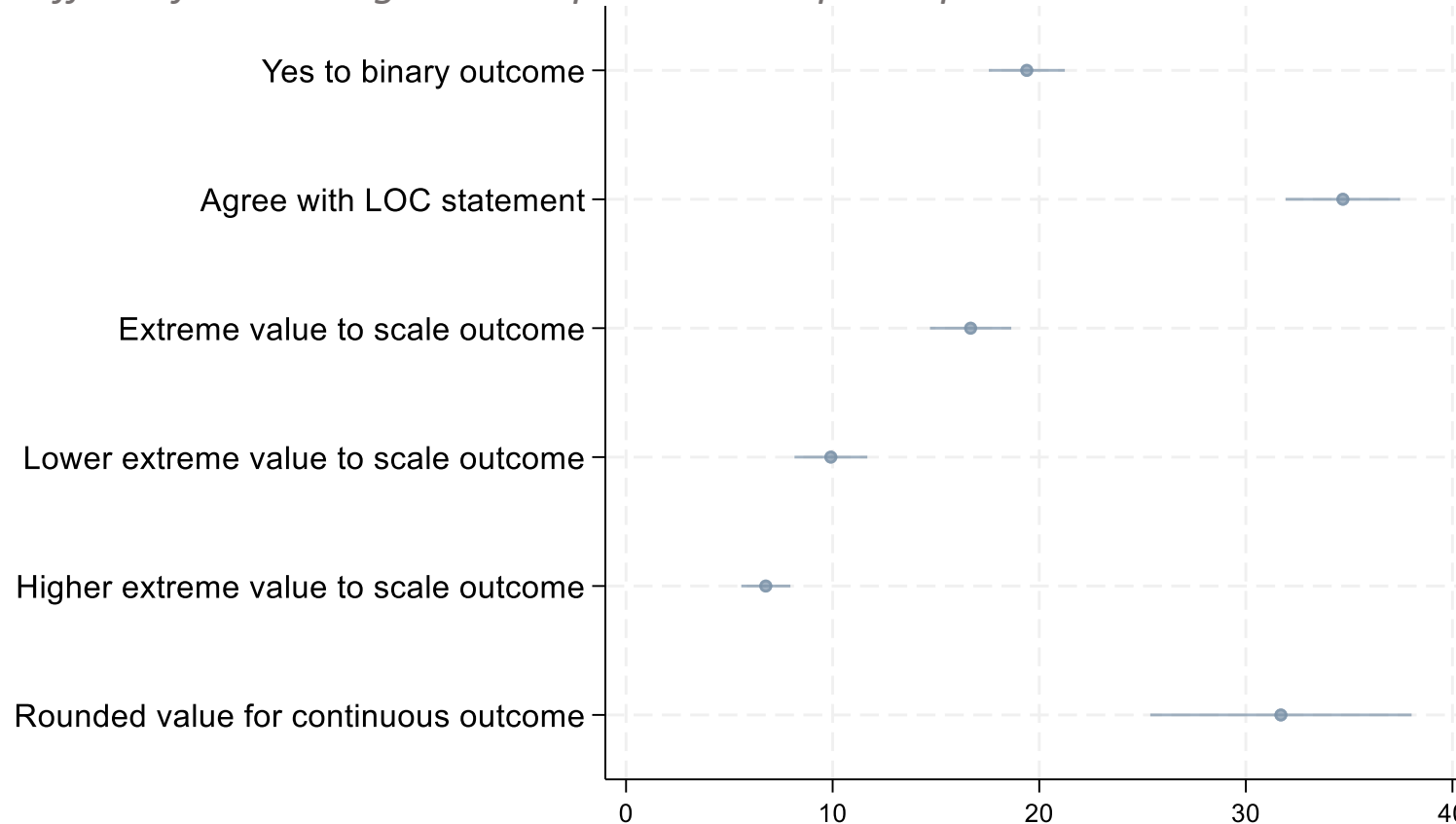
Results – mode effects increase with the number of response options

Figure: Share of inconsistent responses between the phone and in-person interview, by number of variable levels



Response patterns suggest lower respondent engagement via phone

Figure: Effect of answering over the phone on response patterns



Note: Estimates using the dataset at the outcome-respondent level.

Key takeaways

- Mode effects across the board, large relative to other errors
- Related to survey design factors and respondent characteristics
- Implications for survey design
 - **Standardize and harmonize:** Align questionnaires, enumerator training, and protocols across modes
 - **Test and pilot:** flag complexity, gather feedback, and implement cognitive interviews
 - **Leverage real-time survey management tools** to monitor respondent engagement, interviewer behavior, and indicators of low-quality data in real time
- Implications for data analysis and inference
 - **Measurement error as the norm:** Survey data in LMICs likely contain non-negligible measurement error, which can bias inference, distort statistics, and weaken monitoring and predictive tools
 - **Cross-mode comparisons or pooled datasets:** face substantial risks of bias, ‘mode dummy’ cannot fully address
 - **Within mode:** trends and inference (e.g., using frequent phone surveys) can be valid if errors are stable and uncorrelated with the outcome of interest

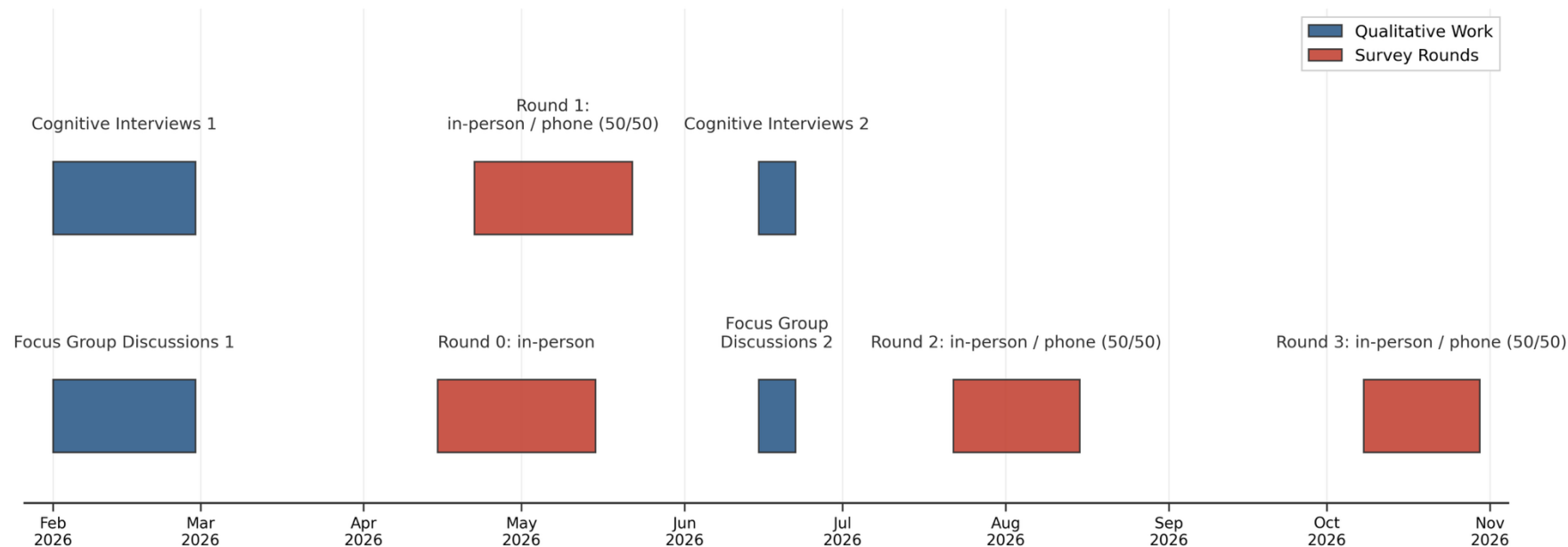
So, what now? Open question

1. **Absolute** measurement **error** (which mode is more accurate?)
2. Exact **mechanisms** on **respondent** side
 - a) Attention
 - b) Bandwidth (complexity, fatigue)
 - c) Effort
 - d) Perceptions/mental models
 - e) Honesty
3. Role of **enumerators**
 - a) Ability (innate ability, experience, rapport)
 - b) Effort / diligence
 - c) Fatigue
4. How to **mitigate** mode effects
 - a) Ex-ante: survey design, fieldwork protocols
 - b) During: real-time data quality checks and feedback, high-frequency audits of audio recordings
 - c) Ex-post: regression corrections / differencing out (respondent-level) mode effects (how stable are mode effects), low-cost data quality checks (e.g., consistency, cognitive probes, attention filters)

“The big beautiful experiment”

Panel Survey in Bangladesh (N = 1500 HHs, 50 EAs)

- 2 respondents per HH (one of which randomly selected)
- Random assignment (within geography) of enumerators to interviews (phone + F2F)
- Topical focus: livelihoods and climate hazards (esp. floods)
- Data quality measured via benchmarkable measures and checks
- Experiments to isolate different mechanisms
- Audio recordings of interviews for both modes to facilitate at-scale auditing and insights into implementation process



What else should we test?

ymarkhof@ethz.ch / ymarkhof@worldbank.org

Appendix: questions

- During the last 4 weeks, did you suffer from an illness or injury?
- During the past 4 weeks have you consulted a health practitioner or dentist or traditional healer or a Patient Medicine Vendor or visited a health centre?
- I would now like to know about your general wellbeing. Imagine ten steps, at the top of the ladder are the people who are the best off, those who have the most money, most education, and best jobs. At the bottom are the people who are the worst off, those who have the least money, least education, worst jobs, or no job.
 - A. On which step are you today? B. On which step are most of your neighbors today?
C. On which step are most of your friends today? D. On which step do you expect to be in 5 years?
- Considering the level of your current household income, would you say that you are living...well...fairly well...fairly...with difficulty
- Please indicate the degree to which you agree with each of the following statements. Disagree/ Neither Agree nor disagree/ Agree.
 - A. To a great extent, my life is controlled by accidental happenings B. My life is determined by my own actions. C. I feel like what happens in my life is mostly determined by others in my household.
- How likely is it that extreme weather events will negatively affect you and your household financially during the next 12 months?

Appendix: questions

- Labor:
 - In the last seven days, did you do any work for someone who is not a member of this household for payment in cash or in-kind?
 - In the last seven days, did you work in a non-farm household business that you operate, for one or more hours?
 - In the last seven days, did you work on household farming, raising livestock, fishing or forestry activities, for one or more hours?
 - How many hours did you work or help on a household farming, raising livestock, fishing or forestry activities in the last seven days?
- FCS/HDDS:
 - Over the past 7 days, how many days did you or others in your household consume any [...]? Grains and Flours; Starchy roots tubers and plantains; pulses, nuts and seeds; etc.
- Health expenditure:
 - Over the past 12 months, did the household purchase or pay for any health expenditure?
 - In total, how much did the household spend on health expenditure in the past 12 months?
- NFE: During the past 12 months, has anyone in your household... YES/NO for 8 categories
- Shock: Since January 2022, has your household been affected by...? YES/NO for 28 categories

Appendix: additional information on the experimental setting

- 937 phones and sim cards distributed to households during the post-planting visit
- Incentive : 1,500 Naira Credit (~ \$1) per respondent; up to 3,000 Naira per household
- Target of 5 days between the in-person survey and the phone survey
- 4 previous rounds were administered before mm5
 - The targeted main respondent for mm5 was the household member that answered
 - most of the previous phone interviews.
- Household Response rate for the phone survey was 93%



Appendix: balance tables

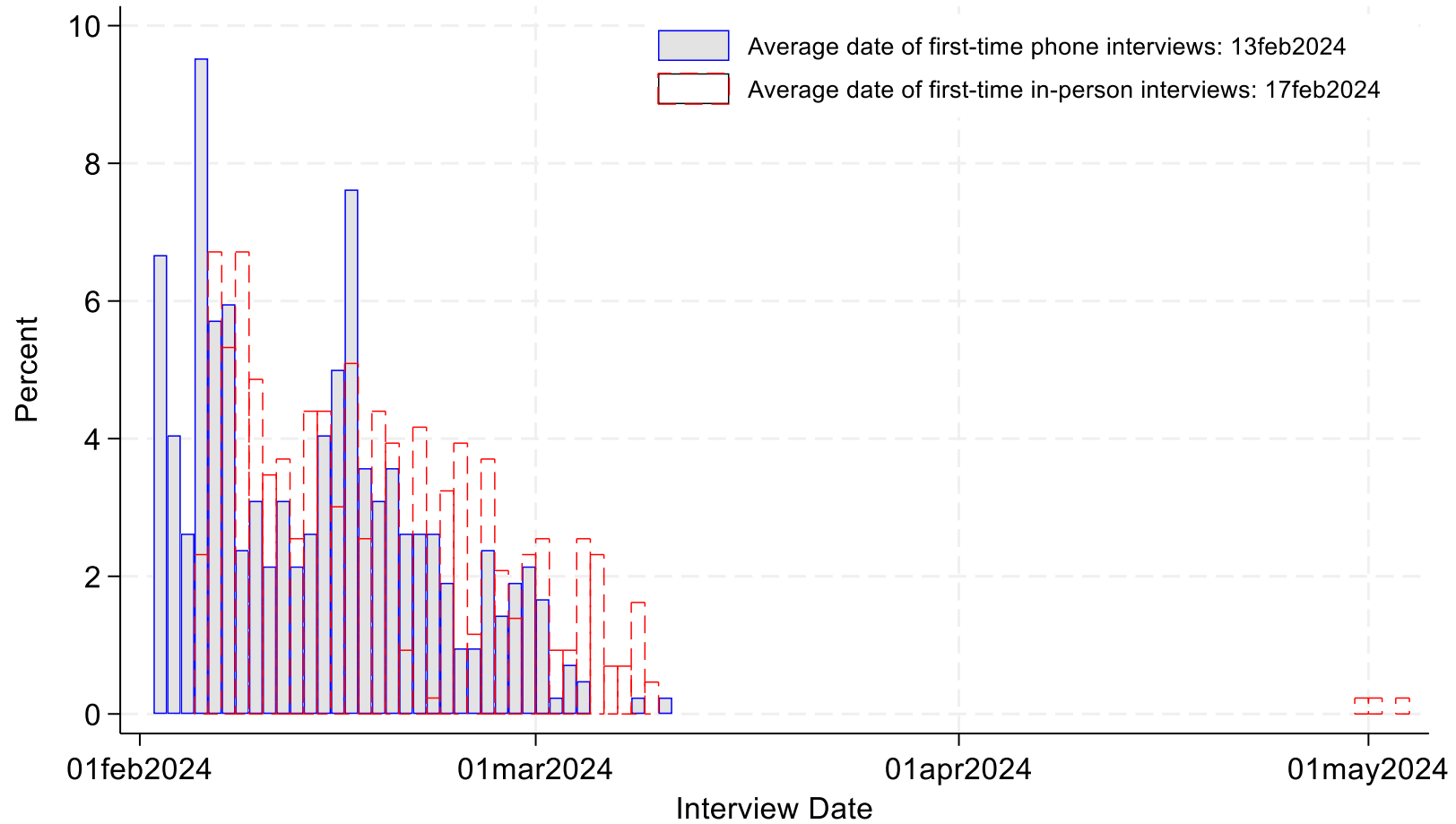
		(1)		(2)	t-test
		F2F interview		Phone interview	Difference
Variable	N/[Clusters]	Mean/SE	N/[Clusters]	Mean/SE	(1)-(2)
Female	432	0.289	420	0.290	-0.001
	[432]	[0.022]	[420]	[0.022]	
Age	432	49.514	420	49.026	0.488
	[432]	[0.717]	[420]	[0.739]	
Respondent is household head	432	0.824	420	0.812	0.012
	[432]	[0.018]	[420]	[0.019]	
Household size	432	5.731	420	5.576	0.155
	[432]	[0.165]	[420]	[0.172]	
Dependency ratio	432	1.001	420	0.900	0.100*
	[432]	[0.041]	[420]	[0.034]	

		(1)		(2)	t-test
		F2F first		Phone first	Difference
Variable	N/[Clusters]	Mean/SE	N/[Clusters]	Mean/SE	(1)-(2)
Household size	875	5.723	836	5.562	0.161
	[443]	[0.164]	[424]	[0.170]	
Dependency ratio	875	0.997	836	0.900	0.097*
	[443]	[0.041]	[424]	[0.034]	
Female household head	875	0.239	836	0.221	0.018
	[443]	[0.020]	[424]	[0.020]	
Age of household head	875	53.133	836	52.931	0.202
	[443]	[0.695]	[424]	[0.696]	

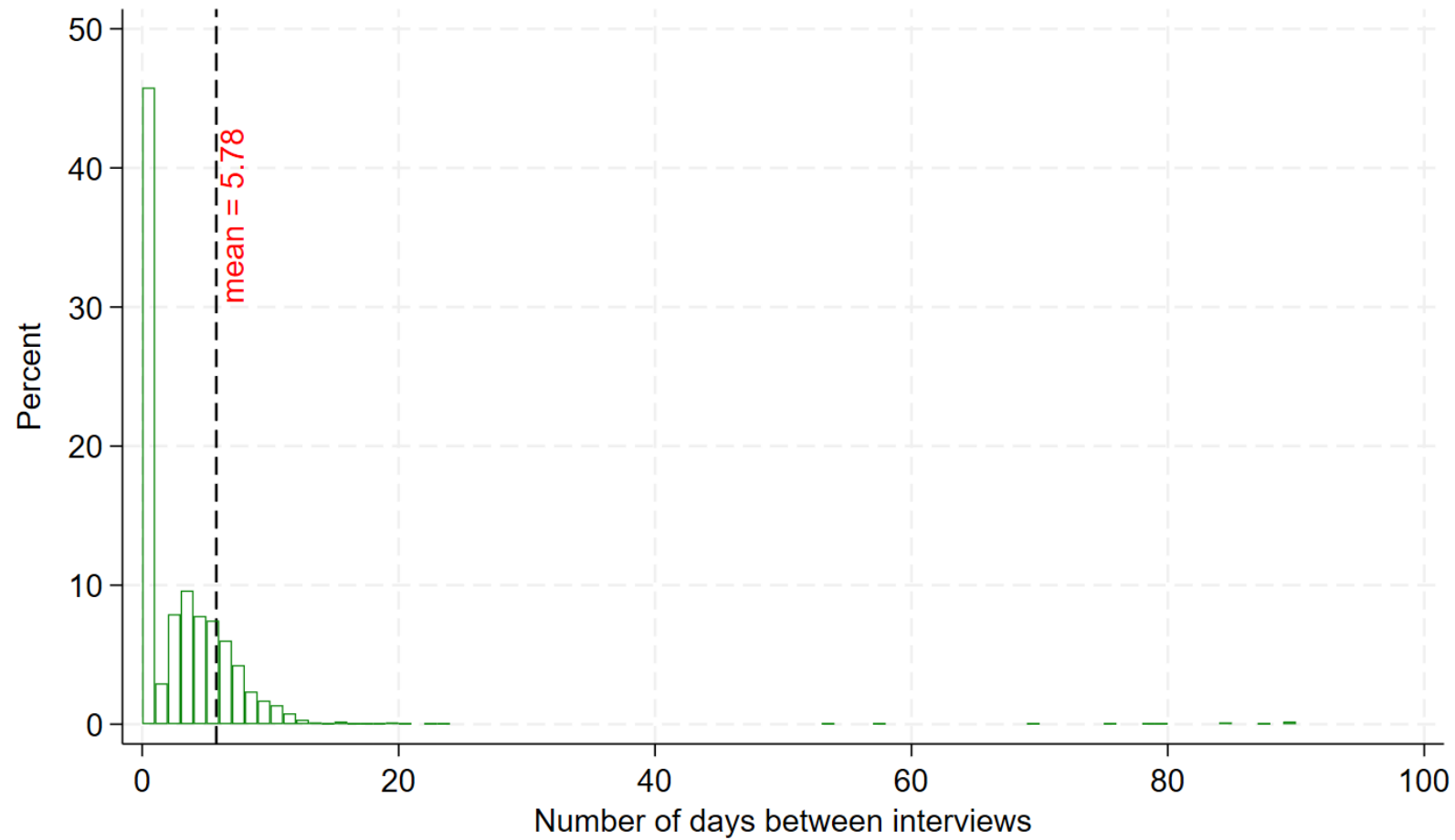
Appendix: distribution of mode effects across the two designs



Appendix: Dates of first-time interviews across survey mode

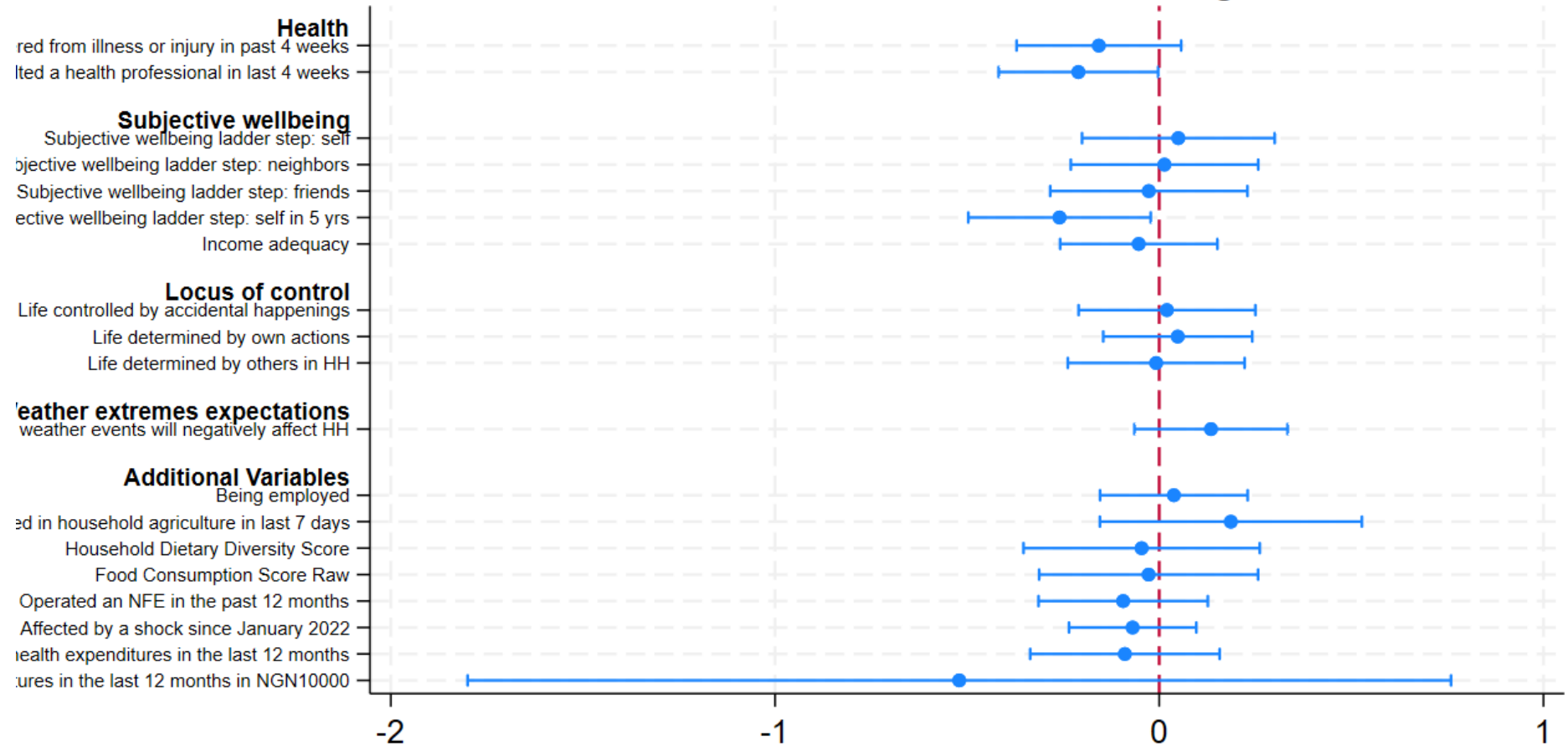


Appendix: Number of days between interviews of same respondents



Appendix: anchoring effects

Mode effect: Between design



Note: OLS regressions of various outcomes on a dummy for the survey mode of the interview, fully interacted with a set of household fixed effects (either over the phone or in person). Sample: Identical respondents interviewed via phone or face-to-face interview.

Appendix: anchoring effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Illness in last 30 days	Consulted health practitioner	Wellbeing (self)	Wellbeing (neighbors)	Wellbeing (friends)	Wellbeing (in 5y)	Income adequacy	Life controlled by accidental happenings	Life determined by own actions	Life determined by others in HH	Weather extremes likelihood
Phone interview × Respondent previously interviewed	-0.157 (0.109)	-0.210** (0.106)	0.0499 (0.128)	0.0138 (0.124)	-0.0271 (0.131)	-0.259** (0.121)	-0.0533 (0.104)	0.0202 (0.117)	0.0482 (0.0988)	-0.00789 (0.117)	0.135 (0.102)
Phone interview	0.230*** (0.0696)	0.485*** (0.0673)	-0.467*** (0.0814)	-0.432*** (0.0855)	-0.331*** (0.0886)	0.419*** (0.0780)	-0.223*** (0.0689)	0.753*** (0.0777)	0.233*** (0.0698)	0.896*** (0.0785)	-0.0535 (0.0714)
Respondent previously interviewed (F2F or over phone)	0.0655 (0.0693)	0.126* (0.0692)	0.0183 (0.0696)	0.0415 (0.0704)	0.00715 (0.0704)	0.128* (0.0697)	0.0510 (0.0695)	-0.00907 (0.0695)	0.0220 (0.0695)	-0.0445 (0.0695)	0.00446 (0.0724)
Constant	-0.0321 (0.0482)	-0.0616 (0.0481)	-0.00896 (0.0487)	-0.0201 (0.0487)	-0.00347 (0.0485)	-0.0622 (0.0499)	-0.0250 (0.0476)	0.00444 (0.0480)	-0.0108 (0.0485)	0.0218 (0.0485)	-0.00218 (0.0503)
Observations	1,668	1,668	1,654	1,618	1,620	1,638	1,660	1,660	1,660	1,660	1,530

Note: OLS regressions of various outcomes on a dummy for the survey mode of the interview, fully interacted with a dummy for whether the respondent had been previously interviewed (either over the phone or in person). Sample: Identical respondents interviewed via phone or face-to-face in random order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix: anchoring effects

	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
	Being employed	Hours worked/help ed in household agriculture in last 7 days	Household Dietary Diversity Score	Food Consumptio n Score Raw	Operated an NFE in the past 12 months	Affected by a shock since January 2022	Paid for health expenditures in the last 12 months	Total health expenditures in the last 12 months in NGN10000
Phone interview × Respondent previously interviewed	0.0381 (0.0978)	0.187 (0.173)	-0.0458 (0.156)	-0.0275 (0.145)	-0.0938 (0.112)	-0.0692 (0.0843)	-0.0893 (0.126)	-0.520 (0.645)
Phone interview	0.102 (0.0626)	-0.271** (0.108)	0.117 (0.100)	0.636*** (0.0991)	0.633*** (0.0708)	0.411*** (0.0604)	1.121*** (0.0848)	1.730*** (0.418)
Respondent previously interviewed (F2F or over phone)	0.00322 (0.0654)	-0.0534 (0.112)	0.0637 (0.0910)	0.0725 (0.0909)	0.0364 (0.0818)	0.0634 (0.0786)	0.0825 (0.0838)	-0.109 (0.207)
Constant	0.121*** (0.0457)	0.0964 (0.0773)	-0.0301 (0.0618)	-0.0342 (0.0622)	-0.0176 (0.0569)	-0.0309 (0.0566)	-0.0395 (0.0565)	0.0596 (0.188)
Observations	1,602	670	974	974	1,198	1,292	1,146	212

Note: OLS regressions of various outcomes on a dummy for the survey mode of the interview, fully interacted with a dummy for whether the respondent had been previously interviewed (either over the phone or in person). Sample: Identical respondents interviewed via phone or face-to-face in random order. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix: coverage effects

Table - Coverage effects, respondent and household characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Female	Age	Completed secondary school	Respondent is household head	Household size	Female household head	Log annual household consumption
Individual owns a phone	-0.143*** (0.0256)	4.349*** (0.895)	0.199*** (0.0254)	0.189*** (0.0254)			
Household owns a phone					0.726** (0.325)	-0.0393 (0.0379)	0.104** (0.0499)
Constant	0.584*** (0.0199)	41.67*** (0.737)	0.333*** (0.0195)	0.400*** (0.0198)	5.135*** (0.290)	0.237*** (0.0341)	12.82*** (0.0448)
Observations	1,572	1,572	1,523	1,572	732	732	861

Note: OLS regressions of various respondent and household characteristics on phone ownership at baseline. For respondent characteristics, phone ownership is identified at the individual level. For household level characteristics, it is identified at the household level. Sample: All phone survey respondents (individual characteristics) or all households with a phone and in-person interview (household characteristics). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

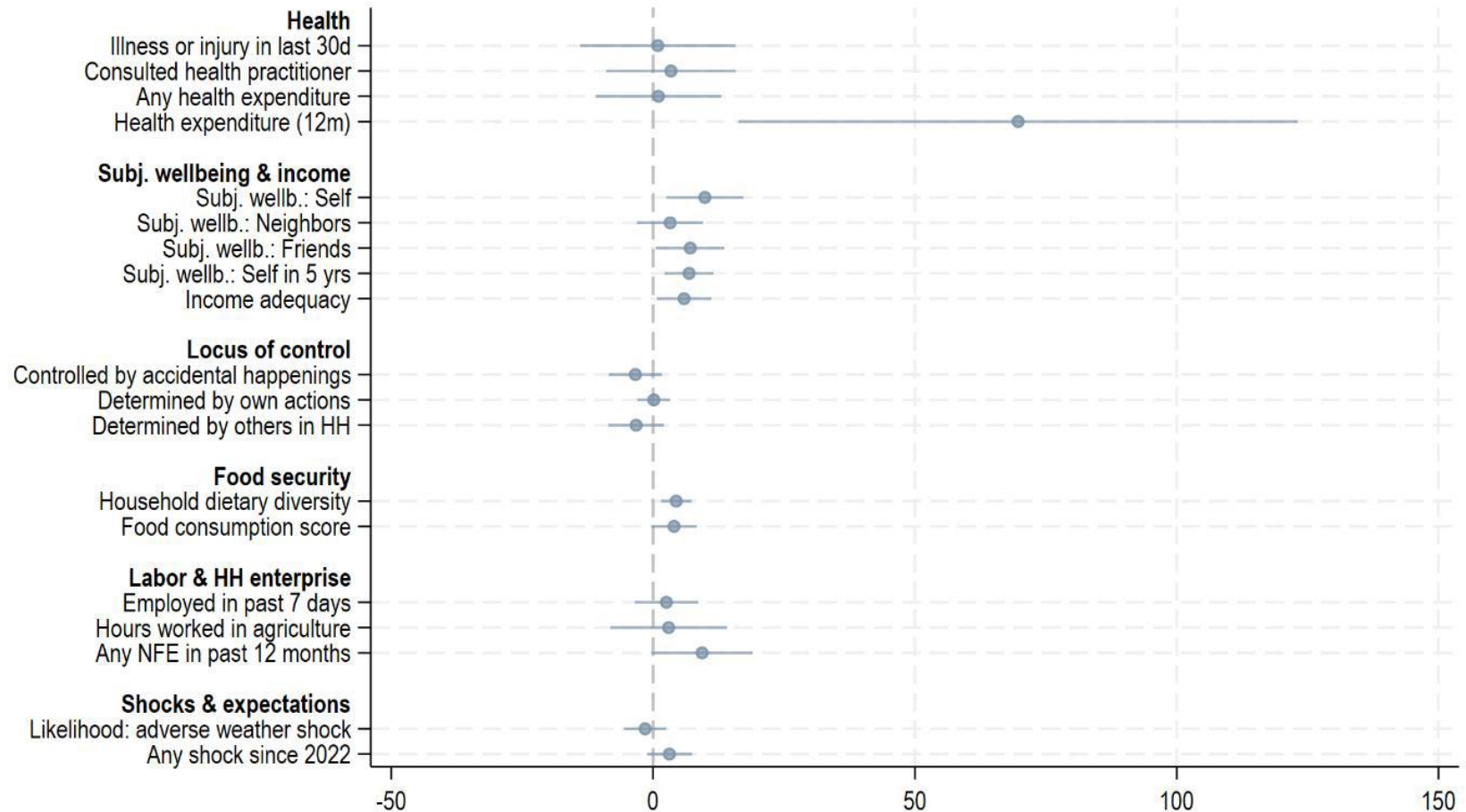
Appendix: coverage effects

Table – Coverage effects, main outcomes, household-level phone ownership

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
	Illness or injury in last 30 days	Consulted health practitioner in last 30 days	Any health expenditure in last 12 months	Total health expenditure (in NGN10'000)	Subjective wellbeing ladder step: self	Subjective wellbeing ladder step: neighbors	Subjective wellbeing ladder step: friends	Subjective wellbeing ladder step: self in 5 yrs	Income adequacy	Life controlled by accidents happenings	Life determined by own actions	Life determined by others in HH	Household Dietary Diversity Score	Food Consumption Score Raw	Any work in the past 7 days	Hours worked in agriculture in last 7 days	Any HE in the last 12 months	Likelihood of negative effect on HH	Any shock since 2022
Previous phone owner (household)	0.00402 (0.0337)	0.0181 (0.0326)	0.00479 (0.0287)	1.714*** (0.571)	0.376*** (0.132)	0.130 (0.126)	0.294** (0.130)	0.472*** (0.156)	0.122** (0.0526)	-0.0683 (0.0534)	0.00361 (0.0420)	-0.0632 (0.0541)	0.342*** (0.112)	2.186* (1.163)	0.0195 (0.0232)	0.617 (1.154)	0.0609** (0.0299)	-0.0494 (0.0680)	0.0275 (0.0190)
Constant	0.449*** (0.0301)	0.531*** (0.0290)	0.474*** (0.0253)	2.458*** (0.256)	3.805*** (0.116)	3.985*** (0.111)	4.142*** (0.116)	6.863*** (0.140)	2.060*** (0.0453)	2.017*** (0.0472)	2.609*** (0.0372)	1.951*** (0.0482)	7.747*** (0.0970)	54.54*** (1.022)	0.767*** (0.0209)	20.73*** (0.996)	0.651*** (0.0262)	3.239*** (0.0601)	0.883*** (0.0171)
Observations	1,668	1,668	1,430	256	1,654	1,618	1,620	1,638	1,660	1,660	1,660	1,660	1,356	1,356	2,474	912	1,442	1,530	1,494
Had phone vs. had no phone, % change	0.9	3.4	1.0	69.7	9.9	3.3	7.1	6.9	5.9	-3.4	0.1	-3.2	4.4	4.0	2.5	3.0	9.4	-1.5	3.1

Note: OLS regressions of various outcomes on a dummy for whether the household owned a phone before data collection. Sample: Phone and in-person interviews from identical respondents. Clustered standard errors at individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix: coverage effects



Note: Estimates are percentage change compared to households without a phone at baseline.

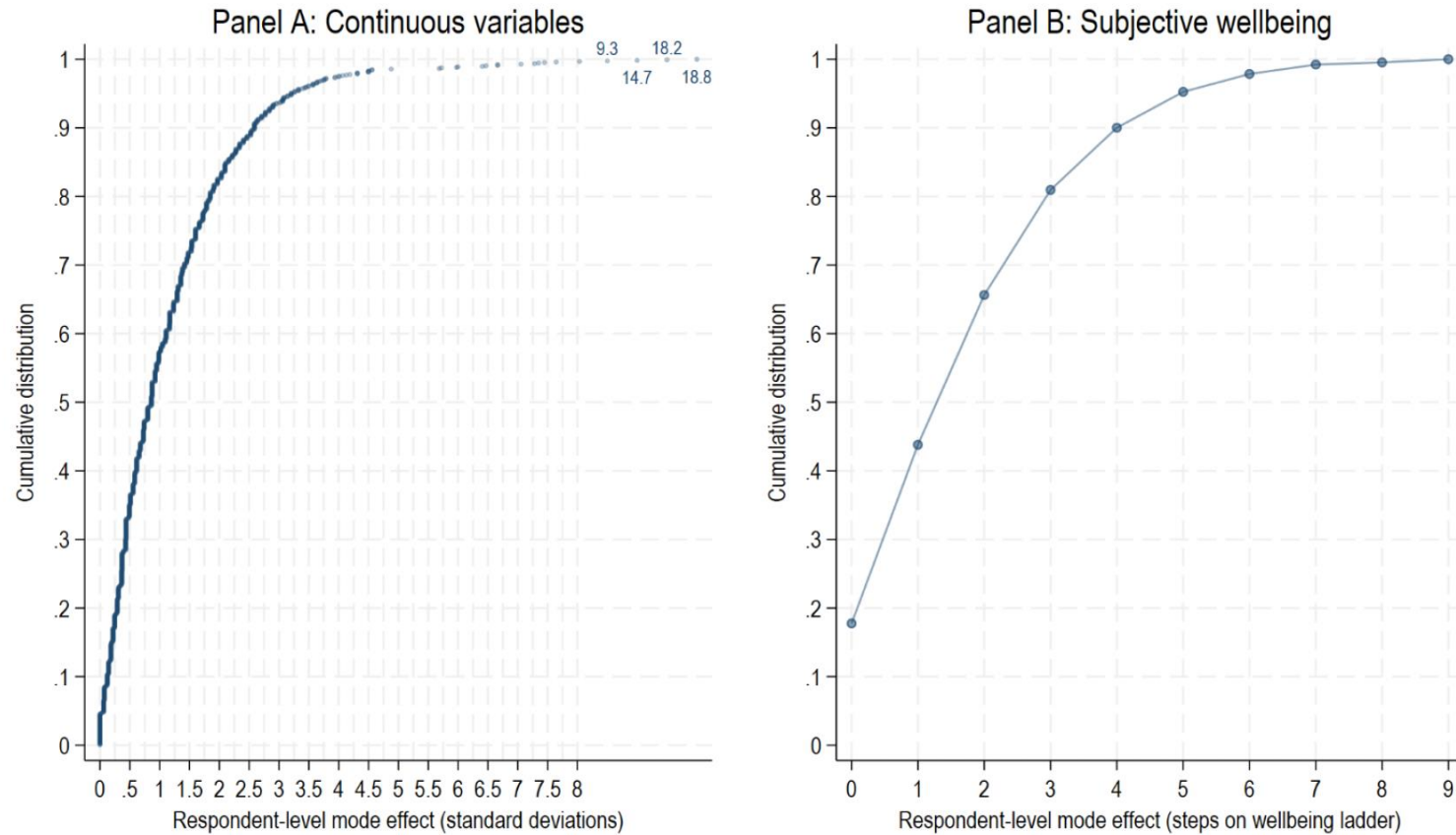
Appendix: coverage effects

Table – Coverage effects, mode, and anchoring effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
	Illness or injury in last 30 days	Consulted health practitioner in last 30 days	Any health expenditure in last 12 months	Total health expenditures (in NGN10'000)	Subjective wellbeing ladder step: self	Subjective wellbeing ladder step: neighbors	Subjective wellbeing ladder step: friends	Subjective wellbeing ladder step: self in 5 yrs	Income adequacy	Life controlled by accidental happenings	Life determined by own actions	Life determined by others in HH	Household Dietary Diversity Score	Food Consumption Score Raw	Any work in the past 7 days	Hours worked in agriculture in last 7 days	Any HE in the last 12 months	Likelihood of negative effect on HH	Any shock since 2022
Previous phone owner	0.00402 (0.0337)	0.0181 (0.0326)	0.00614 (0.0322)	1.410** (0.594)	0.376*** (0.132)	0.130 (0.126)	0.294** (0.131)	0.472*** (0.156)	0.122** (0.0526)	-0.0683 (0.0534)	0.00361 (0.0420)	-0.0632 (0.0541)	0.237* (0.129)	2.178 (1.424)	0.0178 (0.0270)	0.141 (1.400)	0.0643** (0.0327)	-0.0494 (0.0680)	0.0213 (0.0198)
Phone interview	0.0745*** (0.0215)	0.189*** (0.0213)	0.465*** (0.0253)	3.969*** (0.770)	-0.776*** (0.0859)	-0.707*** (0.0913)	-0.563*** (0.0944)	0.590*** (0.0997)	-0.222*** (0.0404)	0.575*** (0.0390)	0.180*** (0.0337)	0.666*** (0.0395)	0.138 (0.0941)	10.31*** (1.110)	0.0534*** (0.0168)	-2.446*** (0.937)	0.292*** (0.0225)	0.0154 (0.0549)	0.138*** (0.0154)
Phone interview before in-person interview	-0.00640 (0.0215)	0.0103 (0.0213)	0.0164 (0.0253)	-0.997 (0.770)	0.0759 (0.0859)	0.0805 (0.0913)	-0.0105 (0.0944)	-0.00414 (0.0997)	0.0217 (0.0404)	0.000790 (0.0390)	0.0322 (0.0337)	-0.0361 (0.0395)	0.0601 (0.0941)	0.974 (1.110)	0.00984 (0.0168)	0.548 (0.937)	-0.00524 (0.0225)	0.0794 (0.0549)	0.0105 (0.0154)
Constant	0.415*** (0.0336)	0.431*** (0.0326)	0.235*** (0.0329)	1.120* (0.623)	4.154*** (0.128)	4.299*** (0.121)	4.429*** (0.124)	6.571*** (0.150)	2.161*** (0.0534)	1.730*** (0.0525)	2.503*** (0.0438)	1.636*** (0.0534)	7.671*** (0.119)	48.75*** (1.425)	0.770*** (0.0273)	22.93*** (1.384)	0.497*** (0.0341)	3.192*** (0.0702)	0.820*** (0.0239)
Observations	1,668	1,668	1,146	212	1,654	1,618	1,620	1,638	1,660	1,660	1,660	1,660	974	974	1,602	670	1,198	1,530	1,292

Note: OLS regressions of various outcomes on a dummy for whether the household owned a phone before data collection. Sample: Phone and in-person interviews from identical respondents. Clustered standard errors at individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Figure 5. Distribution of mode effects at respondent level



Note: Panel A plots the cumulative distribution of respondent-level mode effects (expressed in standard deviations of the outcome when measured in-person) for all continuous outcome variables (food consumption score, health expenditure, hours worked in agriculture). Panel B does the same for the subjective wellbeing which is measured on a scale between 0 and 10.

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