

# Measuring dietary diversity with high frequency mobile phone interviews

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We designed and experimentally validated a novel high-frequency phone survey method for measuring diet diversity, a core outcome in development, in a sample of ultra-poor women in Ethiopia.

## A Tradeoff: Reference vs. Recall Periods

- Surveys on diet diversity face two related design choices:
  - Recall period:** the time over which choices are remembered by the respondent during the survey (e.g. what did you eat last week?)
  - Reference period:** the time over which a key outcome is measured
- This **generates a tradeoff** if reference and recall periods are the same:
  - Longer **reference period:** increases opportunity to observe seasonal, cyclical, or occasional items → **reduces errors of omission**
  - Longer **recall period:** increases *cognitive burden* of survey → **exacerbates recall error** (e.g. reversion to "usual" practices, telescoping)

## Our Survey Method: Bounded Recall

- Our solution for this tradeoff: **short bounded recall periods**
  - Extends the *reference* period without using a long *recall* period
- Randomized evaluation (figure 1):**
  - Frequent bounded recall (FBR):** short calls twice/day over 7 days calls marked with 'x' → bounded recall (BR) period between calls
  - Single interview (SI):** control respondents reported on their diet during a traditional in-person survey, length of reference = recall
- Pre-specified outcome: diet diversity scores:**
  - Enumerators, listening to women describe meals and their ingredients, coded consumption using a list of 20 food groups
  - We constructed two commonly used measures:
    - Household diet diversity scores (HDDS)
    - Women's diet diversity scores (WDDS)
- We empirically test for differences in reported dietary diversity for two standard reference periods (24 hours and 7-days)

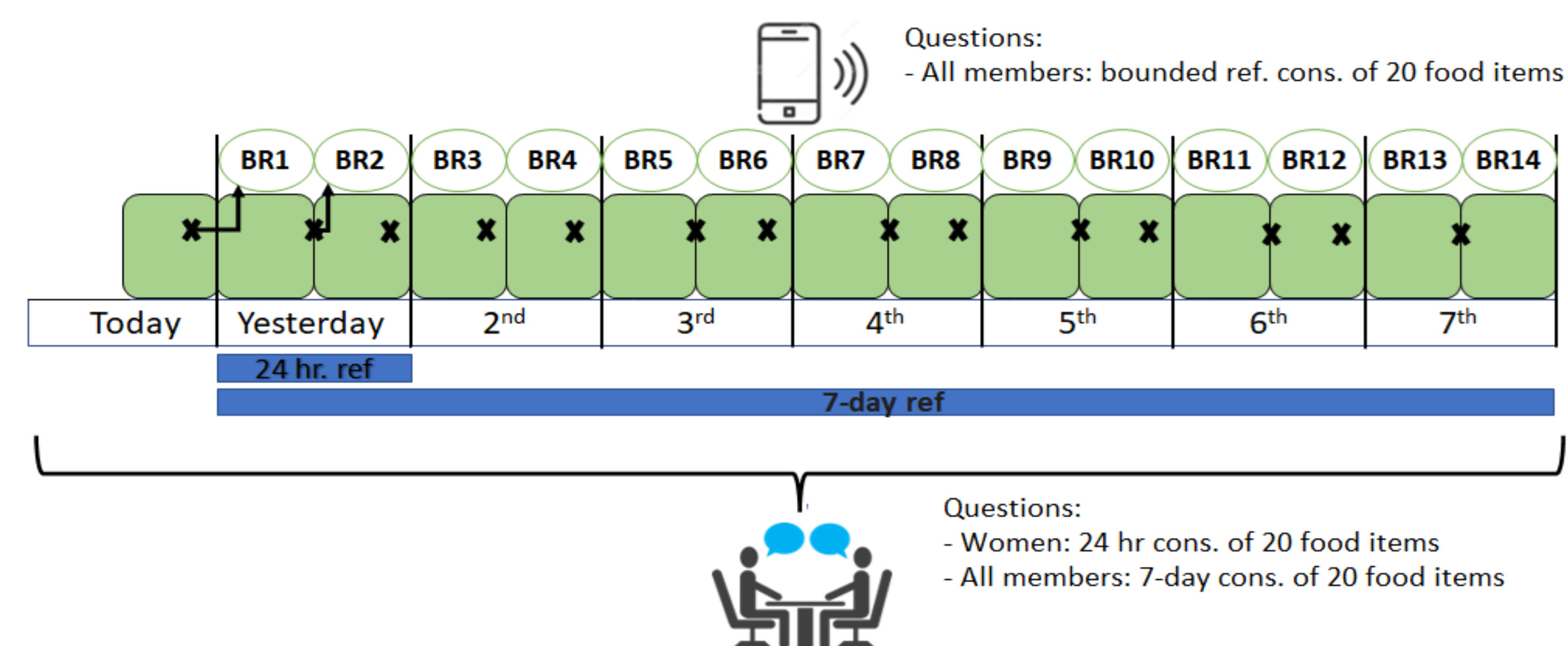


Figure 1. Each of a series of 14 phone calls (the black X) covers a bounded recall period (green boxes, top) of a few hours. The control group received a single interview in person covering an entire 24-hour or 7-day reference period (blue boxes, bottom). Diet diversity scores can be constructed for both groups based on aggregating over all food groups mentioned.

## No Differences in Diet Diversity Scores

- Comparing diet diversity scores constructed in the standard way shows **no significant differences** across the two survey methods.
- But frequent bounded recall over 7 days do capture more total food groups.

	Standardized Diet Diversity Scores		Total Number of Food Groups	
	Women's	Household	24 hours	7 days
Treatment [1 if FBR]	.0292 (.0685)	-.188 (.121)	.0699 (.158)	.584*** (.208)
Control group mean	2.903 (0.039)	5.592 (0.065)	6.42 (0.078)	7.98 (0.099)
N	621	642	621	642

Note: all models include day of week fixed effects, village fixed effects and additional controls; Standard errors in parentheses and are clustered by village; \* p<0.10, \*\* p<0.05, \*\*\* p<0.01

Table 1. Differences in dietary diversity scores across survey methods.

## Differences by Food Group

- Short reference period (24 hours) differences** (Fig. 2, in blue):
  - No difference in likelihood of reporting a food group by survey type
- Longer reference period (7 days) differences** (Fig. 2, in red):
  - Depend on the food group
  - For 9 of 20 food groups, respondents are **more likely to mention them during 14 phone calls covering 7 days** than during a single 7-day recall interview
  - Respondents are **less likely to mention "other fruits"** during 14 phone calls covering 7 days than during a single recall interview

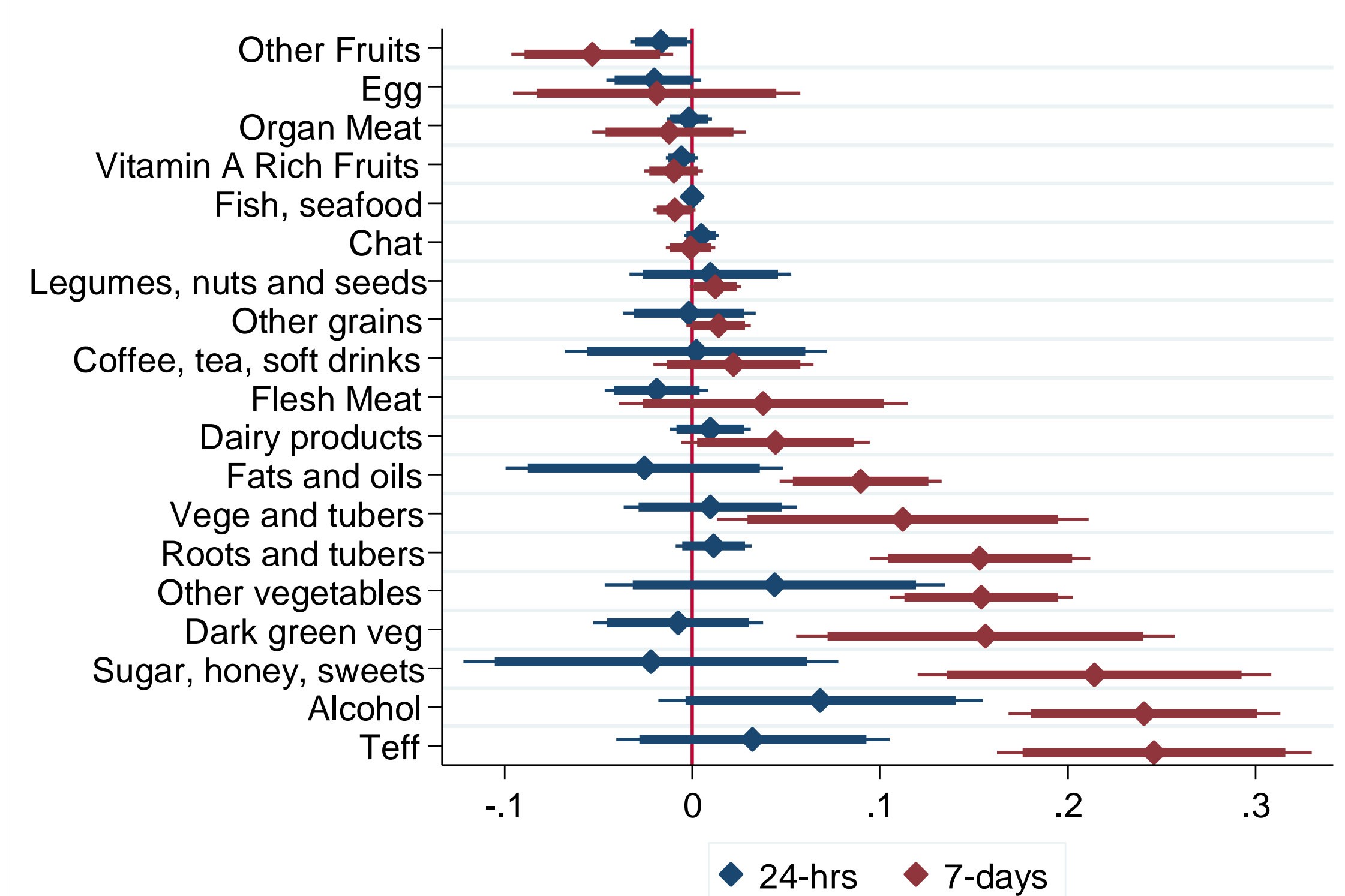


Figure 2. Treatment effect on the probability of reporting each food item.

## Telescoping, Forgetting, & Omitting

- Recalling 7 days of meals is cognitively burdensome
- Frequency of consumption can explain some but not all foods (Fig. 3)
- Items **excluded during 7-day recall surveys** captured by FBR on phone:
  - **Ingredients** used so often they're not noteworthy: **fats and oils**
  - **Infrequently consumed** leafy greens and tubers
  - **Occasional splurges:** alcohol; sugar, honey, and sweets; teff
- Special, high value, infrequently consumed foods can be "telescoped forward"**—brought into the reference period despite having been consumed longer ago: fruits, maybe also meat, fish, eggs

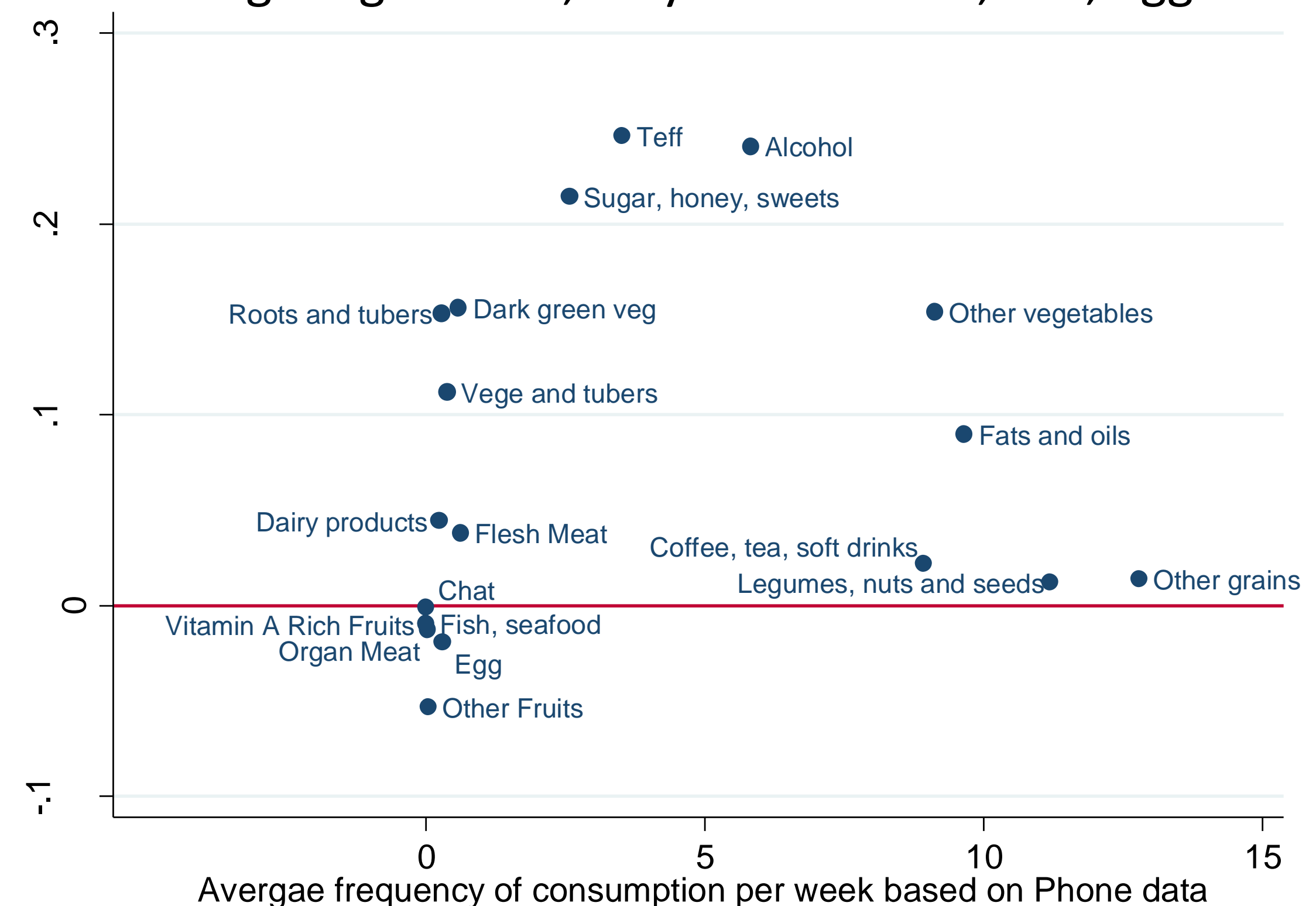


Figure 3. Scatter plot of treatment effects on probability of reporting of each food group vs frequency of consumption per week

## Conclusions & Implications

- We add new experimental evidence that the length of the recall period matters, confirming the cognitive burden respondents face in reporting dietary intake data over a 7-day recall period.
- We shed light on the specific mechanisms (forgetting vs forward telescoping) that contribute to reporting differences between the FBR and SI methods.
- We offer a promising approach to extend respondents' reference periods without exacerbating recall biases, which can help reduce within-person measurement errors of programmatic outcomes such as dietary diversity.

## Contact

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