

Characterizing Non-Sharing with Provisioned Wearables in the All of Us Research Program

Shanshan Song, PhD¹, Oluwabunmi Ogungbe, PhD¹

¹*Johns Hopkins University, Baltimore, Maryland, USA*

Project background

Access disparities in wearable devices limit the representativeness of data in studies employing a bring-your-own-device (BYOD) model. This occurs despite high levels of willingness to share data for research among U.S. adults and leads to analysis inequality. Although researchers often provide devices to address this gap, an intention-action gap may exist.

Research objectives

- We aim to identify factors associated with data non-sharing when devices are provisioned.
- Within a subgroup of participants with prior BYOD experience, we examine how attributes of personal devices relate to non-sharing.

Methods

Study Design: Retrospective Observational Study.

Study Population: Eligible participants were adults enrolled in the NIH All of US' WEAR substudy, which provided wearables while also supporting bring-your-own-device (BYOD) participation. Provisioned devices were defined as Fitbit Charge 4 or Versa 3 with an initial device date on or after consent.

Inclusion Criteria: Participants reported ≥ 1 device version and a corresponding device date.

Outcome: Data non-sharing was defined as failure to share step data for ≥ 1 day using a provisioned device.

Analysis: We examined associations using descriptive statistics and multivariable logistic regression:

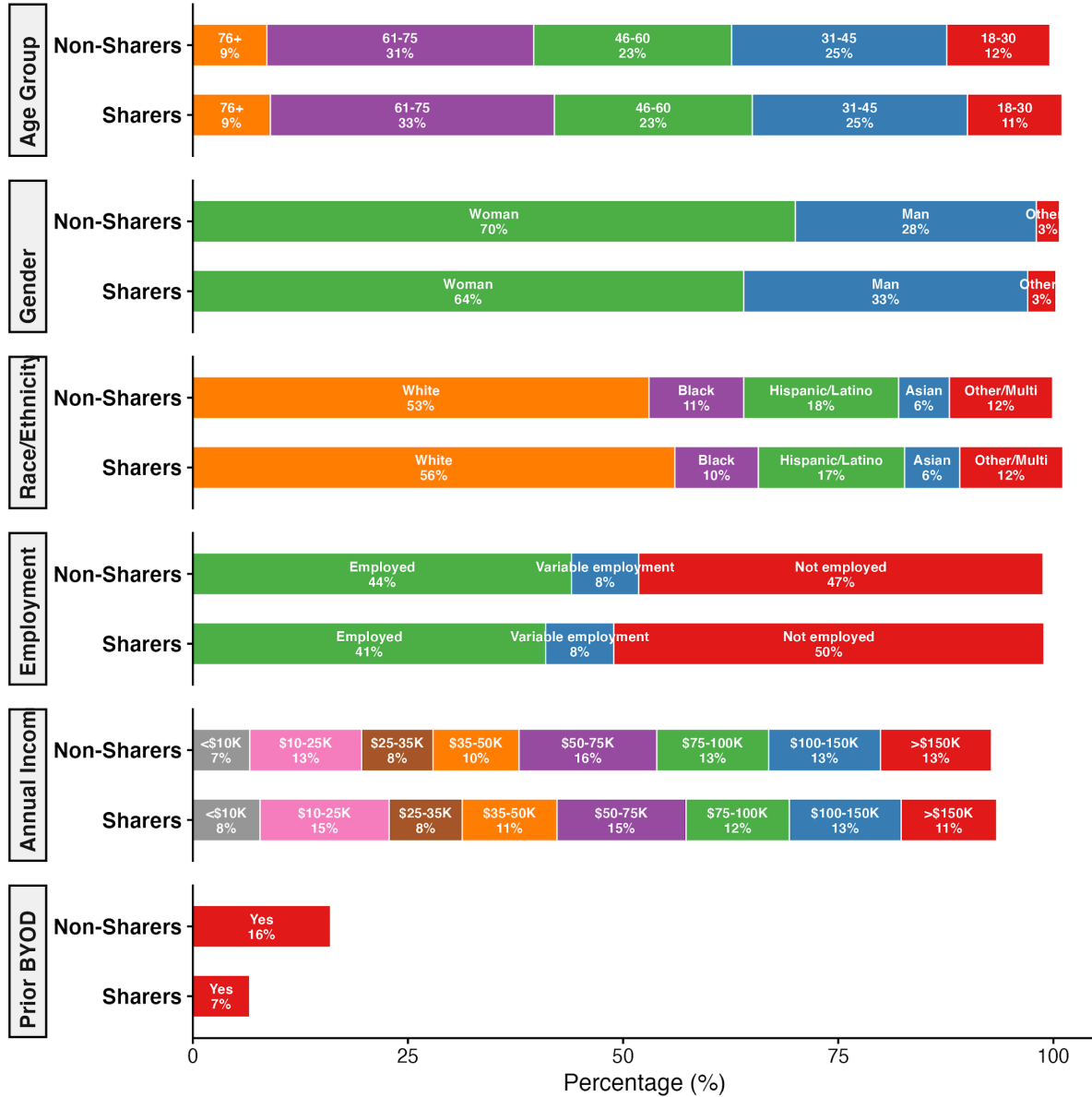
- Primary aim: sociodemographic characteristics and prior BYOD experience \sim non-sharing
- Secondary aim (subgroup with prior BYOD): sociodemographic characteristics and personal device attributes \sim non-sharing

Results

Figure 1a

Characteristics of Participants with Provided Wearables

Provisioned Wearable Data Non-Sharers (n=4,958) vs Sharers (n=26,126)

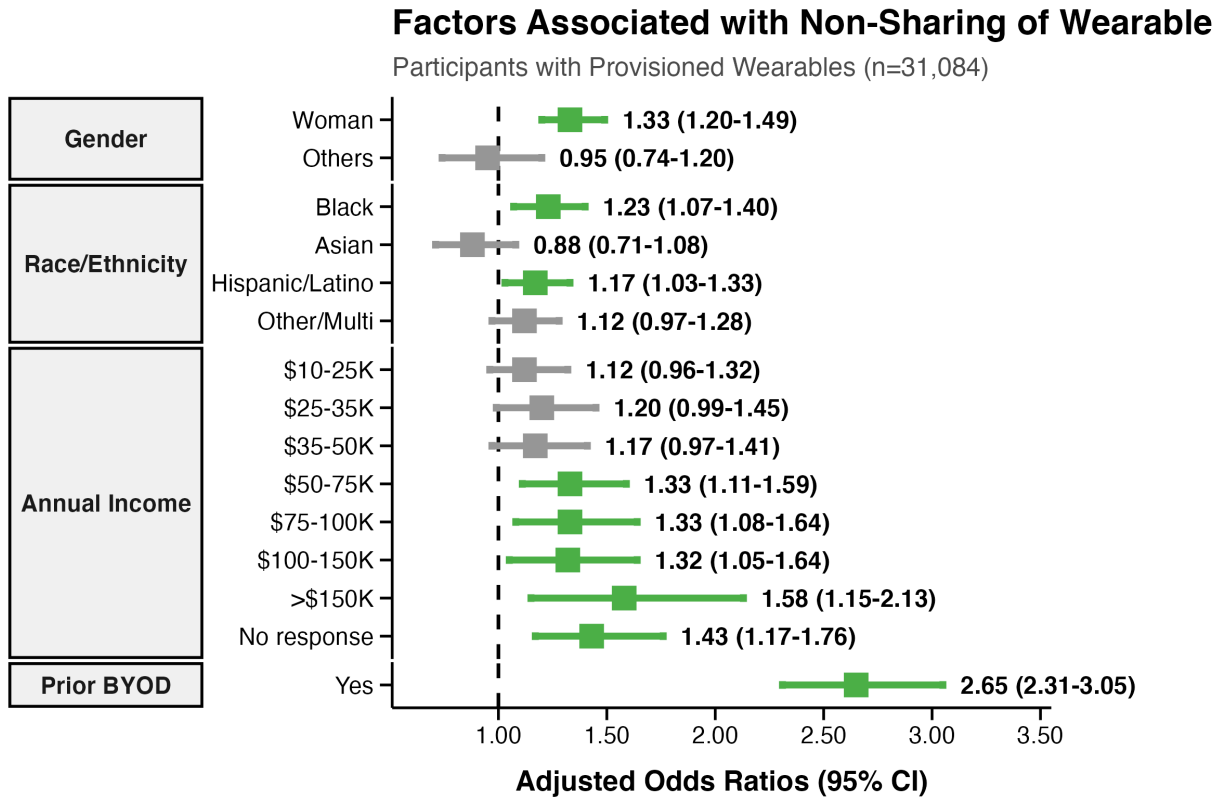


Percentages may sum >100% due to rounding. Missingness is not shown here.

All shown variables had p<0.05.

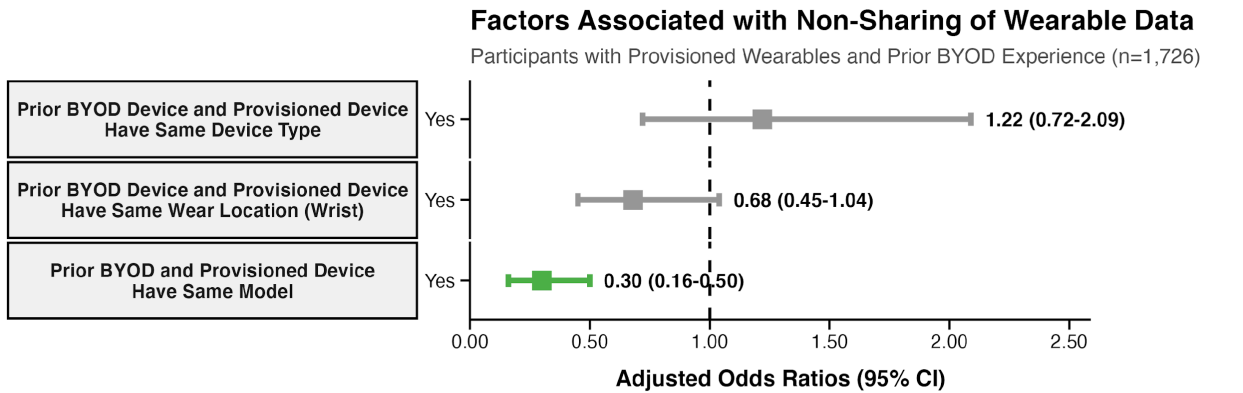
Variables with p≥0.05 (not shown) are: Education, Marital, Health Insurance, Access to Healthcare (Place).

Figure 1b



Green represents $p < 0.05$, grey represents $p \geq 0.05$
 Only variables with at least one category $OR > 1$ and significant are shown. Model is adjusted for :
 Reference categories are: $< \$10K$ (Annual Income), Man (Gender), White (Race/Ethnicity), No (P

Figure 2



Green represents $p < 0.05$, grey represents $p \geq 0.05$
 Only concordance variables are shown. Model is also adjusted for: Age Group, Gender, Race/Ethnicity, Annual
 Reference category is: No (for all concordance variables).

Conclusions/Implications

- Giving out Fitbits did not guarantee data return. 17 % never shared, with lower sharing among women, Black or Hispanic adults, higher-income (> \$50 K) groups, and participants who had already shared using their own devices.
- Familiarity mattered. For those with BYOD experience, participants who already owned the identical Fitbit model were far more likely to share (though based on a small sample size), whereas simply owning other wearables offered no such boost.

Future directions

- Include additional factors (health literacy, technology literacy, and geographic variation) to evaluate their associations with non-sharing.
- Examine the underlying reasons for missing data by refining the outcome using device logs or brief follow-up assessments to distinguish between non-wear, synchronization errors, refusal to upload, privacy restrictions, and temporary interruptions in use.
- Link each identified barrier to evidence-based interventions from the literature (e.g., technical support) and evaluate the effectiveness of these strategies.

Bibliography

1. Holko, Michelle, et al. "Wearable fitness tracker use in federally qualified health center patients: strategies to improve the health of all of us using digital health devices." *NPJ Digital Medicine* 5.1 (2022): 53.
2. Jeong, Hayoung, et al. "Data from the All of Us research program reinforces existence of activity inequality." *npj Digital Medicine* 8.1 (2025): 8.
3. Bailey, Caitlin P., et al. "Fitbit physical activity and sleep data in the all of us research program: data exploration and processing considerations for research." *Medicine and science in sports and exercise* (2025): 10-1249.