

# Improving Adverse Pregnancy Outcomes Using Digital Tools: Real-World Evidence



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## INTRODUCTION

Women with adverse pregnancy outcomes (APOs), such as gestational diabetes mellitus (GDM), face a markedly higher risk of cardiovascular disease. Despite wide use of technology such as smartphones among pregnant women, little implementation of technology has occurred at scale to simplify the management of APOs peri- or post-partum. We evaluated the feasibility of a user-centered mobile app to engage women with GDM after diagnosis by simplifying self-monitoring and providing access to evidence-based educational content.

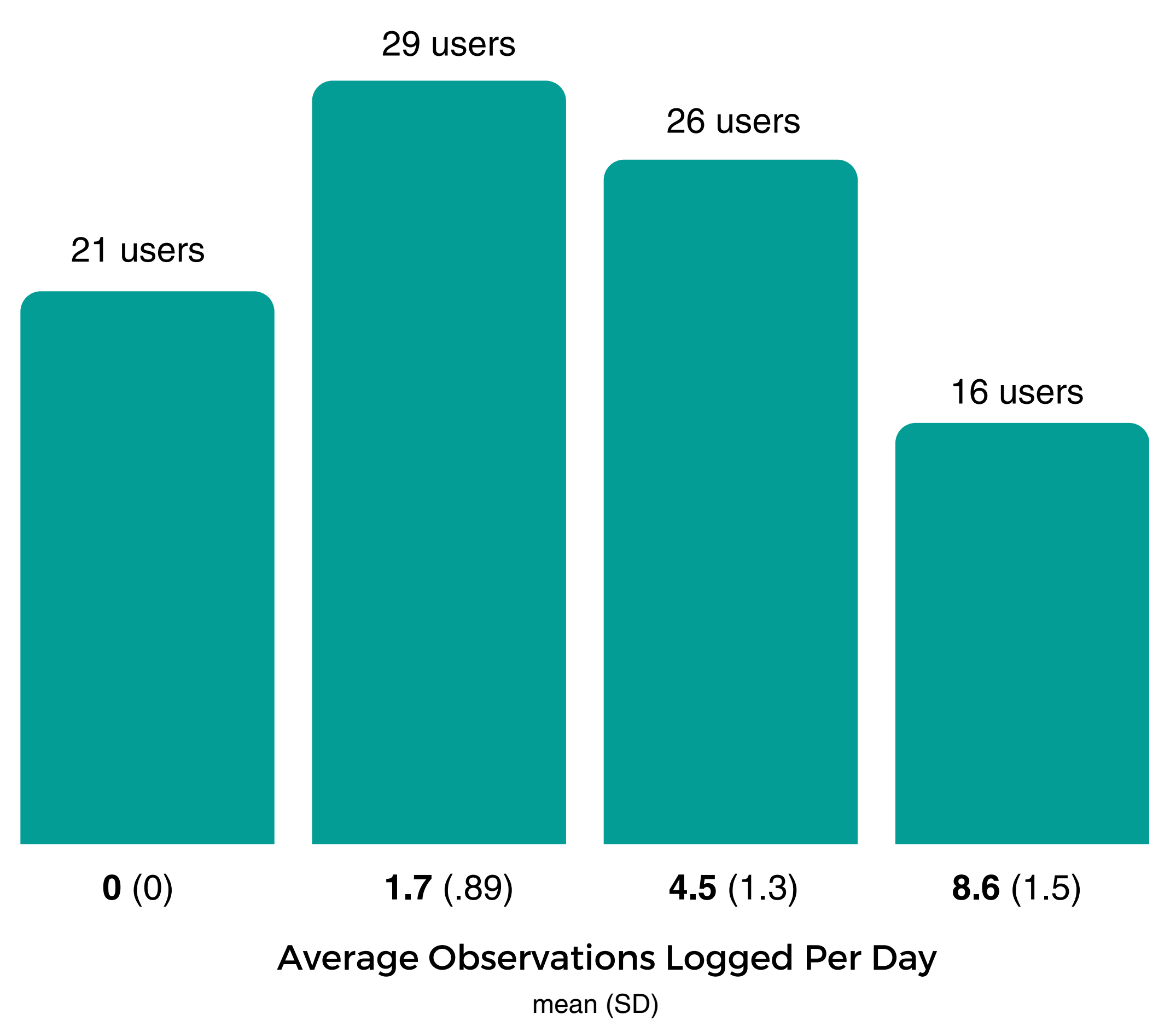
## METHODS

For the initial deployment, we developed an iOS and Android-compatible mobile app accessible in the USA (Devyn, Los Altos, CA) through the App Store or Google Play. Users were referred by clinicians from one of 6 sites or signed up through the app. Users entered self-reported data for glucose, blood pressure, physical activity, weight, and medication intake. Users also tracked food intake using text descriptions and/or food photos. Data on in-app user behavior was used to understand which educational articles or recipes users accessed most often as well as identify opportunities for new features and improvements.

## DEMOGRAPHICS

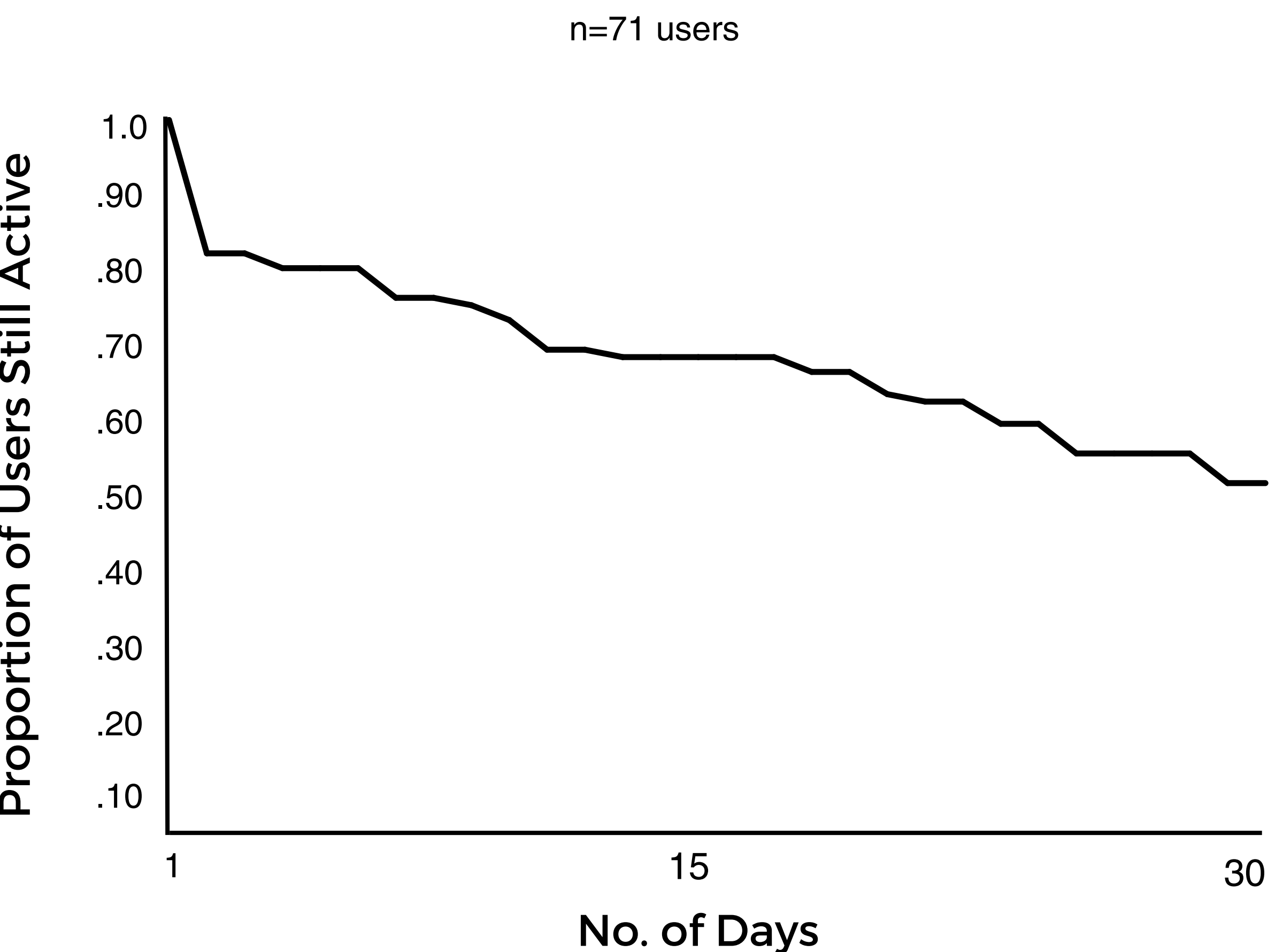
No. of Users Registered (May 2022 to May 2023)	92
<b>Referral Source</b>	
Site-Referred	51%
Direct Signup	49%
<b>Insurance Coverage</b>	
Employer/Commercial Coverage	63%
Medicaid	12%
Other Coverage	25%

## Average Daily Observations



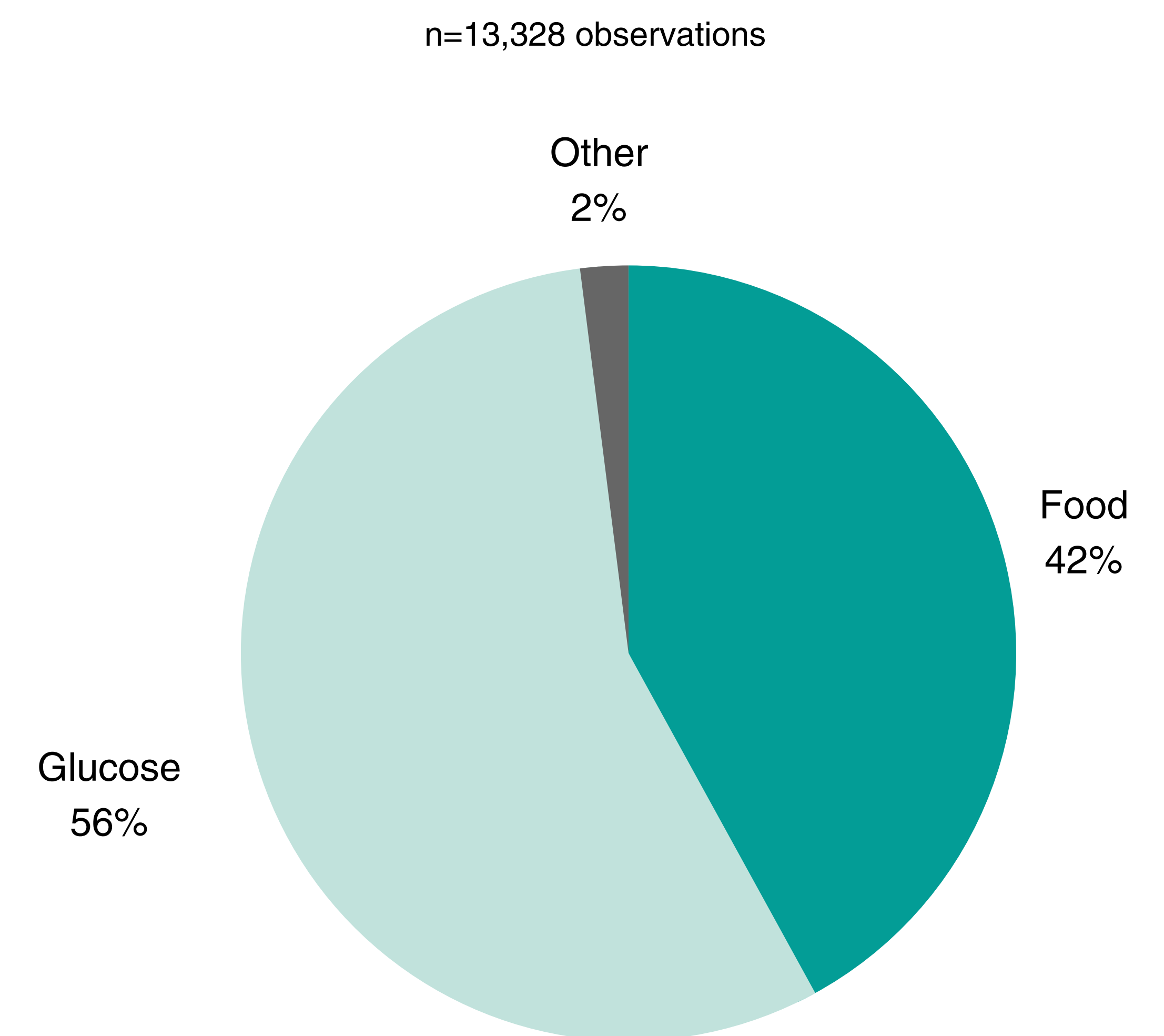
Average daily observations measured by total number of observations logged by user over number of days from first observation logged to last observation logged.

## Active User Analysis

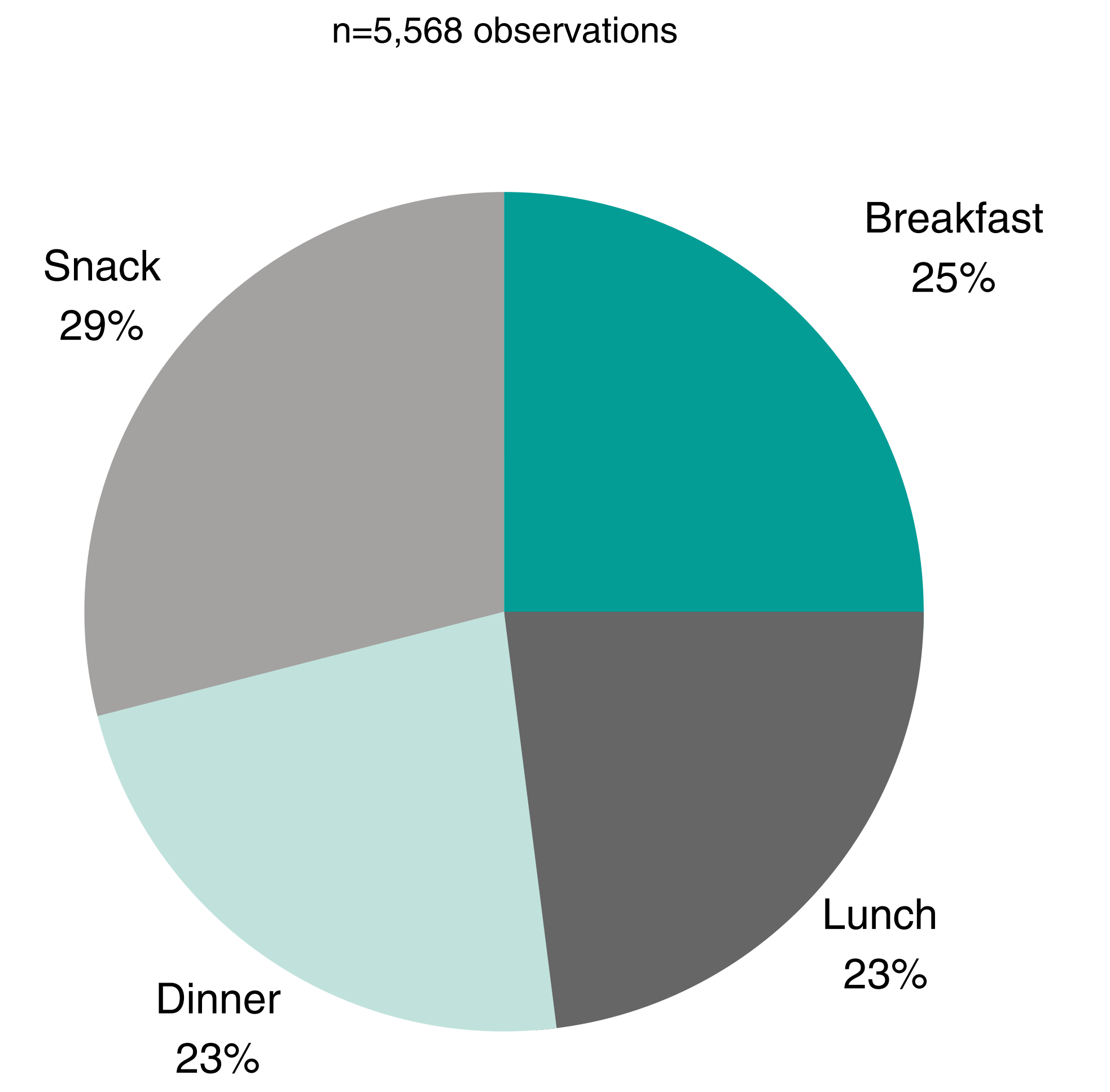


Curve visualizing the dropout of users in the first 30 days. Active users defined as logging on that day or on a later day. Day 1 is when a user logged first observation.

## All Observations by Type



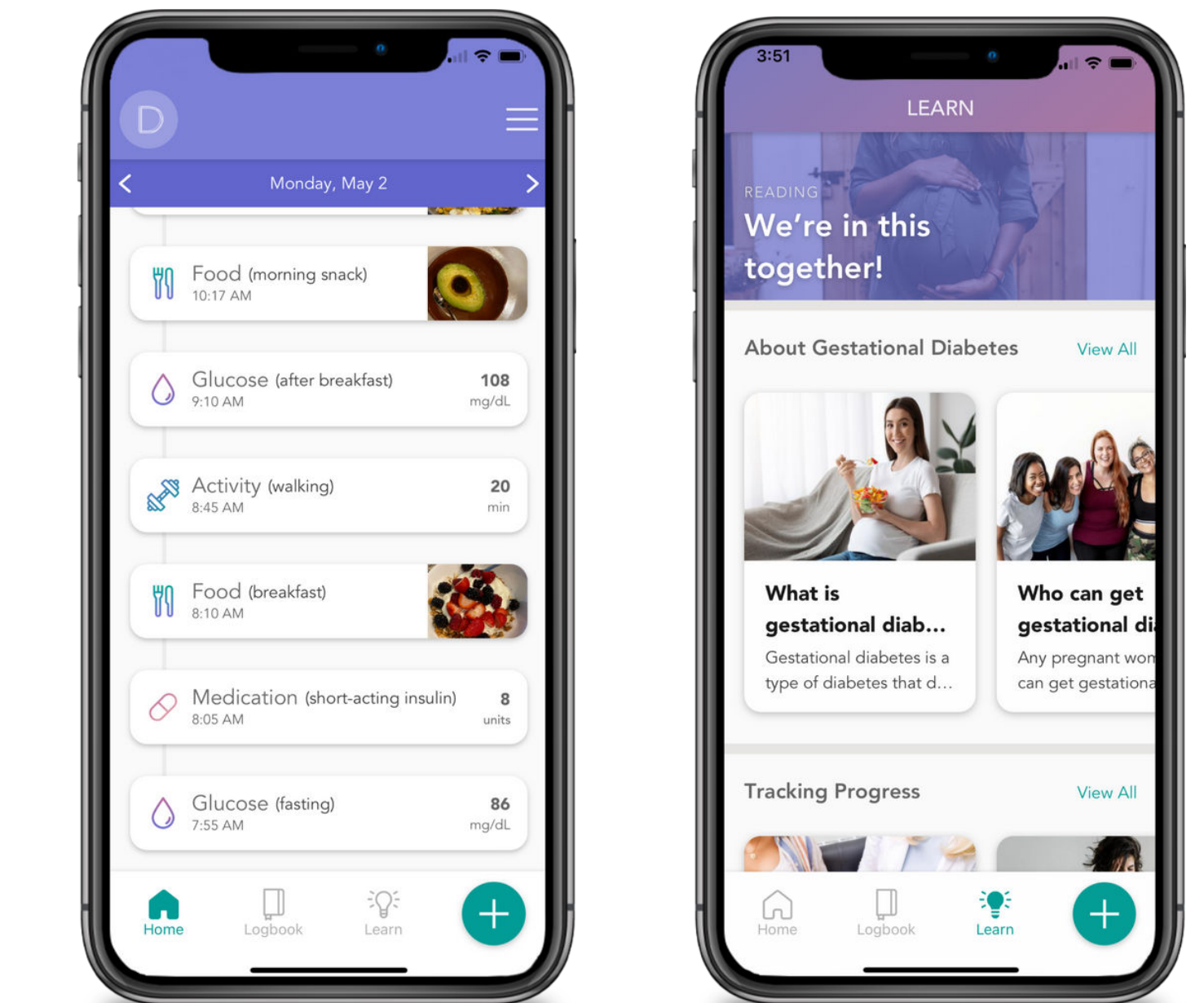
## Food Observations by Type



## Glucose Readings by Type\*

Fasting	After Breakfast	After Lunch	After Dinner
(n=2211)	(n=1697)	(n=1643)	(n=1755)
mean (SD)	mean (SD)	mean (SD)	mean (SD)
<b>92.3 (13.4)</b>	<b>113.3 (21.8)</b>	<b>114.1 (20.1)</b>	<b>117.8 (21.1)</b>
mg/dL	mg/dL	mg/dL	mg/dL

\*Sum of glucose observations above is 7,306: this excludes 148 observations tagged as pre-meal or bedtime glucose and 30 user-error observations.



VIDEO

## CONCLUSIONS

Our data suggests use of smartphone apps in pregnant women with APOs such as GDM is feasible. Smartphone apps provide advantages in accessibility and can provide meaningful data to advance knowledge of APOs, engage patients and assist in transition of care in real-world settings at a much broader scale than single center initiatives. Future research will help determine if this app can decrease complications of GDM.