Previous cycle tracking with a wearable multiparameter device reduces time to conception

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Introduction

- Couples have relied on menstrual cycle tracking to engage in or avoid conceptive sex for centuries.[4]
- Tracking several physiological parameters simultaneously, wearable sensor technology has been shown to detect the fertile window with up to 90% accuracy.[5]
- **Research aim:** To determine if women who cycle track using a wearable device prior to trying to conceive (TTC) become pregnant faster than women who did not cycle track first

Methods

- The Ava Fertility Tracker measures multiple physiological parameters including pulse rate, respiratory rate, skin perfusion, heart rate variability, and skin temperature. It is worn only while asleep and employs a machine learning algorithm in a corresponding smartphone app to predict the user's current and upcoming fertility.
- User chooses from three in-app operational modes: cycle tracking; trying to conceive (TTC); or, pregnancy.
- Retrospective analysis of data from 19,838 American and European women who conceived using the Ava Fertility Tracker (e.g., real-world users)
  - Had to have reported a pregnancy in-app
  - Switched to pregnancy mode for at least 30 days
  - Included only first reported pregnancy
- Compared time to conception for women who used the cycle tracking mode, followed by TTC mode (Prior Cycle Trackers; PCT) to women who started in TTC mode (No Prior Cycle Tracking; NPCT)

Figure 1. Ava Fertility Tracker and its mobile application.

Results

Table 1. Comparison of descriptive statistics between PCT & NPCT women who became pregnant using a wearable fertility tracker

Descriptive Statistics	Prior Cycle Tracking*	No Prior Cycle Tracking*	Covariate regression coefficient (b-value)	*P* value
N	947	19,509	--	--
Time to Conception	104 days (68)	126 days (87)	--	--
Body Mass Index (BMI)	24.45 kg/m^2 (5.28)	25.27 kg/m^2 (5.75)	Underweight (<18 BMI): 9.01 (13.78) Overweight (≥ 25 BMI): 4.53 (5.25)	.513 .388
Age	31.56 years (3.56)	32.07 years (3.88)	≥35 years: 1.13 (9.83)	.909

Note: Mean values reported, with standard deviations or standard errors in parentheses.
*Using the *Ava Fertility Tracker*. No data collected on alternative methods of cycle tracking.

- **Mann-Whitney U-test:** Time to conception significantly shorter for PCT versus NCT (U=7,957,928.00, p<.001)
- **Bootstrap random sampling with replacement** showed significantly shorter time to conception for PCT [95% CI: 99.93, 108.64] versus NCT [95% CI: 125.11, 127.56] women (mean difference=20.42 days, SD=2.29; 95% CI: 17.59, 26.58, p<.001)

Conclusion

- Among real-world users, cycle tracking with a wearable device was associated with shorter time to conception when TTC.
- Planned follow-up analyses will consider how Ava Fertility Tracker's accuracy in predicting the fertile window changes over time for women in the PCT v. NCT groups.

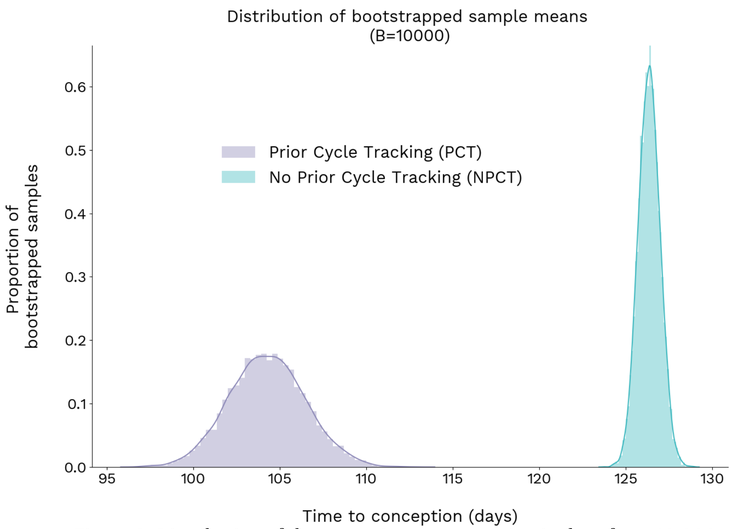

Figure 2. Distribution of the mean time to conception in days from 10,000 bootstrapped samples.

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