June 2, 2020

Dear Editor,

My co-authors and I are pleased to submit our manuscript entitled “Parity is not associated with multiple measures of biological age: Evidence from NHANES 1999-2010” to be considered for publication in *Scientific Reports*.

Understanding factors driving inter-variation in the biological rate of deterioration or repair, known as ‘biological age,’ is of significant public health concern. In women, reproduction entails significant investment and changes across a range of physiological systems. These costs, referred to as ‘costs of reproduction’, may manifest as relationships between parity and cardiovascular disease mortality1, all-cause mortality2, and cellular markers of accelerated aging such as telomere length and DNA methylation patterns3. It is unknown, however, whether parity is associated with previously-validated, clinic-based measures of biological age that predict functional decline and disease, but measure fundamentally different physiological processes than cellular-based measures of biological age.

We tested whether parity was associated with accelerated biological aging using three previously-validated clinic-based measures of biological age (Levine Method, homeostatic dysregulation, and Klemera-Doubal Method biological age) in a nationally-representative sample of women in the US (*n* = 2,669) recruited as part of the National Health and Nutrition Examination Survey. When controlling for covariates related to biological age, we found no significant associations between parity and biological age across all biological age measures in both pre- and post-menopausal women. Associations between time since last birth and biological age were also not significant. Our results suggest that unlike cellular-based measures of biological age, validated clinic-based measures of biological age do not reflect either acute or chronic effects of parity.

We believe our findings will be of general scientific interest, and of interest to those whose work focuses on reproductive epidemiology, evolutionary biology, reproductive physiology, and geroscience. We further believe readers of *Scientific Reports* will find this of interest because of recent papers published in the journal that served as the impetus for our study.

Thank you in advance for your consideration of our article, and we look forward to hearing from you.

Sincerely,

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