

# Letter by Yang et al Regarding Article, "Accelerometer-Measured Physical Activity and Sedentary Behavior in Relation to All-Cause Mortality"

Citation for published version (APA):

Yang, Y., Lynch, B. M., & van Roekel, E. H. (2018). Letter by Yang et al Regarding Article, "Accelerometer-Measured Physical Activity and Sedentary Behavior in Relation to All-Cause Mortality": The Women's Health Study. *Circulation*, *138*(1), 114-115.  
<https://doi.org/10.1161/CIRCULATIONAHA.117.032789>

**Document status and date:**

Published: 03/07/2018

**DOI:**

[10.1161/CIRCULATIONAHA.117.032789](https://doi.org/10.1161/CIRCULATIONAHA.117.032789)

**Document Version:**

Publisher's PDF, also known as Version of record

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## LETTER TO THE EDITOR

### Letter by Yang et al Regarding Article, “Accelerometer-Measured Physical Activity and Sedentary Behavior in Relation to All-Cause Mortality: The Women’s Health Study”

To the Editor:

We read with great interest the recent article by Lee et al,<sup>1</sup> in which the authors examined accelerometer-measured physical activity and sedentary behavior in relation to all-cause mortality, using data from the Women’s Health Study. We raise some methodological concerns.

First, the follow-up time for mortality was limited. Exposure assessment occurred from 2011 to 2015, and participants were followed-up until the end 2015, resulting in a mean follow-up of only 2.3 years. The authors acknowledged the possibility of reverse causation and performed a sensitivity analysis excluding deaths occurring in the first year of follow-up. Typically, sensitivity analyses when examining mortality exclude deaths occurring within 2 years of exposure assessment to account for potential reverse causation. The limited number of deaths (n=207), application of quartile-based exposures, and inclusion of a large number of covariates in the models suggest that these analyses were likely underpowered. We were unable to calculate power for the overall and sensitivity analyses, however, because neither the standard deviation for the accelerometer-derived variables nor the number of deaths within the first year was reported.

Another issue concerns adjustment for confounding. Confounding factors, by definition, are those associated with both the exposure and outcome.<sup>2</sup> Lee et al<sup>1</sup> adjust for covariates, such as hormone therapy, parental history of myocardial infarction, and family history of cancer, whereas the associations with the accelerometer-measured exposure variables are not established or apparent. Further, we suggest that some other covariates included in the models (eg, general health and personal history of cardiovascular disease) may lie on the causal pathway from the exposure to the outcome (ie, be mediators). It has been established that the conventional, nonstructural approach to confounder selection, which includes covariates associated with the outcome of interest without taking the association with the exposure or direction of associations into account, may result in biased estimates.<sup>3</sup>

Lee et al<sup>1</sup> state that their findings do not support increasing light-intensity physical activity or decreasing sedentary behavior for mortality risk reduction, but that further research on other clinical outcomes is needed to fully inform revisions to public health physical activity guidelines. We suggest that the evidence pertaining to light-intensity activity, sedentary behavior, and mortality is neither extensive nor consistent, and that more research on this topic is warranted. For example, the 2 previous studies to examine associations between accelerometer-assessed activity and mortality (note both incorporated longer follow-up and more deaths than Lee et al<sup>1</sup>) found that higher sedentary time was associated with increased mortality after adjustment for moderate to vigorous physical activity.<sup>4,5</sup> The findings from all 3 of these accelerometer-measured activity and mortality studies are

Yi Yang, MPH  
Brigid M. Lynch, PhD  
Eline H. van Roekel, PhD

based on a single period of exposure assessment.<sup>1,4,5</sup> Future research should integrate multiple assessment time points of accelerometer measurement into cohort studies, which will provide further insights into the complex interplay among physical activity, sedentary behavior, potential mediating factors (such as comorbidities), and mortality.

## ARTICLE INFORMATION

### Affiliations

Cancer Epidemiology and Intelligence Division, Cancer Council Victoria, Melbourne, Australia (Y.Y., B.M.L., E.H.v.R.). Melbourne School of Population and Global Health, University of Melbourne, Australia (Y.Y., B.M.L.). Physical Activity Laboratory, Baker Heart and Diabetes Institute, Melbourne, Australia (B.M.L.). Department of Epidemiology, GROW School for Oncology and Developmental Biology, Maastricht University, The Netherlands (E.H.v.R.).

### Disclosures

Ms Yang is supported by a Melbourne Research Scholarship from the University of Melbourne. Dr Lynch is supported by a fellowship from the National Breast

Cancer Foundation (ECF-15-012). Dr van Roekel is supported by an Endeavour Research Fellowship from the Department of Education and Training of the Australian Government (6059-2017).

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