**Author’s covering letter for initial submission**

**Title:** Heritability Estimation of Dichotomous Phenotypes Using a Liability Threshold Model on Ascertained Family-based Samples

**Authors:**

Wonji Kim

*Interdisciplinary Program of Bioinformatics*

*Seoul National University*

Soo Heon Kwak

*Department of Internal Medicine*

*Seoul National University College of Medicine*

Sungho Won¶

*Graduate School of Public Health*

*Seoul National University*

¶Corresponding author ([won1@snu.ac.kr](mailto:won1@snu.ac.kr))

**Version:** 1

**Date:** Nov 21, 2018

**Comments:** This manuscript was submitted to *Genetics* and please see over

Nov 21, 2018

Dear Editor:

Please consider the enclosed manuscript, entitled as “**Heritability Estimation of Dichotomous Phenotypes Using a Liability Threshold Model on Ascertained Family-based Samples**” for publication in *Genetics* journal.

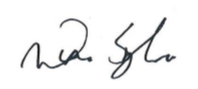
In this study, we proposed a new method for estimating heritability based on the Liability Threshold Model for dichotomous traits. Ascertainment bias due to familial aggregation was successfully adjusted using conditional expectation-maximization algorithm. Our simulation studies showed that heritability estimates obtained with the proposed methods are generally unbiased and efficient for several situations. The proposed method was also applied to ascertained family-based samples from Korean families to estimate the heritability of type-2 diabetes, and those estimates confirmed the practical value of our proposed methods.

This manuscript has not been published or presented elsewhere in part or in entirety and is not under consideration by another journal. We have read and understood your journal’s policies, and we believe that neither the manuscript nor the study violates any of these. There are no conflicts of interest to declare.

We believe that your journal readers will be interested in. Through publication in *Genetics*, we hope to provide a new approach estimating heritability on ascertained family-based samples for various diseases.

Thank you for your consideration. I look forward to hearing from you.

Sincerely yours,



Sungho Won, Ph.D.

Assistant Professor of Biostatistics,

Department of Public Health Science

Seoul National University