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Respiratory and Immunology Project at Larkin Research Team
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Regression Models on a Meta-Data to Identify Variables Confounding with Endotoxin Exposure in Contributing to Wheezing Risks among Animal Laboratory Workers

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Introduction

Endotoxin is a constituent of the outer membrane of Gram-negative bacteria, and a frequent contaminant in workplaces dealing with laboratory animals. Studies have found that exposure to endotoxin in the laboratory setting could increased the risk of wheezing among subjects suffering from asthma. However, it is not clear if other pre-existing predictors of exposed individuals increase the risk of wheezing in animal laboratory settings.

Objective

- To implement regression models on a publicly-available meta-data to identify variables potentially confounding with endotoxin exposure to increase asthma exacerbations among laboratory animal workers.

Methods

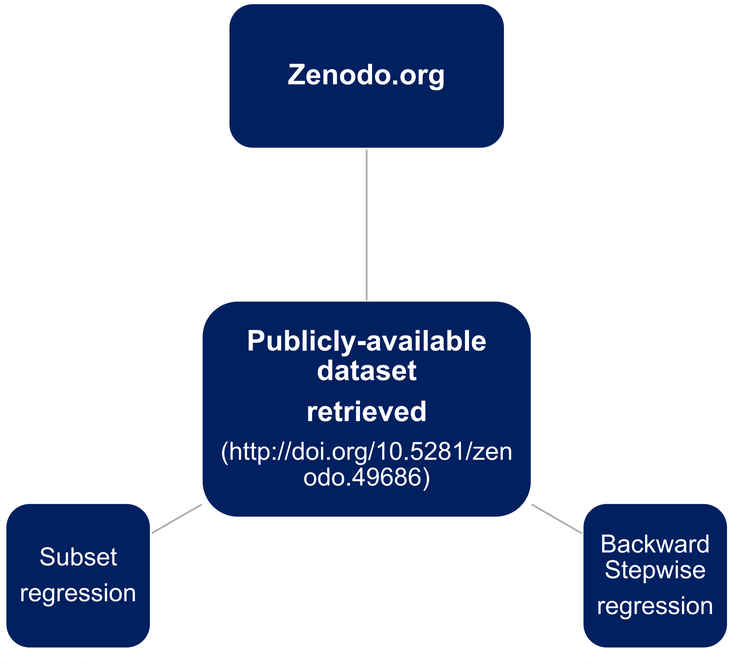

Figure 1: The publicly-available dataset was identified and retrieved from Zenodo.org platform, which was part of a published study by Souza et al. (BMC Pulmonary Medicine 2016.)

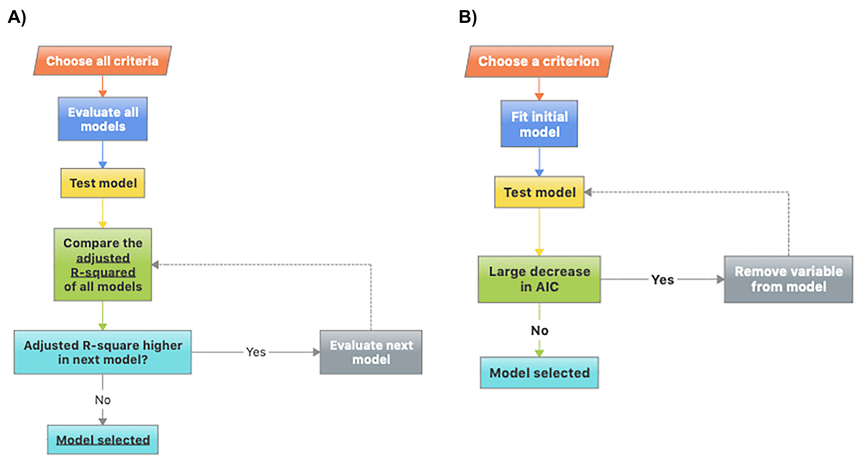

Figure 2. Regression models: A) Subset regression, B) Backward stepwise regression.

Results

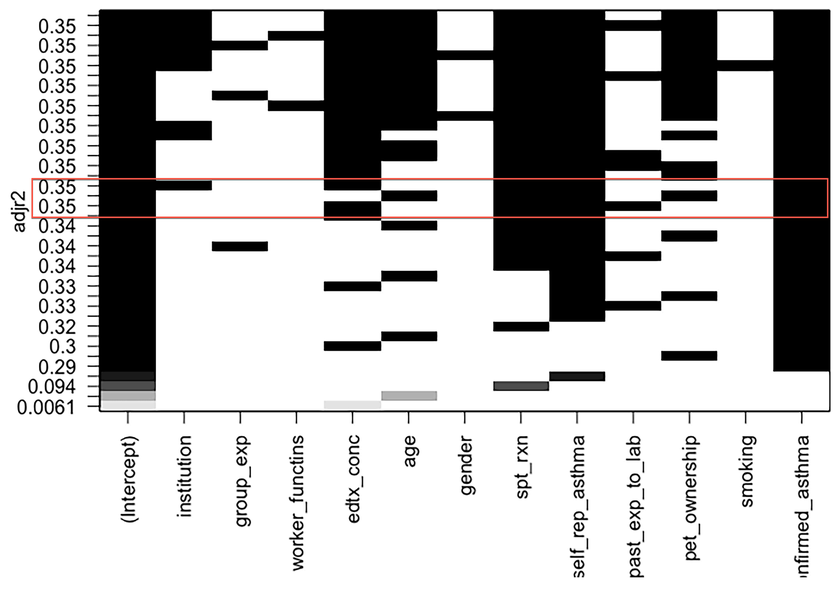

Figure 3. The output of the subset regression (red rectangle) identified a) confirm asthma, b) self-reported asthma, c) pet-ownership, d) age, and e) skin-prick test to confound with endotoxin concentration in risk of wheezing among laboratory workers.

Regression model as identified by subset regression and further evaluated with backwards stepwise regression (Fig 4):

Wheezing ~ endotoxin concentration + confirmed asthma + self reported asthma + SPT reactivity + Pet ownership + Age

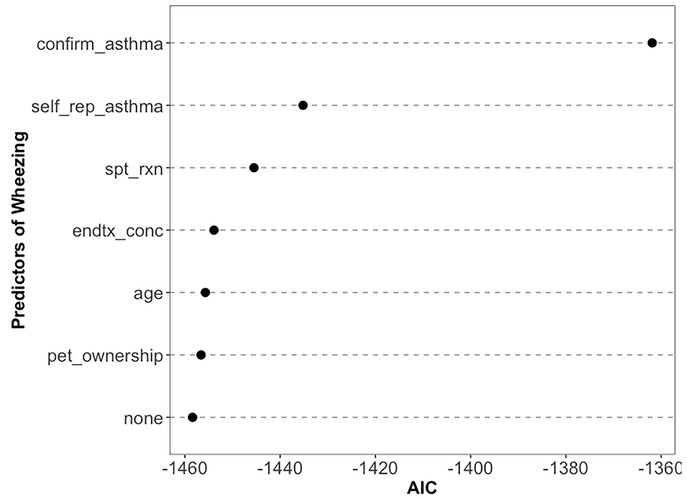

Figure 4. The output of the subset regression (red rectangle) identified confirm and self-reported asthma, pet-ownership, age, and skin-prick test to confound with endotoxin concentration in risk of wheezing among laboratory workers.

Conclusion

- Our findings suggests that endotoxin exposure, together with the immune status, such as IgE-reactivity, of the laboratory workers with confirmed or self-reported asthma status at higher risk of wheezing.

Future Studies

Future studies will,

- implement assess the risk of wheezing among laboratory workers in non-animal lab research settings.
- Deploy occupational health studies in laboratory settings to identify other pollutants of biological and non-biological origins in

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Conflict of Interest

- The authors have no conflict of interest to disclose.