Understanding the genetic and causal relationship between common health outcomes and mortality.

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Abstract

Inferring true causal relationships in epidemiology is notoriously challenging. Still, the benefits that can be reaped from finding methods that can infer such associations are vast (Smith and Hemani, 2014). Indeed, to be able to identify diseases that have a direct causal relationship with an outcome such as mortality, would aid in the development of treatment and prevention of illness.

This thesis concerns finding correlation and causal relationships between common health outcomes and mortality. The LD score regression (LDSC) method was used to compute genetic correlations for diseases such as coronary artery disease, schizophrenia and smoking behaviour etc. with mortality. Additionally, causal inference analysis was performed using the Mendelian Randomisation (MR) software GSMR on the same traits as with LDSC. Additionally, the Latent Causal Variable (LCV) method was used as a comparative measure to GSMR and LDSC. This gave varying results, as each software tended to identify different traits to be in association with mortality. This can have been a consequence of the limitations of the data and confounding.