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Further Development and Validation of the electronic Frailty Index using the Secure Anonymised Information Linkage Databank

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Introduction

Aging populations with increasing frailty have major implications for health services internationally, and evidence-based treatment becomes increasingly important. The development of an electronic Frailty Index (eFI) using routine primary care data facilitates implementation of evidence-based interventions. However, the eFI does not account for time restrictions regarding when information was recorded.

Objectives and Approach

Our aim is to implement and further validate the eFI using the Secure Anonymised Information Linkage (SAIL) databank, introducing refinements based on time restrictions.

Our implementation of the eFI identifies frailty based on 1574 Read codes, which are mapped amongst 36 categories known as deficits. The eFI is based on the internationally established cumulative deficit model, and each deficit contributes equally to the eFI value.

However, although each deficit is equally weighted, only one of them is currently time dependent. We therefore analyse the time at which each deficit is identified, and propose time dependent cut-points based on our findings.

Results

We were able to successfully implement the eFI using data from over 400,000 individuals from the Welsh population using data held in the SAIL databank. Our results agree with the baseline characteristics and distributions of frailty found in the original development of the eFI.

We also found that the percentage of individuals identified as frail increased as the number of years of records included was increased. Furthermore, the increase in percentage year by year was almost linear for a number of the deficits. This led to the identification of time bounds for particular deficits, which could help to refine future implementations of the eFI.

Conclusion/Implications

Our work validates and refines the eFI, which is a particularly useful resource as it uses existing primary care data to identify frailty, meaning no additional resources are required. Furthermore, our implementation is readily available, meaning that future research related to frailty is easily reproducible and achievable by others.