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Project: Pilot study - developing a frailty scale from the interRAI

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Introduction:
Frailty is hard to quantify, there is no solitary definition which is able to define frailty. At some point in older adult's lives, they become frail. This frailty is present among a group of people who are usually associated with co-morbidities, disability, and self-rated health; and this can indicate the group of people who are most exposed to adverse outcomes. When characterising a frail person, both psychological and physical deterioration are considered. In this pilot study, the international residential assessment instrument (interRAI) home care assessment was used to analyse the status of older people. InterRAI is a standardised national older person's assessment which collects information on a broad range of variables. As of December 2014 60,145 community assessments had been performed in New Zealand. There is hope that integrating a frailty measure into the standardised assessment could help with clinical judgement and administration when distributing the health budget, without any additional burdens on the individuals.

Aim:
To derive a frailty index (FI) for New Zealand from the collected interRAI, to determine if it can be used as a predictor of adverse outcomes such as admission into residential care and mortality.

Method:
For this study, 5657 older people from the CDHB were analysed based upon their interRAI assessment. 5580 (99%) of these patients were 65 years and older. The interRAI assessments were taken between April 2007 and September 2013. We have a follow-up period of up to 5 years. Mortality and residential care admissions has been matched to the data, along with the CHESS and MAPLe scores, which are predictors of mortality and residential care admissions respectively. Kaplan meier curves have been used to look at the relationships between CHESS scores and mortality as well as MAPLe scores and admission to residential care.

The inerRAI collects information on a broad range of variables, such as comorbidities, function, and activities of daily living (ADL). Not all of the variables in the assessment are relevant to developing a frailty score, and so only some variables that met a criteria of the frailty definition were selected. Once the variables were selected they were then recoded into deficits, with cut-offs for each deficit determined through repeated analysis. The process was more complex for some questions than for others due to the different scales each item is assessed by. The assessment has variables recorded on binary, ordinal and continuous scales; for example, mobility is recorded on an ordinal scale from 0 to 8, whereas memory is recorded on a binary scale of 0 = okay or 1 = memory problem, thus each variable was recoded differently. The optimal number of deficits was determined (62) and individual patient frailty

scores were calculated by summing the number of deficits for each individual, divided by the total number of deficits considered (62).

Each patient had a frailty score between 0 and 1. The distribution of the frailty index was assessed as well as the appropriateness of using the Frailty index as a predictor of residential care admissions as well as mortality. The frailty score was grouped on a scale of 0 through 5, where 0 was the least frail, while 5 was the most frail.

Results:
It was found that the frailty index approximately normally distributed with a mean of 0.27 (±0.17). The frailty index was found to be a very good predictor of admissions into residential care, almost as good as MAPLe scores. There was a great difference between frailty index 0 and frailty index 5. For FI 0, 10% of this group would have been admitted into residential care, while after 5 years 30% would have. Whereas, for FI 5, after 1 year 45% of this group are predicted to have been admitted into residential care, while after 5 years, 65% would have.

The frailty index was found to be a good predictor of mortality, although not quite as good as the CHESS score. Again there was a great difference between FI 0 and FI 5. After 1 year, there was a mortality rate of 15% and after 5 years 45%. While FI 5 had a mortality rate of 40% after 1 year and greater than 90% after 5 years. The FI scores are able to separate the people who are at the greatest risk of adverse outcomes.

Conclusion:
After producing a frailty score from the interRAI data, the frailty index was compared with existing CHESS and MAPLe scores. These scores are both very good independent predictors of one outcome, using few questions from the interRAI. Whereas, the frailty index is derived from many variables, including those used in CHESS and MAPLe scores, and thus is able to predict both mortality and residential care admissions from the one scale. The frailty index has a 5 year follow up and therefore can predict up to 5 years ahead, thus it is a better long term predictor.