

'Value add': Using ICHOM standard oncology datasets to determine a frailty index and improve outcomes

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Frailty is common in older adults,¹ and is of particular importance in cancer given the ageing profile of these patients, and that both cancer and its treatment are significant stressors on a person's physiologic, and social, reserve.²⁻⁴

Identification and quantification of frailty with a frailty index can facilitate greater individualisation of cancer care to achieve improved patient-centred outcomes. Whilst advanced frailty is likely to be easily identified by clinicians, mild frailty and vulnerability may well be overlooked, yet these patients have increased susceptibility to adverse outcomes. Incorporation of geriatric assessments into cancer management has been demonstrated to decrease treatment toxicity and improve treatment completion and patient-centred outcomes.⁵⁻⁸

Collaboration with the Continuous Improvement in Care – Cancer (CIC Cancer)^{8,9} research project allowed access to electronic capture of data that could provide a frailty index for cancer patients in a major metropolitan hospital site within Western Australia.

Results...

- Patients were classified as mildly frail, on average, with frailty index scores ranging from 0.00 to 0.58 (mean 0.16 - standard deviation 0.12) and approximating a gamma distribution (Figure 1).
- Each year of patient age was associated with a small but significant increase in frailty index scores (0.001 points, $p = 0.045$).
- Among patients with lung cancer or colorectal cancer, women had significantly higher frailty index scores than men (mean difference 0.06, $p = 0.006$).
- Over 934 person-years of follow-up including 51 deaths, the mortality risk was substantially elevated (HR 3.77 [95% confidence interval 2.11– 6.76], $p < .001$) in patients with higher degrees of frailty (frailty index scores > 0.20) compared to patients with lower degrees of frailty (scores ≤ 0.20) (Figure 2).
- That association remained statistically significant following adjustment for patient age, sex and cancer type (HR 2.04 [95% confidence interval 1.11–3.74], $p = 0.022$).
- These properties – including being positively associated with age, higher in women, and associated with mortality – support the validity of the frailty index.

In conclusion...

Value-adding to data collected via the ICHOM standard dataset can effectively determine the frailty level of older adults undergoing cancer treatment. This can allow tailoring of cancer treatment recommendations to improve outcomes and identify those who may benefit from more detailed assessment and interventions.

To test this, a pilot will be implemented to determine if implementation of a collaborative nurse-led geriatric assessment and intervention model of care for patients who are frail can improve clinical and patient-centred outcomes, whilst being cost effective.

Methodology...

Using the bespoke CIC Cancer informatics system, the EORTC-QLQ-C30, comorbidities, and date of death within the ICHOM standard dataset, we developed and validated a 42-item frailty index in oncology outpatients diagnosed with lung (n - 99), colorectal (n - 62), and breast (n - 357) cancer. Age-related health and functional deficits were first coded from 0 (deficit absent) to 1 (full expression of deficit), after which frailty index scores were calculated for each patient by dividing the number of deficits by the total number assessed. We then assessed the baseline prevalence of frailty, explored differences in frailty index scores by age and sex, and determined the association of frailty index scores with mortality. We used multiple linear regression and Cox proportional-hazards models adjusted for age, sex, and cancer type, as appropriate.

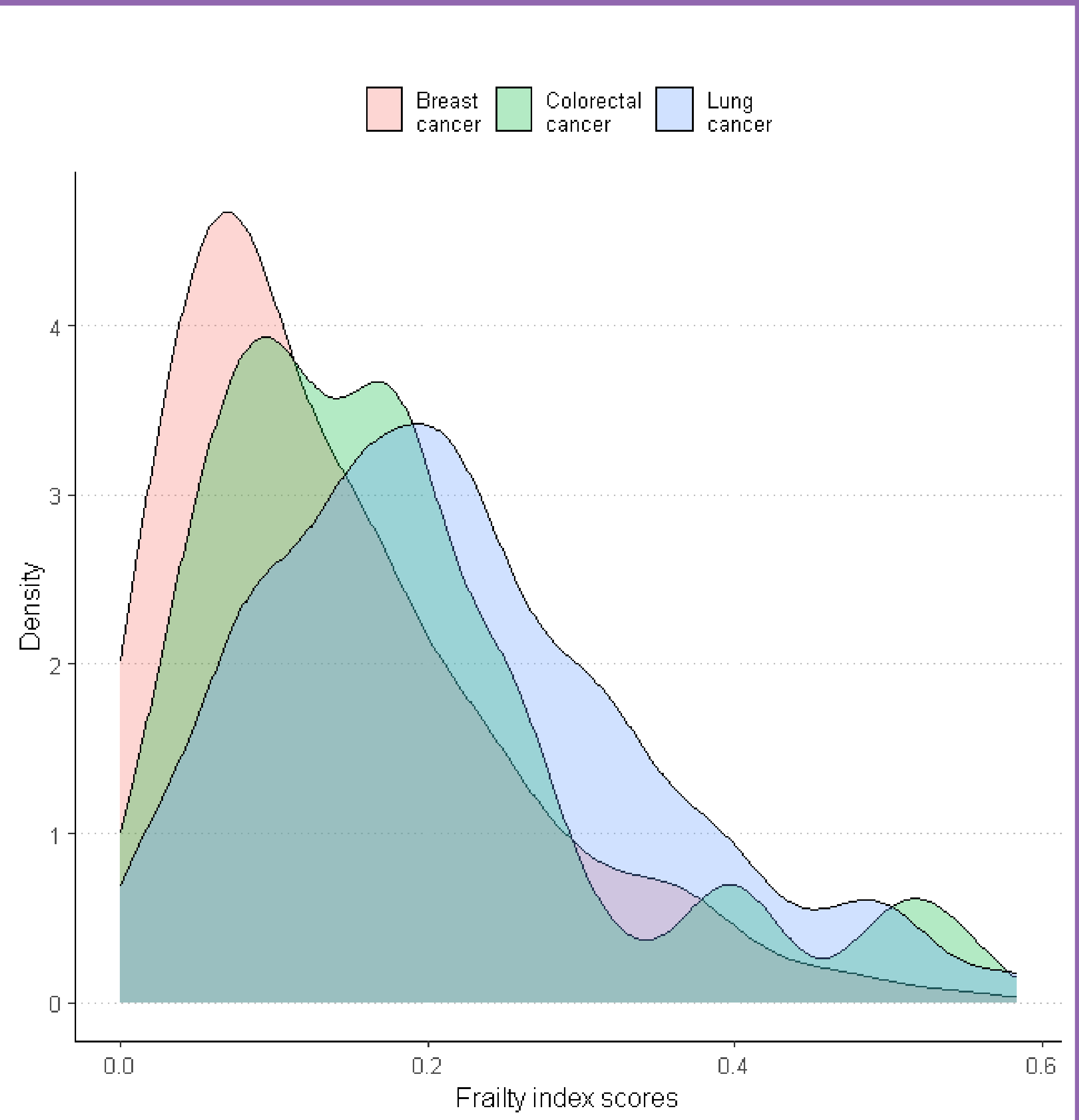


Figure 1. Distribution of frailty index scores

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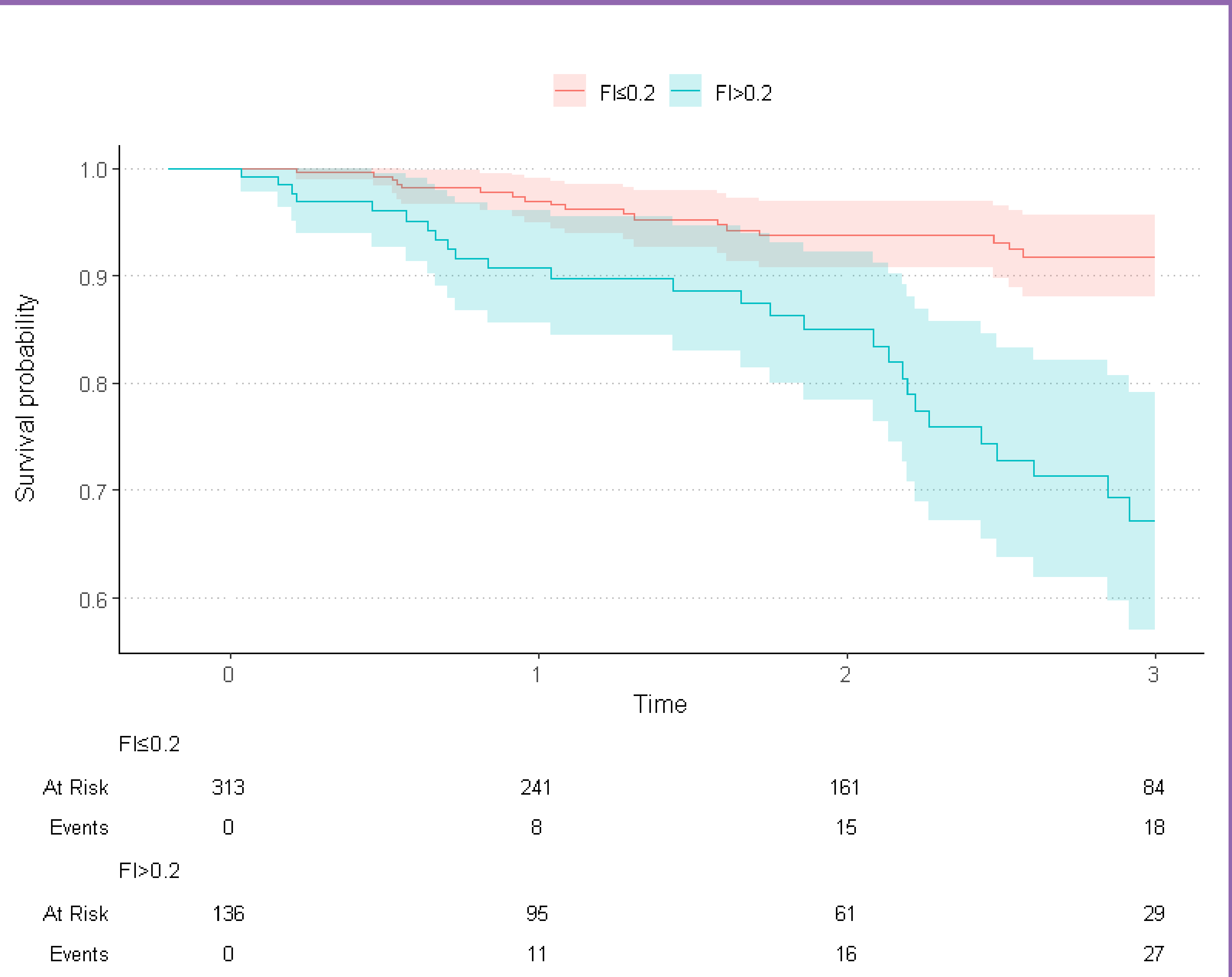


Figure 2. Survival stratified by frailty group

