Author's reply

We thank John Soong and colleagues, Sandra M Shi and colleagues, and Rónán O'Caoimh and colleagues for their careful consideration of our Article.

We note some concerns about the clinical utility of our scoring method; our approach is to position the Hospital Frailty Risk Score (HFRS) as a tool that can be implemented without the need for additional assessment or data collection, and direct high-risk individuals towards frailty-attuned interventions, such as the Comprehensive Geriatric Assessment (CGA).[1] We acknowledge that the HFRS can only be generated after an initial admission, so risk stratification information would not be possible at first presentation. Two-thirds of people aged 75 years old or older access acute-care hospitals more than once over a 2-year period, and those patients who have not previously accessed hospital care are typically at low risk of hospital-related adverse outcomes; thus, we view the HFRS as being especially useful to identify individuals at the highest risk of hospital-related harm and resource use. We accept that manual scales, such as the Clinical Frailty Scale,[2] could be used, but the HFRS has the advantage of being automated and capturing all patients, not just a selected sample.

Shi and colleagues commented on the restricted discriminant ability of the HFRS; however, none of the existing frailty scales have sufficient discrimination to be able to recommend individual patient care.[3] The HFRS is particularly useful for estimating prevalence of frailty and outcomes.

We note the suggestion to analyse elective and non-elective care

separately, and we agree that future iterations could focus on one or more specific areas within the hospital, and incorporate other data sources, such as physiological scores, medication, and data from primary care. During our work, we identified other clusters, which are described in table 2 of our original Comment. These clusters merit further exploration, particularly the cardiovascular and cancer clusters, in which frailty was also prevalent.

O'Caoimh and colleagues questioned whether CGA could be used at scale for frail older people in acute-care hospitals. This possibility is unproven, but strong research evidence base supports the benefits of CGA, and growing evidence shows the feasibility of implementing CGA at scale in the context of urgent care.[4,5] We hope that the HFRS might help to target scarce resources to those patients most likely to benefit from it.

We declare no competing interests.

Simon Conroy, Thomas Gilbert, Andrew Street, Helen C Roberts, Stuart Parker
spc3@le.ac.uk

Department of Health Sciences, University of Leicester, Leicester, UK (SC); Service de Médicin Gériatre, Centre Hospitalier Lyon Sud, Pierre-Bénite, France (TG); Department of Health Policy, London School of Economics and Political Science, London, UK (AS); **[A: any specific department?]** Faculty of Medicine, University of Southampton, Southampton, UK (HCR); and **[A: please indicate department]** University of Newcastle, Newcastle upon Tyne, UK (SP)

1 Ellis G, Gardner M, Tsiachristas A, et al. Comprehensive geriatric assessment for older adults admitted to hospital. *Cochrane Database Syst Rev* 2017; **9:** CD006211.
2 Rockwood K, Song X, MacKnight C, et al. A global clinical measure of fitness and frailty in elderly people. *CMAJ* 2005; **173:** 489–95.
3 Carpenter CR, Shelton E, Fowler S, et al. Risk factors and screening instruments to predict adverse outcomes for undifferentiated older emergency department patients: a systematic review and meta-analysis. *Acad Emerg Med* 2015; **22:** 1–21.
4 Conroy SP, Ansari K, Williams M, Laithwaite E, Teasdale B, Dawson J. A controlled evaluation

of comprehensive geriatric assessment in the emergency department: the 'emergency frailty unit'. *Age Ageing* 2014; **43:** 109–14.

5 Rumley-Buss A, Thompson D, Gladman J, et al. Improving acute care for older people at scale–the Acute Frailty Network. *Acute Med* 2016; **15:** 165–220.