



How Do Ratings Add Up?



Rowena Jacobs
York



Maria Goddard
York



Peter C. Smith
Imperial College, London

Background

Greater emphasis on ranking the performance of public sector organisations, particularly in England, has been reflected in new local government, school and health service league tables, as well as international league tables. Even when it is not directly linked to funding, league table position can have major implications; for example, wholesale changes in leadership. But what we do not know is how far rankings based on composite indices (constructed by adding a range of different performance indicators together) reflect random variation, measurement error or real differences in performance, and how far ranking scores are sensitive to small changes in aggregation method.

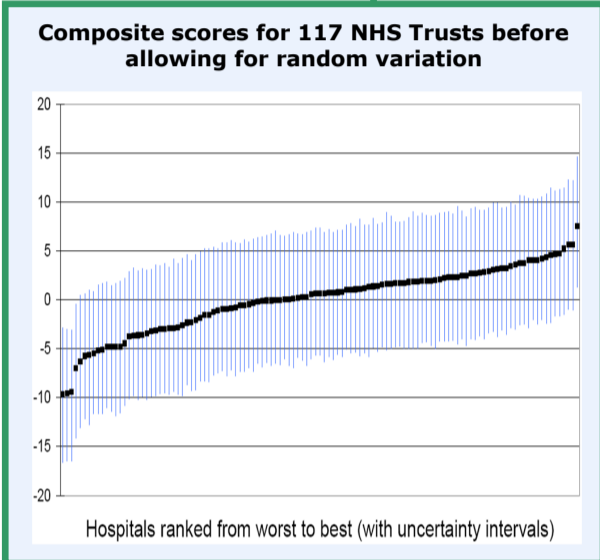


Figure 1

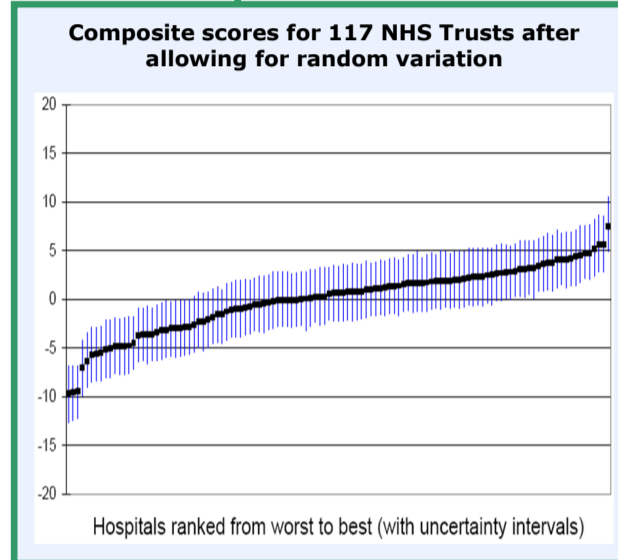


Figure 2

What We Did

- ❖ We produced scaled-down versions of the main composite measures in England: star ratings for hospital trusts and the Comprehensive Performance Assessment (CPA) for local authorities. The composite for 117 NHS hospital trusts consisted of 10 indicators from the star ratings and the composite for 97 local authorities drew on 35 indicators from the CPA.
- ❖ To assess the extent of uncertainty in performance indicators making up a composite, we used the 'Monte Carlo' method, involving 1000 repetitive sampling operations for each performance indicator.
- ❖ We tested these composite scores for their sensitivity to random variation, uncertainty and alternative aggregation rules, including changes in weightings.

Aims

We aimed to test the robustness of rankings created from composite performance measures by investigating the performance indicators that go together to form a composite measure, to discover:

- ❖ how far random variation in measuring the underlying performance indicators affects the composite score;
- ❖ how much uncertainty surrounds the composite indicator;
- ❖ how far changes in weightings of the various performance indicators that are added together to form the composite score affect the relative positions of the organisations being ranked.

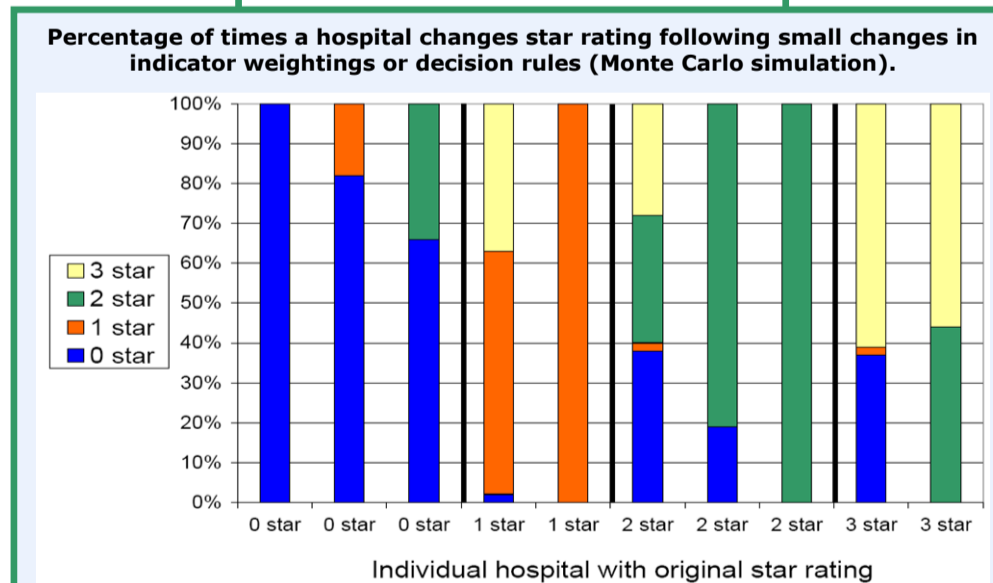


Figure 3

Findings

- ❖ We found changes in aggregation methods (either altering weightings or decision rules) could have a substantial impact on results, with individual hospitals jumping from a 0-star rating to a 3-star rating dependent on small alterations in the aggregation rules (see Figure 3). We obtained similar results for local authority CPA ratings.
- ❖ Our methods indicate how uncertainty shrinks if we take account of random variation on performance indicators (Figures 1 and 2).
- ❖ Accordingly, if composite performance measures remain popular it is important that they are published with indications of uncertainty.

Find out more...

