S2 Understanding the Brier Score

The performance of the respondent on each vignette was determined by calculating the "Brier score" (27). The Brier score (BS) is calculated using the following formula:

$$Brier\ score\ =\ (f_t\ -\ o_t)^2$$

In which f_t represents the percentage response from the clinician, o_t represents the outcome of the patient (0 = did not occur, 1= did occur). The Brier score takes in to account the outcome of the event predicted as well as the estimate. Brier scores range between 0 and 1. A score of 0 represents perfect accuracy and a score of 1 represents perfect inaccuracy.

Example of the Brier score

If a participant predicted a 70% probability of dying within 72 hours, and the patient did in fact die within that timescale, then they would have a Brier score of $(0.70\text{-}1)^2 = 0.09$. In this example, the outcome event occurred (coded as 1), and is deducted from the percentage probability; the result is then squared. The low Brier score indicates that this prediction was relatively accurate.

If, in contrast, the participant predicted an 80% probability of dying within 72 hours, and the patient did not in fact die within that timeframe, then they would have scored $(0.80\text{-}0)^2 = 0.64$. In this case the outcome event did not occur (coded as 0), and is deducted from the percentage probability; the result is squared. The high Brier score indicates that this prediction was relatively inaccurate.

Finally, if the participant had predicted a 50% probability of dying within 72 hours then regardless of whether or not the patient died, the Brier score would be $(0.50\text{-}0)^2 = 0.25$ or $(0.50\text{-}1)^2 = 0.25$. In each case a Brier score of 0.25 indicates a random guess.