P41 Comparison of the accuracy of pencil-and-paper scoring and the HealthMeasures scoring with PROMIS profiles

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Objective: While pencil-and-paper scoring based on summed scores (SS scoring) is simple and widely used, it is less accurate—or exhibits increased uncertainty (INCREASE)—compared to response-pattern-based (RP) scoring via the HealthMeasures Scoring Service. Although values of INCREASE could inform the choice of scoring method, they are not currently provided to PROMIS users. Segawa (accepted) proposed a method to quantify INCREASE, but its application to PROMIS short forms (SFs) has been limited. This study applies the method to seven SFs from the PROMIS Profile to examine its utility in typical PROMIS use.

Methods: Following Segawa (accepted), we simulated response patterns (RPs) for one million hypothetical respondents and scored them using RP scoring. We then computed the average posterior error variances for each summed score (SS-level RP error variances) and plotted these against the SS posterior variances (SS-level comparisons). To evaluate scoring accuracy at the form level, we calculated weighted averages of RP and SS error variances using the frequency of each SS as weights (SF-level error variances). SF-level percent INCREASE was derived from these two values. For context, we also computed the average SF-level percent INCREASE resulting from shortening each SF by one item.

Results: Six of the seven SFs showed negligible SF-level percent INCREASEs (approximately 2%), and one SF showed a small INCREASE (7.4%). All values were smaller than the average INCREASE observed from 1-item shortening (approximately 11.9%).

Conclusions: The results suggest that INCREASE is not a meaningful concern for six SFs and only a minor consideration for one SF. However, this conclusion is limited to the specific SFs examined. Larger INCREASE values are possible, as reported in Segawa (accepted).