

Additional information for: A Value Framework Based on Multiple Criteria Decision Analysis for New Health Technologies Assessment under Universal Healthcare Coverage System in Taiwan

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Detailed description of three weighting methods

Weighting method	Description
Point allocation (domain-derived weighting)	<ol style="list-style-type: none"> A total of 100 points is allocated to individual value domains in proportion to their relative importance, with more points referring to a greater level of importance and relevance in the assessment of drug value. The sum of all criterion weights is equal to 100. Weights for the domains are presented as percentages, and the sum of all the weights is 100%.
Direct rating (indicator-derived weighting)	<ol style="list-style-type: none"> Each value indicator is rated using a five-point Likert scale ranging from 0 (“disagree”) to 4 (“strongly agree”), for the importance of the given indicator a respondent perceived. The total score of each value domain is the sum of the scores of its corresponding indicators. For example, the score of “Disease burden” domain is calculated as the sum of the scores of two corresponding indicators, namely “Size of population/prevalence” and “Disease severity”. Weights for the criteria are presented as percentages, and the sum of all the weights is 100%.
Simple MultiAttribute Rating Technique Exploiting Ranks (SMARTER) (domain-derived weighting)	<ol style="list-style-type: none"> The value domains are ordered based on their importance. In a set of K domains, each domain is assigned for a rank k, reflecting its relative importance. The rank k = 1 denotes the most important domain, followed by k = 2 until k = K. The final weighting score for a domain ranked k is denoted by W_k (k = 1, 2, . . . K) and calculated as: $W_k = \left(\frac{1}{K}\right) \sum_{i=k}^K (1/i).$ Since there are five value domains in our study, the weights for the 1st, 2nd, 3rd, 4th and 5th ranked domains are calculated as follows: $W_1 = \left(\frac{1}{5}\right) \sum_{i=1}^5 \left(\frac{1}{i}\right) = \left(\frac{1}{5}\right) \left(\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5}\right) = 0.457$ $W_2 = \left(\frac{1}{5}\right) \sum_{i=2}^5 \left(\frac{1}{i}\right) = \left(\frac{1}{5}\right) \left(\frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5}\right) = 0.257$ $W_3 = \left(\frac{1}{5}\right) \sum_{i=3}^5 \left(\frac{1}{i}\right) = \left(\frac{1}{5}\right) \left(\frac{1}{3} + \frac{1}{4} + \frac{1}{5}\right) = 0.157$ $W_4 = \left(\frac{1}{5}\right) \sum_{i=4}^5 \left(\frac{1}{i}\right) = \left(\frac{1}{5}\right) \left(\frac{1}{4} + \frac{1}{5}\right) = 0.09$ $W_5 = \left(\frac{1}{5}\right) \sum_{i=5}^5 \left(\frac{1}{i}\right) = \left(\frac{1}{5}\right) \left(\frac{1}{5}\right) = 0.04$

Weighting scores of individual value domains stratified by drug type (i.e., new oncology, new orphan, and other new drugs) obtained using Simple Multi-attribute Rating Technique Exploiting Ranks (SMARTER)

	New oncology drugs	New orphan drugs	Other new drugs
Overall clinical benefit	45.7	45.7	45.7
Disease burden	15.7	9.0	15.7
Alignment with patient concerns	25.7	25.7	9.0
Economic value	9.0	15.7	25.7
Feasibility of adoption into the health system	4.0	4.0	4.0

Weighting score estimates (95% confidence intervals) of individual value domains stratified by drug type (i.e., new oncology, new orphan, and other new drugs) obtained using direct rating.

	New oncology drugs	New orphan drugs	Other new drugs
	Mean (95% CIs)	Mean (95% CIs)	Mean (95% CIs)
Overall clinical benefit	21.5 (21.0, 22.0)	21.2 (20.5, 21.9)	21.2(20.7, 21.7)
Disease burden	20.2 (19.3, 21.1)	19.7 (18.7, 20.8)	20.5(19.7, 21.3)
Alignment with patient concerns	19.8 (19.0, 20.6)	20.3 (19.4, 21.2)	19.8(19.2, 20.5)
Economic value	19.6 (18.7, 20.5)	19.1 (18.1, 20.2)	20.5(19.8, 21.2)
Feasibility of adoption into the health system	18.9 (18.1, 19.7)	19.6 (18.6, 20.6)	17.9(17.1, 18.7)