Assessing different procurement models for automated insulin delivery (AID) systems using a multi-criteria decision analysis (MCDA) based framework

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OBJECTIVES:

Automated insulin delivery (AID) systems combine a continuous glucose monitor (CGM), insulin pump, and algorithm to automate insulin therapy in Type 1 Diabetes. The components of the system are often procured and reimbursed individually, despite being integrated with each other, which may conceal the holistic value of the system. **A multi-criteria decision analysis (MCDA) framework was used to assess the value of an all-in-one bundle-based subscription model as an alternative to component-based procurement.** The bundle includes all the components required to deliver the therapy and additional services to support people with diabetes (PWDs) and healthcare professionals (HCPs).

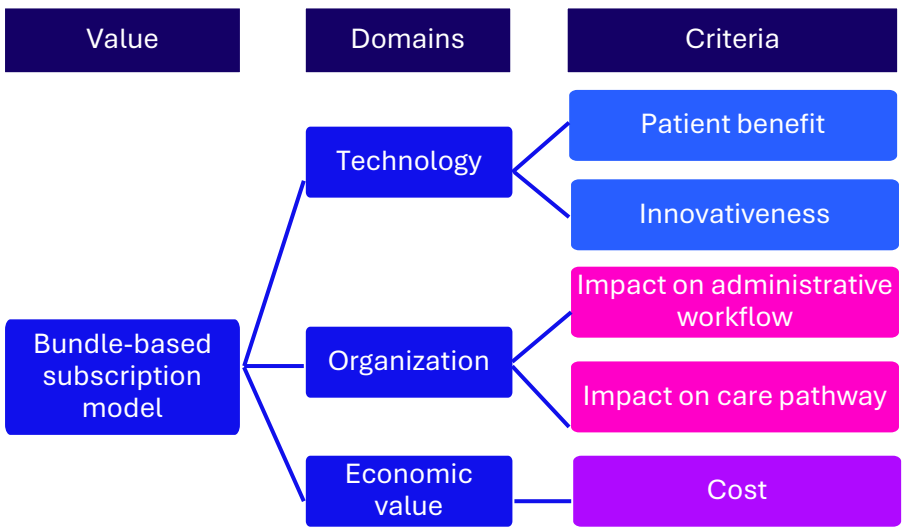

Figure 1. MCDA decision tree to assess the value of the bundle-based subscription model

METHODS:

A MCDA decision tree was developed based on frameworks that are currently being used or explored by decision-makers in Europe[1, 2]. A **panel of 2 HCPs and 5 payers from Finland, Germany, Spain, and the UK** ranked and scored the importance of the MCDA criteria, followed by the strength of evidence to support the bundle-based subscription model compared to traditional procurement models.

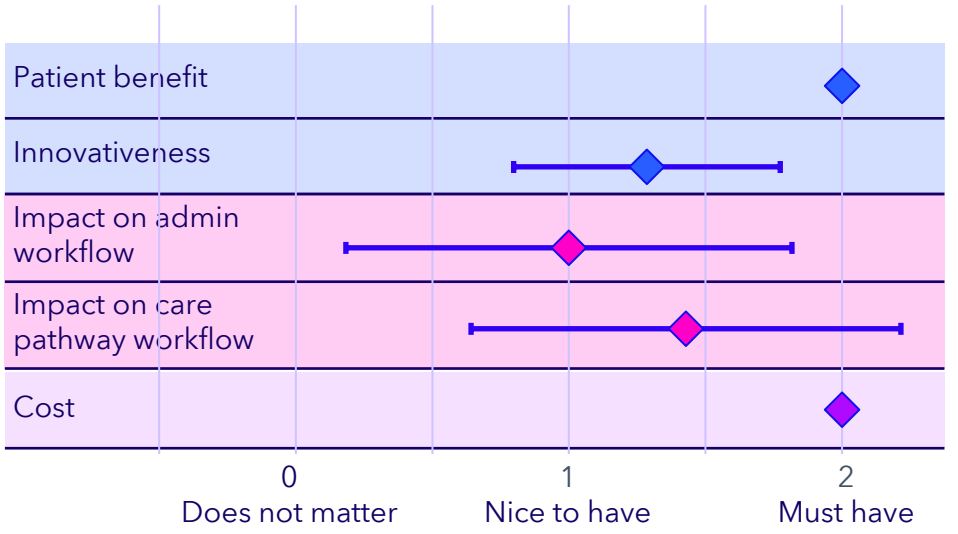

Figure 2. Mean weights (+/- SD) of assessment criteria recorded via MCDA exercise

Domain	Criteria *Supporting evidence package*	Scoring tendency
Technology	**Innovativeness** *Novelty of bundle with added-value services*	2 5
	Patient benefit *Easier therapy management for PWDs*	2 5
	Improved PWD satisfaction and experience	3 4
Organization	**Impact on administrative workflow** *Reduced admin complexity*	1 2 4
	Impact on care pathway workflow *Reduction in HCP time*	1 6
Economic value	**Cost** *Predictable monthly fee*	3 4
	Cost-savings by reducing overordering	1 2 4
	Cost-savings in HCP time and resources	1 6

In favour of traditional model | Neutral to bundle-based subscription model | In favour of bundle-based subscription model

Figure 3. Participant perspectives when shown evidence contributing to MCDA criteria

RESULTS:

Five value criteria were identified to evaluate AID procurement models (Figure 1). On a scale of 0 (does not matter) to 2 (must have), the criteria **patient benefit and cost received the highest mean weight of 2**, followed by impact on care pathway (1.4), innovativeness (1.3), and impact on administrative workflow (1) (Figure 2). When shown evidence on the five criteria, there was a **directional tendency to favour the bundle-based subscription model over traditional procurement models** (Figure 3); however, stakeholders asked for larger sample sizes and local data to better inform their decisions. In the two cases where participants favoured the traditional model, it was because they believed that the work required to implement the new model outweighed the benefits that it could bring.

CONCLUSIONS:

When assessing the use of different procurement models for AID systems, stakeholders see **cost and patient benefit as the most important criteria.** A bundle-based subscription model may be perceived as more favourable than traditional procurement models when **complemented with high-quality local evidence** demonstrating improved cost control, patient benefit, care pathway, innovativeness, and administrative workflow.

1. Goetghebeur, Mireille M et al. BMC health services research vol. 8 270. 22 Dec. 2008
2. Martelli N et al. Journal of Biomedical Informatics, vol. 201 208, Feb. 2016