

# Value Based Healthcare estimation value for benchmarking among Spanish Hospitals post knee prostheses

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## Aim

- Knee prosthesis surgery is one of the most common types of trauma surgery in Spain.
- The increasing interest in finding comparable cost per patient reported outcomes has not been accompanied with published estimations.
- The purpose of this work is to explore a patient-centered view of care through describing a real value-based estimation benchmark.

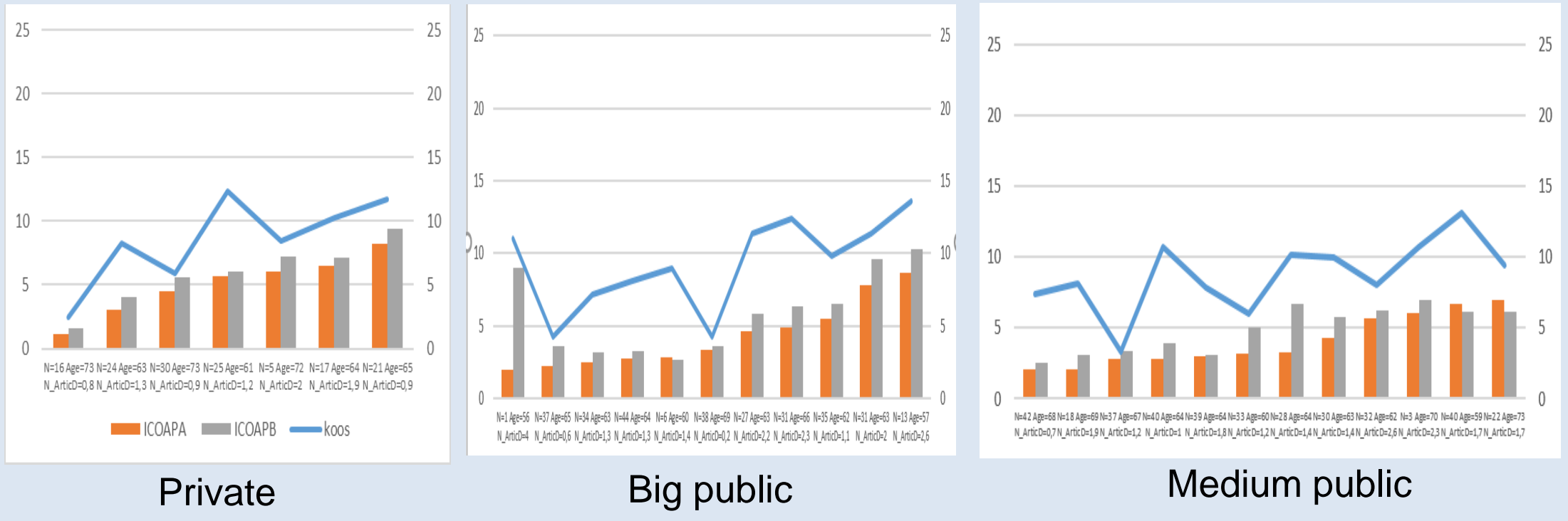
## Methodology

- Patient Reported Experience and Outcome (PRE+PRO) data was collected on **knee prosthesis surgery patients operated from January to June 2022 in 31 Spanish hospitals**. Data was collected between February and April 2023 (12-months later).
- **PRE** were collected with the **CAHPS** (19 items) **questionnaire and PROs following ICHOM recommendations** (3 general Questions (work status, prostheses satisfaction, joints with problems); generic questionnaire VR12; specific pain and functionality ICOAP and KOOS-Short Form).
- Questionnaires punctuations were scaled into 0-to-100 value-based-units ranges. Each questionnaire counted equal.
- **Costs data** was estimated through machine learning techniques based on the RECH (Spanish Net of Hospital Costs) per episode database which contains 5 millions of episodes with 10 partial cost vectors.
- **Costs were divided by the scaled punctuations** to find a proposal of average comparative Porterian estimations among centers.

## Results

- 804 patients responded to questionnaires (293 corresponded to big hospitals, 352 to medium hospitals and 159 to private hospitals). This means an average of 26.3 answers per hospital. The range of participants was from 1 to 44 participants.
- The average age per hospital was 65 years (range from 56 to 75). The average in-stay was 5 days per episode
- The variability across each type of hospitals for 12-months average knee functional and pain PROM scores is high, and can depend on the age or articulations affected by pain (figures)

- Persistent Pain (5 items, best 0-20 worst): 4.4 M:4.1 W:4.6
- (dis)Appear Pain (6 items, best 0-24 worst): 5.4 M:5.2 W:5.6
- KOOS-SF Function (7 items, best 0-28 worst): 8.8: M:8.2 W:9.1



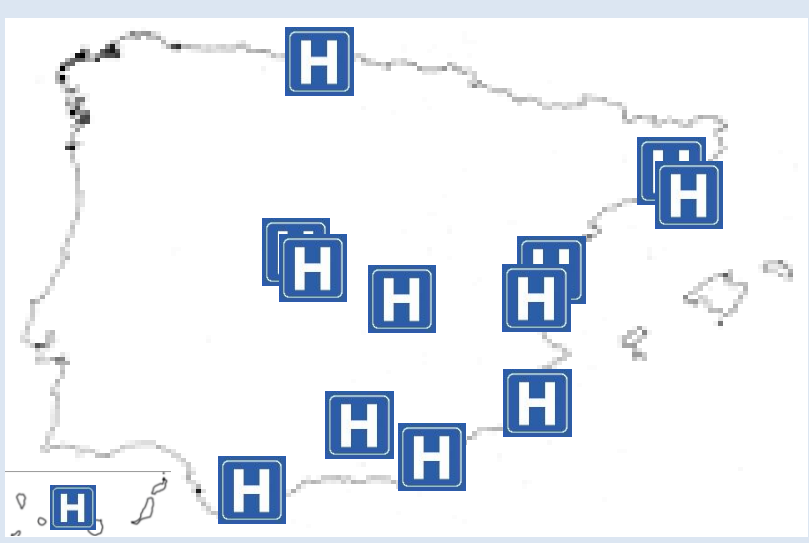
but also the average of knee or hip joints affected per patient variability is very high. 81% of centers had participant averages of 2 or less joints, whereas 19% of the hospitals had participant averages of more than 2 joints.

- The following table shows the PREMs and PROMs weighted into 0 to 100 values per type of hospital, the average unit cost for patient reported measures, the estimated average cost given the patients characteristics, and the final value coefficients.

HOSPITAL TYPE (n pts)	PREM (out of 100)	PROMs weighted into 0 to 100					PRM Unit Numerator	COST Denominator	VALUE Coefficient
		Total	(3Q	VR12	ICOAP	KOOS-SF			
• Public Big (298)	83.5	64.0	38-72-60	57-71*	70-75	49-72	→ 68.2	6,892€	101€/PRMU
• Public Medium (352)	88.5	69.2	31-73-65	65-77*	77-84	53-83	→ 72.0	6,079€	84€/PRMU
• Private (159)	90.2	66.5	40-72-68	59-72*	73-78	59-78	→ 73.6	6,562€	89€/PRMU

PRM: Patient Reported Measure \*the questions 1 and 11 are exceptions in this range

Participating Hospitals(region):  
 Sevilla, Cordoba, QuironSalud Malaga (Andalucia), Principe de Asturias (Asturias), San Juan de Dios, Negrín (Canarias), Ciudad Real (Cmancha), Terrassa, Garraf, Broggi dos de Maig, Granollers, Palamos, Vall d'Hebron, General de Catalunya Quiron, Sagrat Cor, Valls, Figueres, QuironSalud Vallès, Mutua Terrassa, Parc Salut Mar, Badalona, Blanes (Catalonia), Gregorio Marañón, Vithas Milagrosa, el Escorial (Madrid), Arrixaca (Murcia), La Fe, Ribera (Valencia),



## Conclusions

- Value-based medicine invites to work for excellence care through combining costs and self-reported outcomes.
- With limitations (low number of participants in some hospitals, only 14% of patients with more than 70 years (average is usually around 72y), this study proves the feasibility to start to approach practical figures and ratios that enable centers to compare among each other and decision-making
- Further analyses adjusted per complexity, changing the numerator calcs by transfer-to-utility regression models including CROMs +PREMs can help to improve

