



# Health-Related Quality of Life and Mapped Health Utility Values of Patients with Ankylosing Spondylitis in China: A Multicentre Real-World Study

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## BACKGROUND

- **Ankylosing spondylitis (AS)** is a chronic, progressive autoimmune disease characterized by the involvement of the sacroiliac joints, spinal bony prominences, and peripheral joints.
- Typical symptoms of AS include chronic low back pain, morning stiffness, and limited mobility, often accompanied by significant pain and functional impairment, which affects patients' **health related quality of life (HRQoL)**.

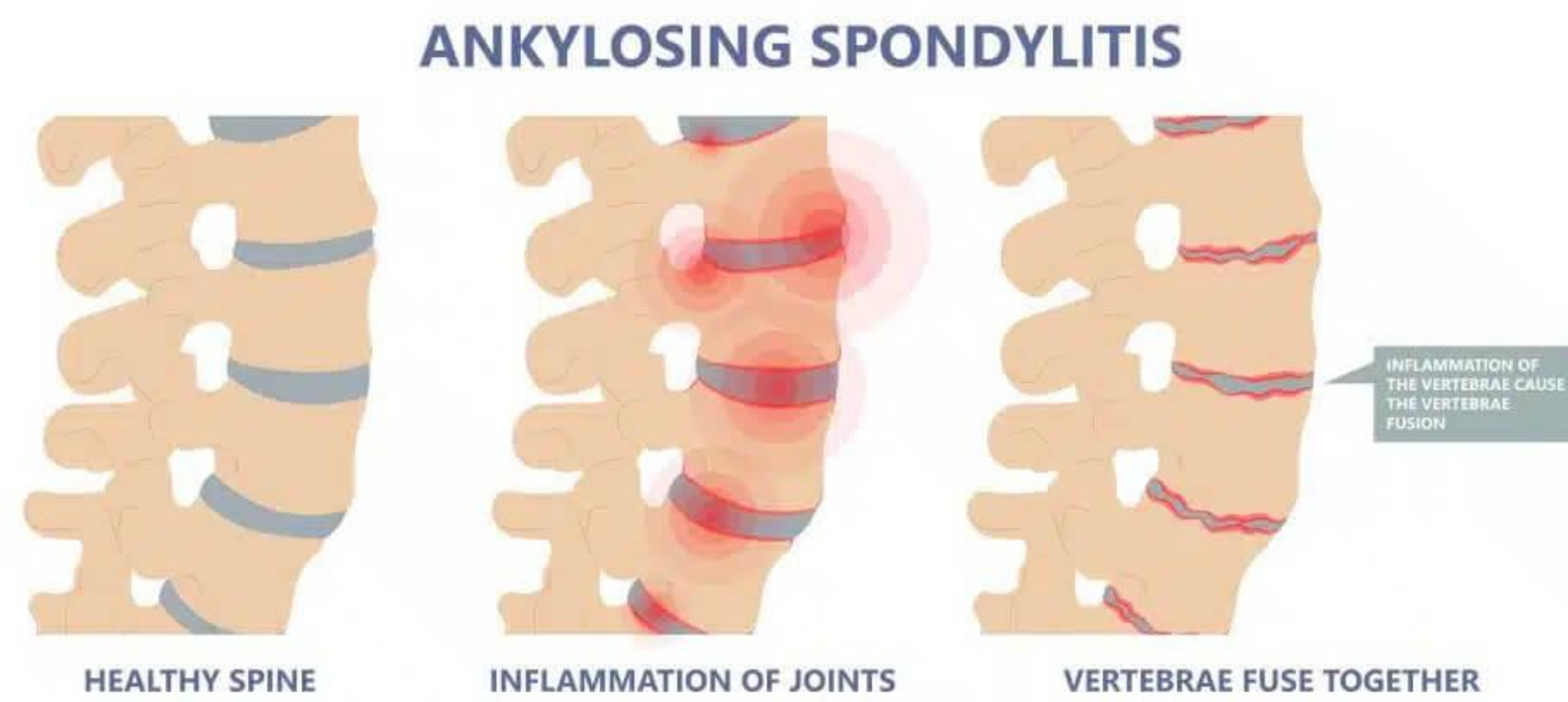


Figure1 symptom of AS in spine

- **As-specific** measurement instruments for HRQoL
  - Bath Ankylosing Spondylitis Disease Activity Index (**BASDAI**): reflecting inflammatory activity such as fatigue, spinal pain, peripheral joint involvement, and morning stiffness.
  - Bath Ankylosing Spondylitis Functional Index (**BASFI**): quantifying the functional impairments caused by spinal and hip joint limitations.
- **Health utility value(HUVs)** could be obtained through preference-based measures (PBMs), such as EQ-5D-5L or SF-6D.
- **Mapping Approach** uses statistical modelling to establish a functional relationship between non-PBMs (such as BASDAI and BASFI) and PBMs, thereby predicting HUVs.

## OBJECTIVE

- This study, based on a multicentre real-world study, aims to assess the distribution characteristics of HRQoL and HUV among Chinese patients with AS.
- This study will also explore the feasibility and accuracy of a mapping model based on BASDAI/BASFI and SF-36 for estimating HUV.

## METHODS

### Population

- Participants were drawn from a national multicentre cross-sectional study conducted under the **"Ankylosing Spondylitis Health Village Project" (AS-Health Village Project)**.
- The study ultimately included **2,258 eligible patients** with AS from over 360 centres across different provinces in China. The survey was conducted between **Jan 1 to Jan 14, 2024**.
- The project has been registered in the Chinese Clinical Trial Registry (ChiCTR) under registration number **ChiCTR2100054201**.

### Data collection

- Data collected in the study included basic information such as participants' demographic characteristics and clinical data, as well as HRQoL data.

### Health utility measurement

- Direct Measurement: **EQ-5D-5L** (License Number:78697)
- Indirect Measurement: **Generalized Measurement Mapping**
  - G-Map 1**: The eight dimension scores of the **SF-36 v1** were used to directly predict **SF-6D v1** utility values via ordinary least squares (OLS) regression.
  - G-Map 2**: Responses to 12 specific items from the **SF-36 v1** were mapped to the **six dimensions of the SF-6D**. Complete **item-level data** is crucial.
- Indirect Measurement: **AS Disease-specific Mapping**
  - DS-Map 1**: A best-fit model multinomial logit model (Mlogit) was applied to predict **EQ-5D-5L** utility values using **BASDAI and BASFI** scores.
  - DS-Map 2**: A best-fit model multinomial logit model (Mlogit) was applied to predict **SF-6D** utility values using **BASDAI and BASFI** scores.

## RESULT

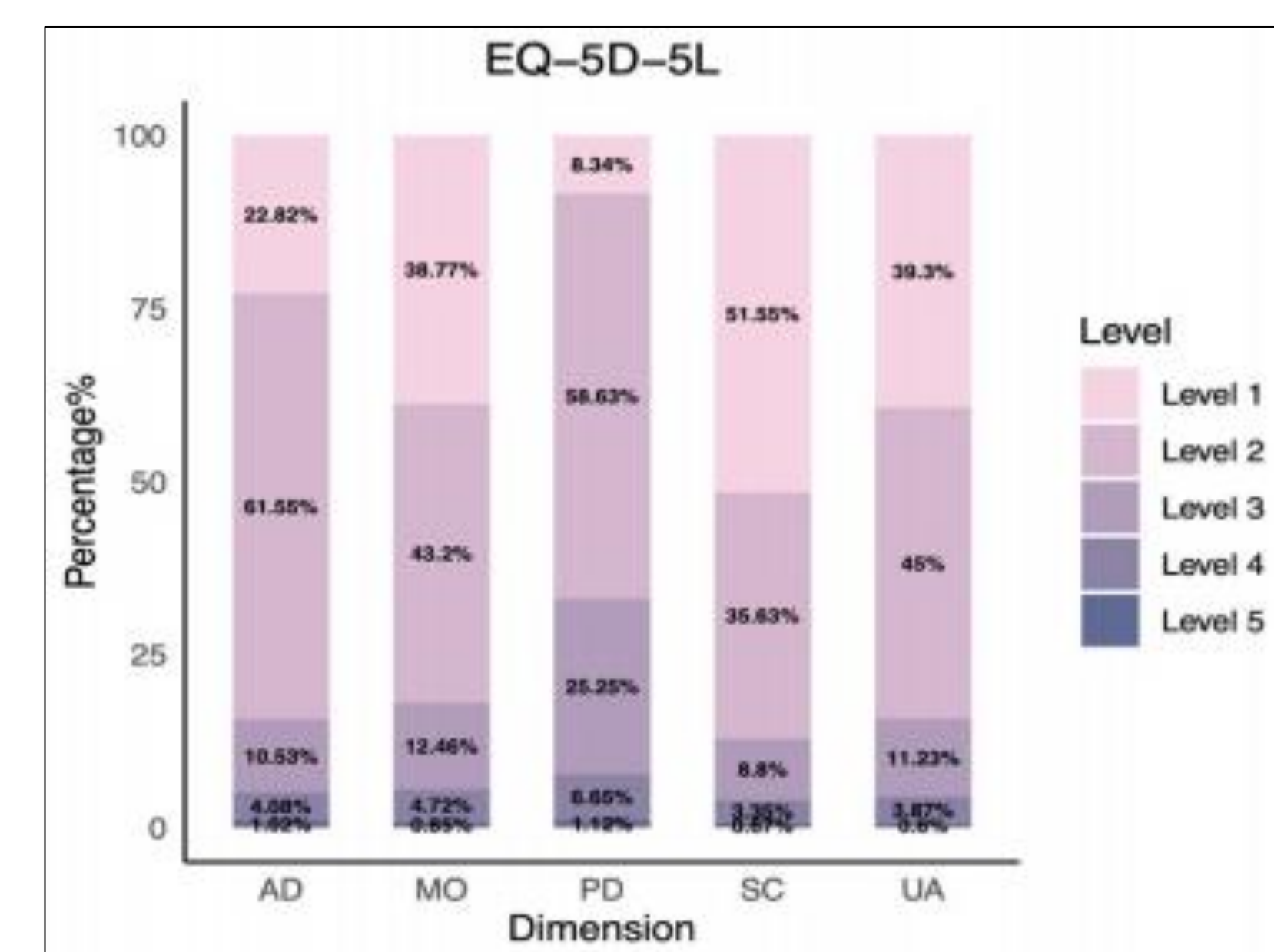


Figure 2 Distribution of the EQ-5D-5L across the five levels

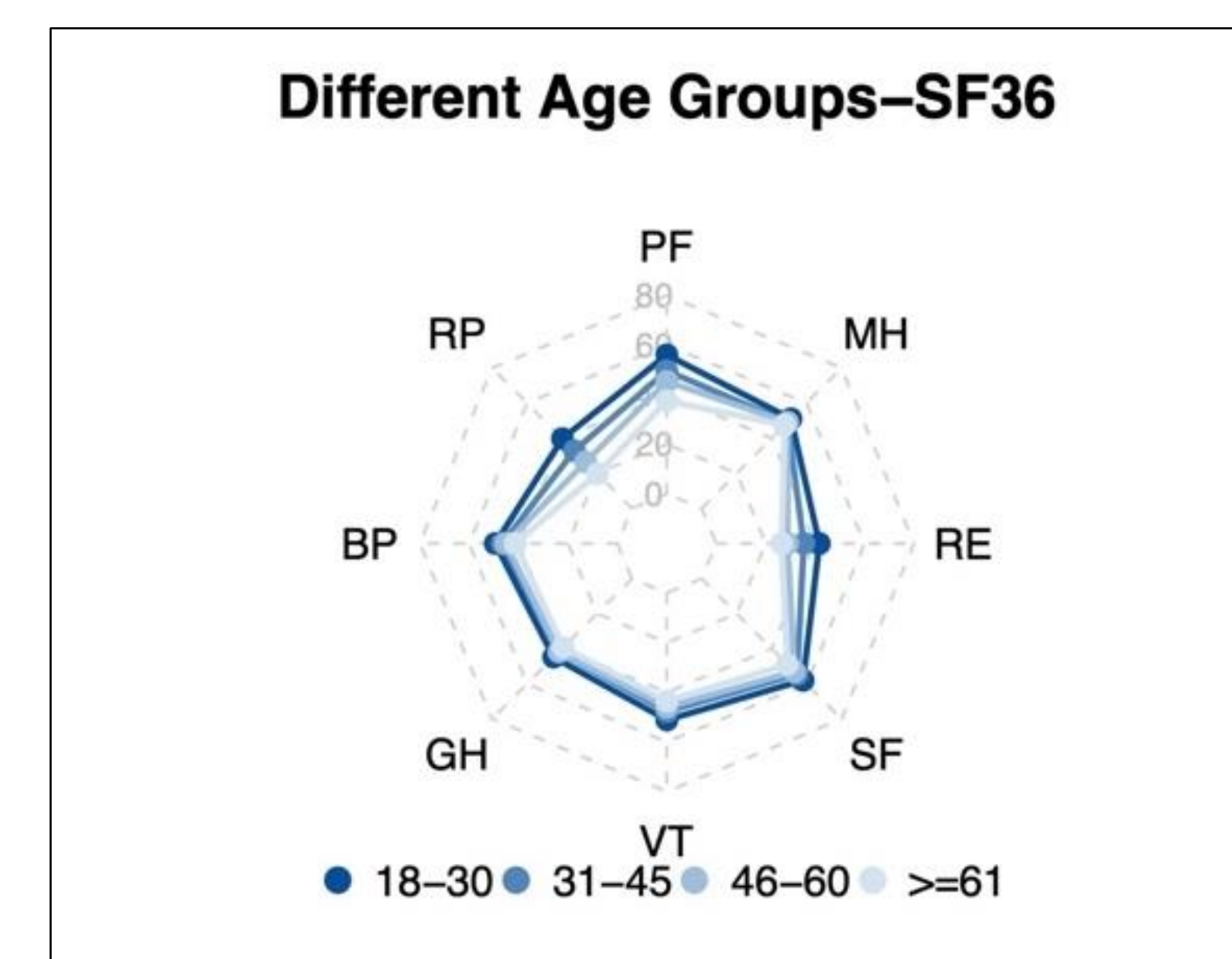


Figure 3 SF-36 Scores by Dimension (by Age Subgroup)

Table 2 HUV from five measurement

Measurement	Mean (SD)	Median (Q1,Q3)	Rang (Min, Max)
EQ-5D-5L	0.713(0.239)	0.734(0.654,0.893)	-0.391, 1.000
G-Map 1	0.676(0.096)	0.676(0.611,0.747)	0.394,0.901
G-Map 2	0.709(0.087)	0.699(0.642,0.771)	0.444,0.963
DS-Map 1	0.684(0.187)	0.716(0.556,0.837)	0.085,0.982
DS-Map 2	0.628(0.017)	0.627(0.616,0.640)	0.549,0.696

- There were significant differences among four indirect methods and the differences between each of them with direct EQ-5D-5L measurement ( $p < 0.05$ ).
- **G-Map2** produced utilities ( $0.709 \pm 0.087$ ) closest to EQ-5D-5L.
- DS-Map1 yielded the **widest predicted** range (0.085–0.982), whereas DS-Map2 generated **highly concentrated** estimates (0.549–0.696).

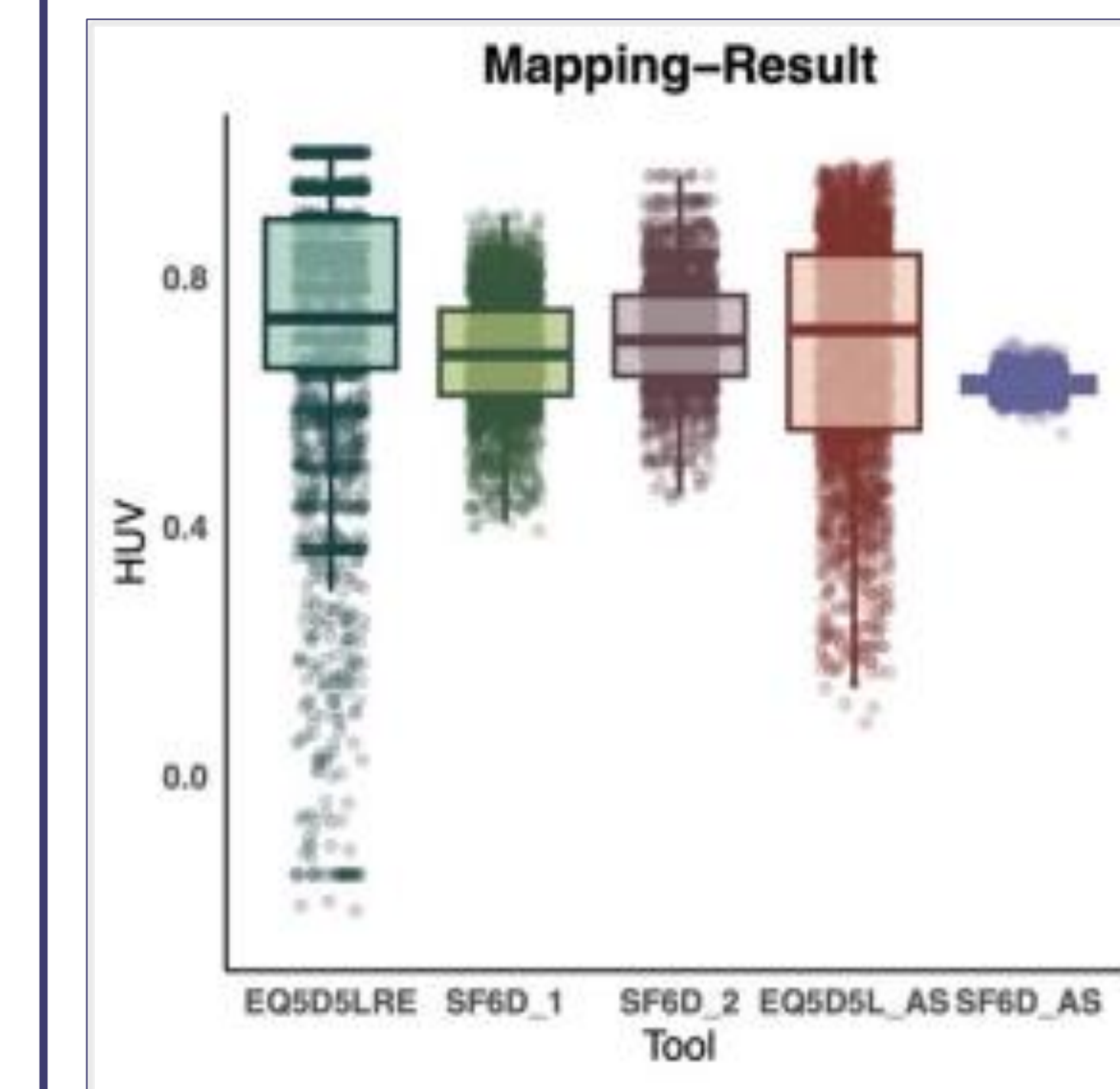


Figure 4 Density Maps of HUV results from five HUV measurement#

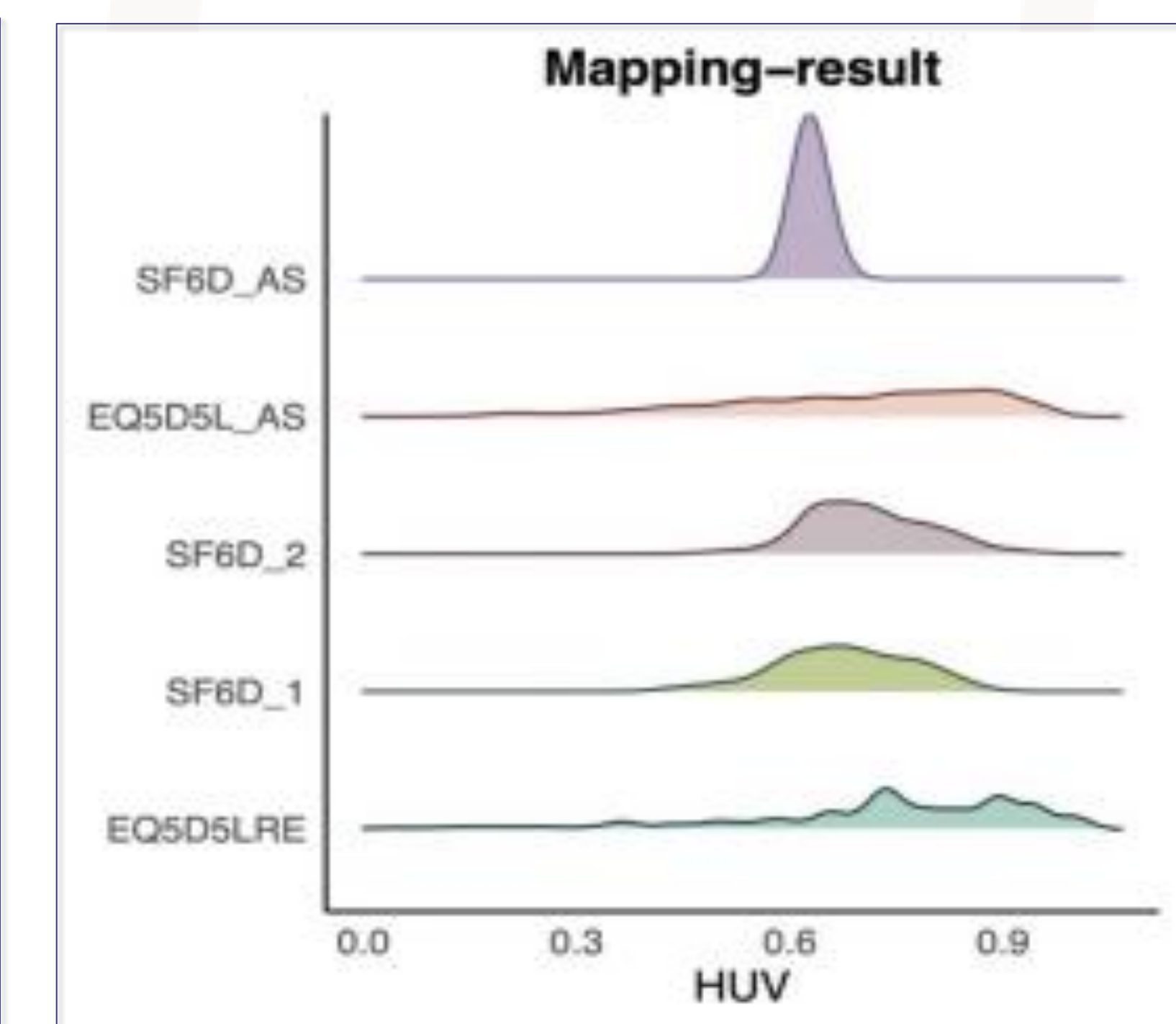


Figure 5 Box-and-whisker plots of HUV results from five HUV measurement#

#EQ5D5LRE: Direct Measurement EQ-5D-5L; SF6D\_1: G-Map 1; SF6D\_2: G-Map 2; EQ5D5L\_AS: DS-Map1; SF6D\_AS: DS-Map2

## CONCLUSION

- The impairment in HUVs was **severe** among Chinese patients with AS.
- SF-6D-based mapping results were generally **lower than** EQ-5D-5L
- There were significant differences in the mapped **distributions** based on BASDAI and BASFI