

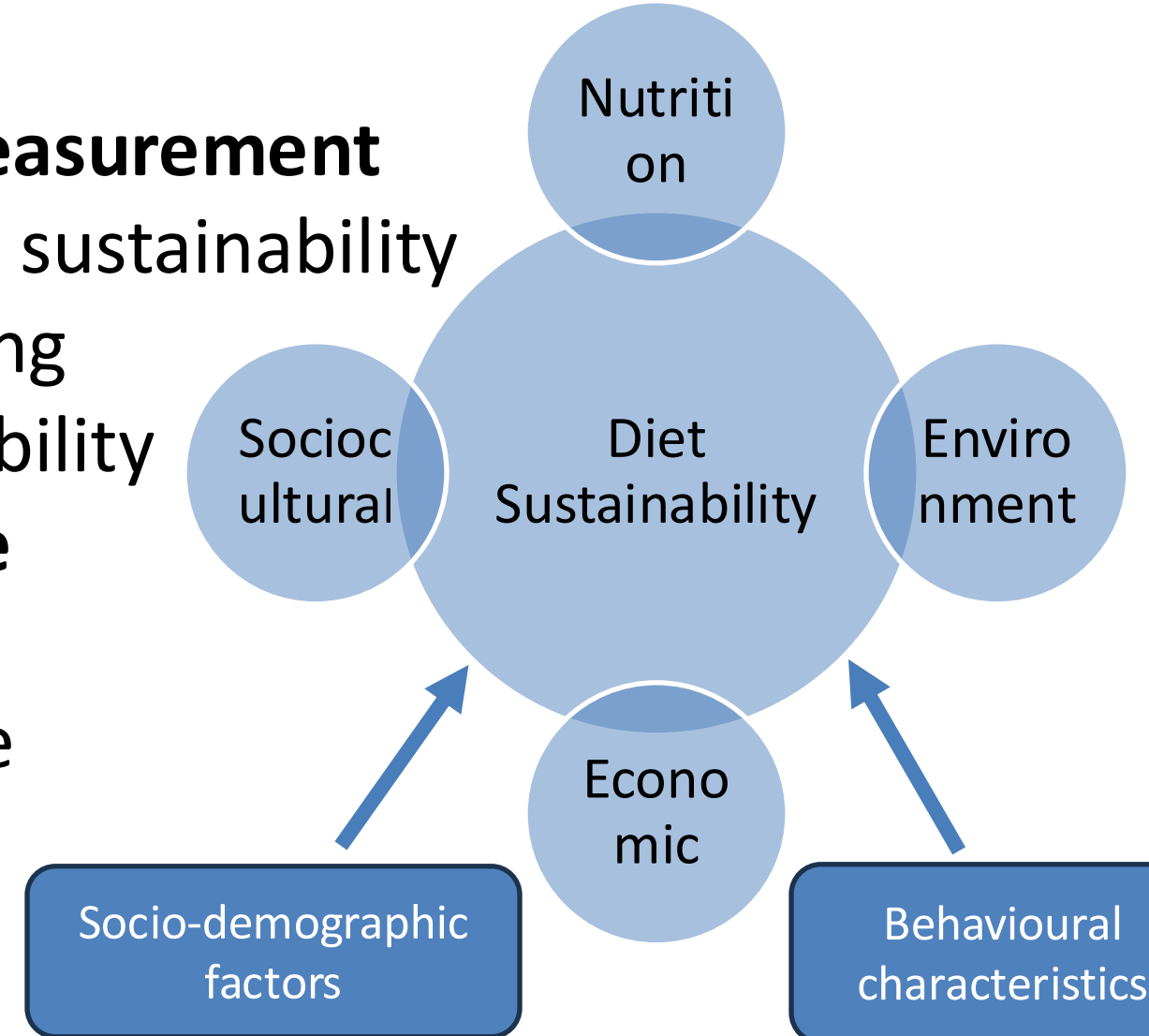
Adapting the Diet Sustainability Score (DSS) to the Paediatric Population and Investigating Socio-Demographic and Behavioural Determinants

Kate Kobayashi Harford^{1,2}, Dr Mariana Rei³, Dr John Kearney²

¹School of Medicine, Trinity College, The University of Dublin; ²School of Biological and Health Science, Technological University Dublin; ³Faculty of Nutrition and Food Sciences, University of Porto

Introduction

- Food systems play a central role in shaping both **human and environmental health**. However, in its current form, it poses significant threats to both.
- The original DSS is a **multicriteria measurement** developed by Rei *et al.* to assess diet sustainability for the adult population, incorporating the **four dimensions** of diet sustainability defined by **The Food and Agriculture Organisation**.¹
- Few instruments are available for the assessment of diet sustainability for the **paediatric population**.²



Aims

- To **adapt and validate** the DSS for application in children and adolescents aged 3-17 years
- To **evaluate the association** between diet sustainability and **socio-demographic and behavioural factors**, in a nationally representative sample of the Portuguese paediatric population.

Methodology

Study Population: IAN-AF 2015/2016³

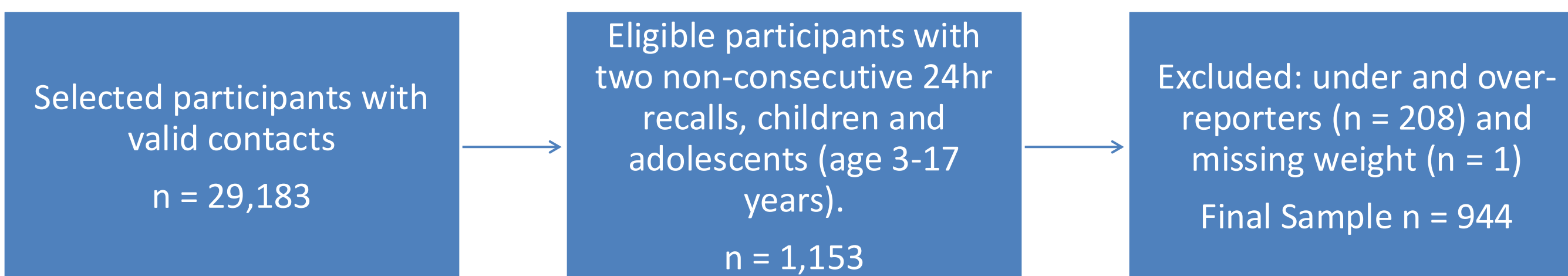


Figure 1: Sample Selection Process from the IAN-AF

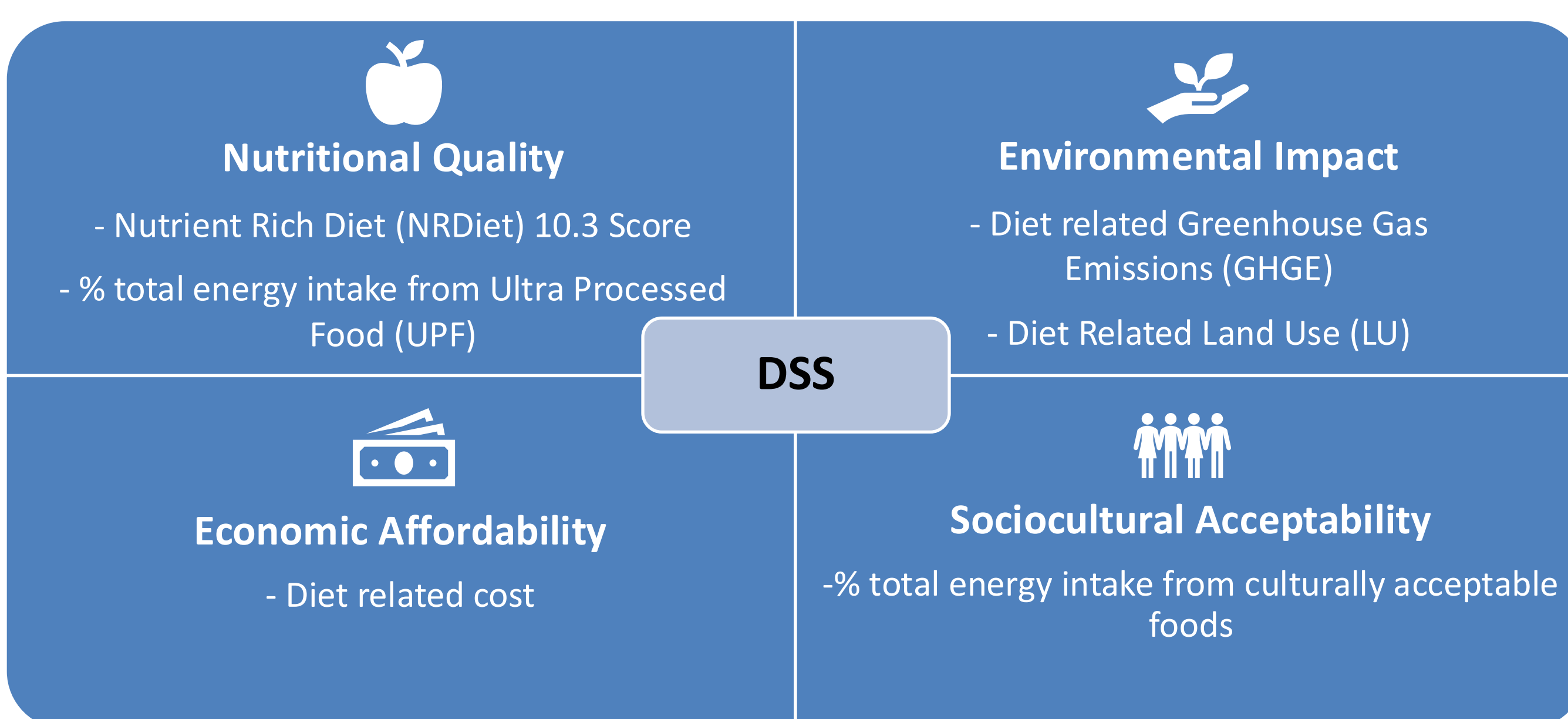
Study variables

Socio-demographic	Behavioural
Sex	Regular sports
Area of residence	Screen time
Parental education	Sleep duration
Family Structure	Eating location

DSS Validation Procedures

- Floor and Ceiling Effects
- Interpretability
- Content Validity
- Reproducibility (Test-retest)
- Construct Validity

Adapting DSS for the paediatric population



References

- Rei M, Silva CC, Torres D, Sage C, Rodrigues S. Development and validation of a multicriteria measure to assess the sustainability characteristics of diets: the Diet Sustainability Score. *European Journal of Nutrition* [Internet]. 2025 Dec 1;64(8):328. Available from: <https://pubmed.ncbi.nlm.nih.gov/41324694/>
- Lopes C, Torres D, Oliveira A, Severo M, Guimaraes S, Alarcão V, et al. National Food, Nutrition, and Physical Activity Survey of the Portuguese General Population (2015-2016): Protocol for Design and Development. *JMIR Research Protocols* [Internet]. 2018 Feb 15;7(2):e42. Available from: <https://pubmed.ncbi.nlm.nih.gov/29449204/>
- Teixeira B, Afonso C, Rodrigues S, Oliveira A. Healthy and Sustainable Dietary Patterns in Children and Adolescents: A Systematic review. *Advances in Nutrition* [Internet]. 2021 Nov 25;13(4):1144–85. Available from: <https://pubmed.ncbi.nlm.nih.gov/34850824/>

Results

Validated tool; ICC = 0.302, 15/20 (75%) of conceptually defined hypotheses were confirmed.

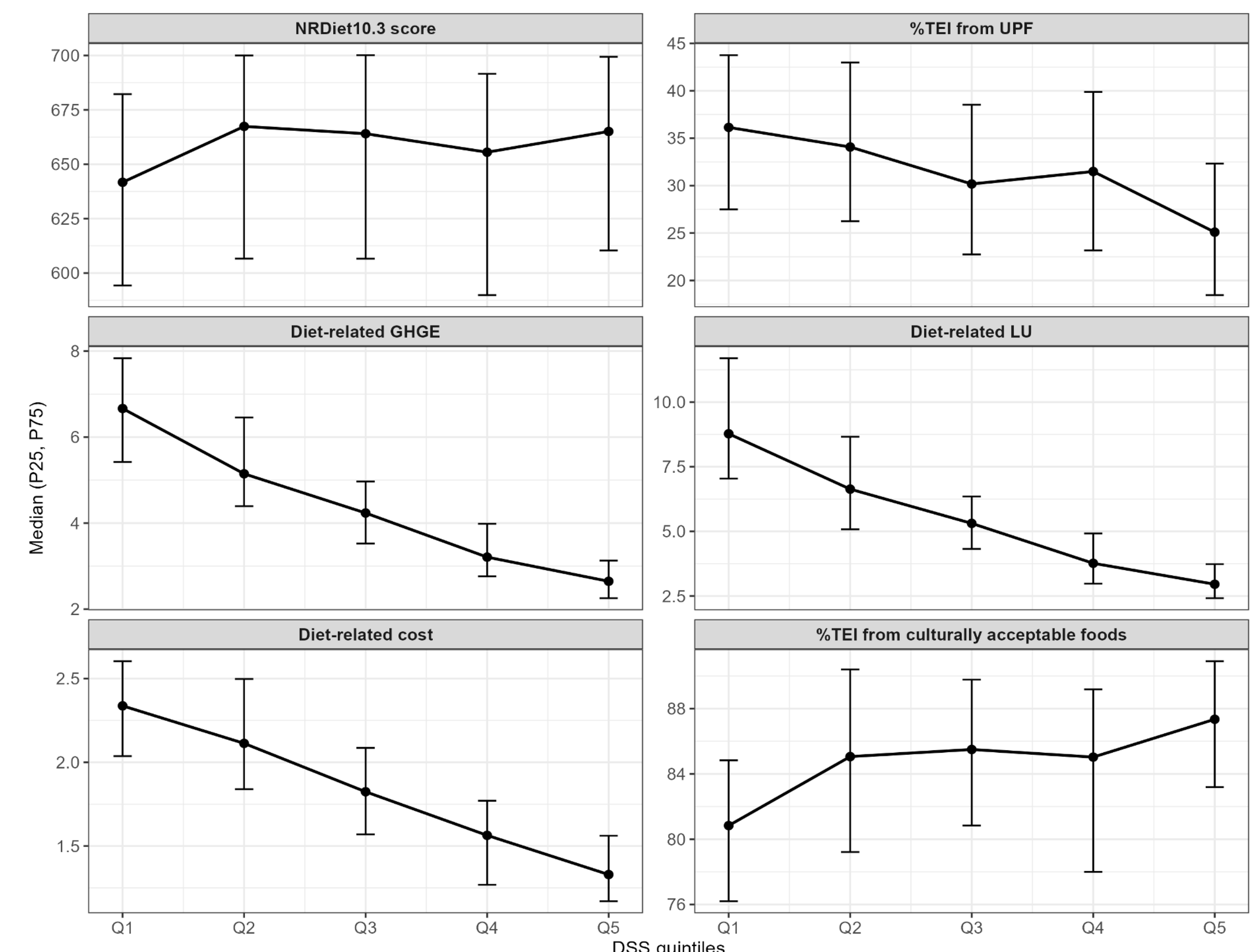


Figure 2: Trends in nutritional, environmental, economic and socio-cultural indicators across DSS quintiles. Values are medians with interquartile ranges (P25, P75). Q = Quintile

Food group consumption across quintiles (Q) of the Diet Sustainability Score (DSS)

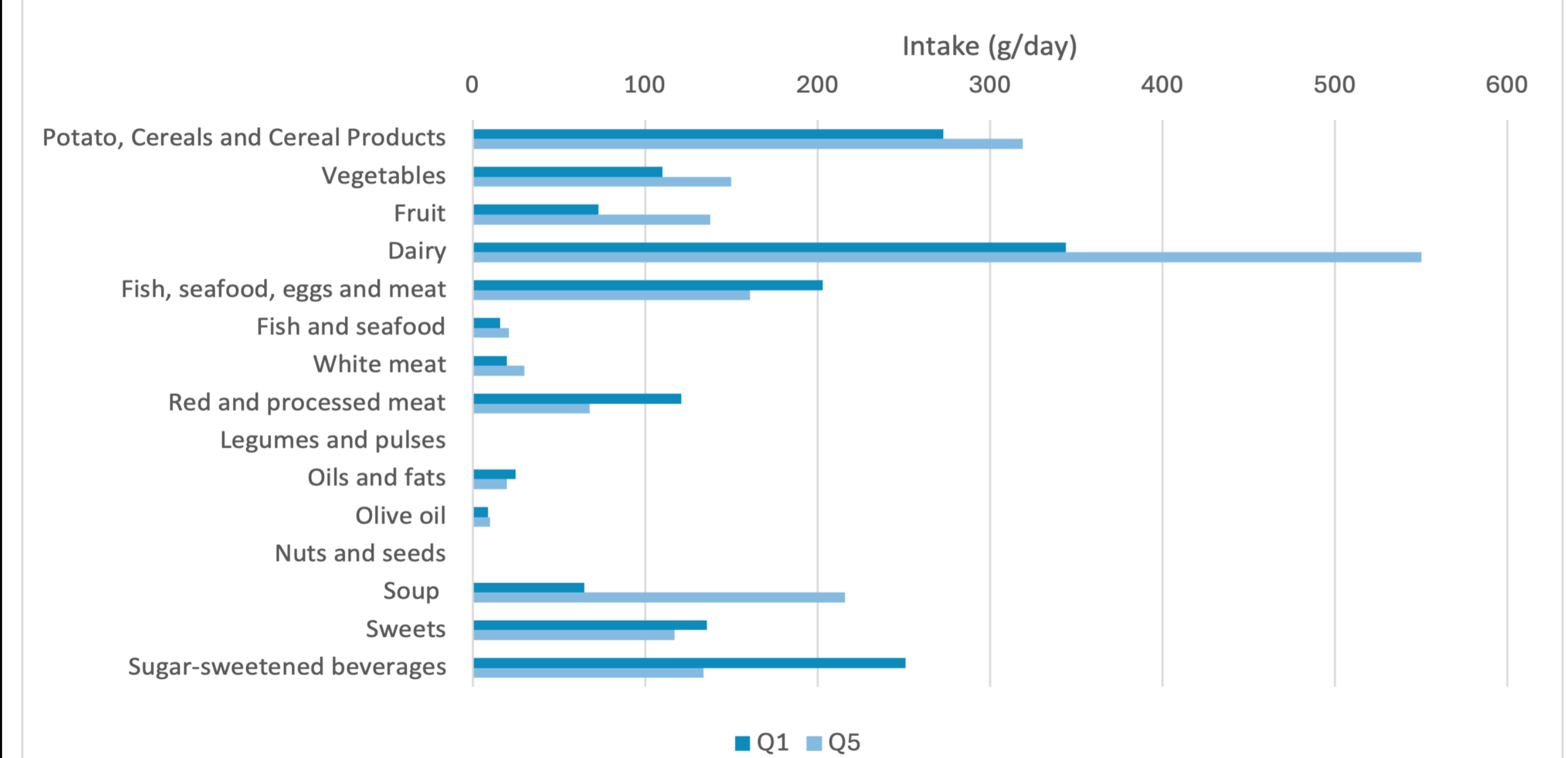


Figure 3: Food group consumption across quintiles of the Diet Sustainability Score. Q1 = Quintile 1, Q5 = Quintile 5. Energy intake standardised to 2200kcal/day.

Socio-demographic and Behavioural Determinants

Higher DSS correlated with:

- Predominantly rural area ($\beta = 0.50$)
- No regular sports activity ($\beta = 0.35$)

Lower DSS correlated with:

- Adolescents ($\beta = -2.65$)
- Eating at restaurants ($\beta = -0.75$)
- Male ($\beta = -0.59$)
- Living with ≤ 1 parent ($\beta = -0.57$)
- Higher maternal education level ($\beta = -0.45/-0.47$)

Statistically significant results presented (defined as 95% confidence intervals excluding zero). All results were adjusted for sex and age.

Conclusion

- This study **adapted and validated** the DSS to the paediatric population, offering a multicriteria measure to assess diet sustainability.
- Lower diet sustainability** was most strongly associated with adolescents and eating at restaurants and **unexpectedly** associated with higher maternal education level and regular sports activity.
- Conducting this study again using **more recent data** would offer insight into societal and behavioural changes over the decade and trajectory of evolving dietary patterns.