

Introduction & Objectives

Cardiovascular diseases (CVD) impose significant burdens not only on patients but also on the health-related quality of life (HRQoL) of their family members, driven by emotional stress and caregiving responsibilities. Medical interventions that reduce this burden could help mitigate these spillover effects.

However, the absence of systematic data on these impacts often leads to their exclusion from cost-effectiveness analyses (CEAs), potentially underestimating the full value of CVD interventions. This study aims to develop a catalog of estimates quantifying the impact of CVD on family members’ HRQoL.

Data

- 2008 – 2019 Medical Expenditure Panel Survey (MEPS)
- Medical conditions files: ICD 9 (2008-2015), ICD 10 (2016-2019)
  - Full-year consolidated data files:
    - SF-12v2 (2008-2016), VR-12 (2017-2019)
    - Demographic and socioeconomic variables
    - Priority conditions to control for other chronic illnesses.
  - EQ-5D utility is predicted based on SF-12v2 and VR-12 using machine learning model.
  - EQ-5D with time trade-off (TTO) and visual analog scale (EQ VAS).

Results

- Family members of CVD patients have lower mean EQ-5D utility scores compared to families without CVD patients: **0.035** (95% CI: [0.033, 0.038]) lower on TTO approach and **0.032** (95% CI: [0.029, 0.034]) lower on VAS approach.
- Counterfactual scenario analysis

CVD patient EQ-5D	Family member EQ-5D	Family member EQ-5D reduction
1	0.934	-
0.9	0.891	-0.043
0.8	0.878	-0.056
0.7	0.864	-0.071
0.6	0.848	-0.086
0.5	0.830	-0.104
0.4	0.811	-0.123

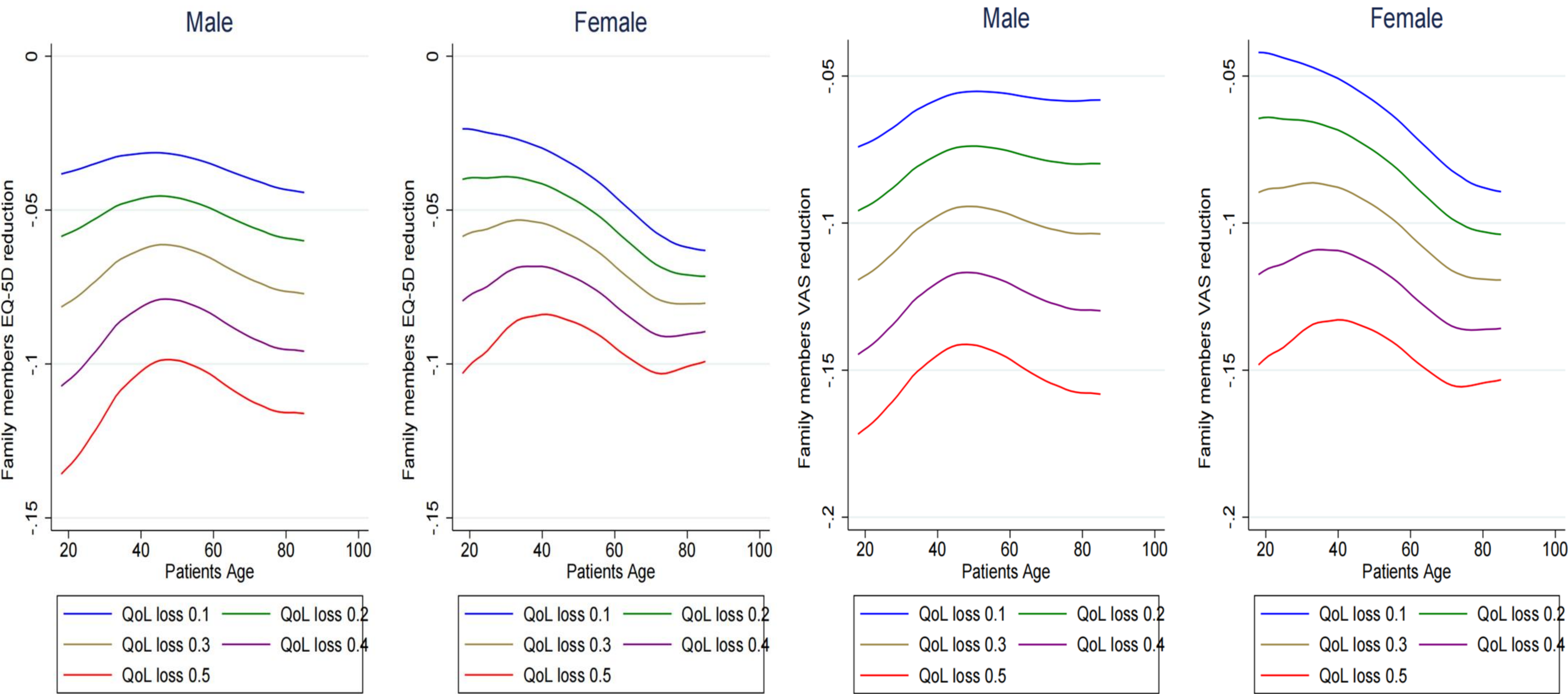


Figure 1. Family spillover effects by CVD patient age and sex

Results - Myocardial Infarction

- Family members of myocardial infarction patients have lower mean EQ-5D utility scores compared to families without CVD patients: **0.044** (95% CI: [0.040, 0.047]) lower on TTO approach and **0.040** (95% CI: [0.037, 0.044]) lower on VAS approach.

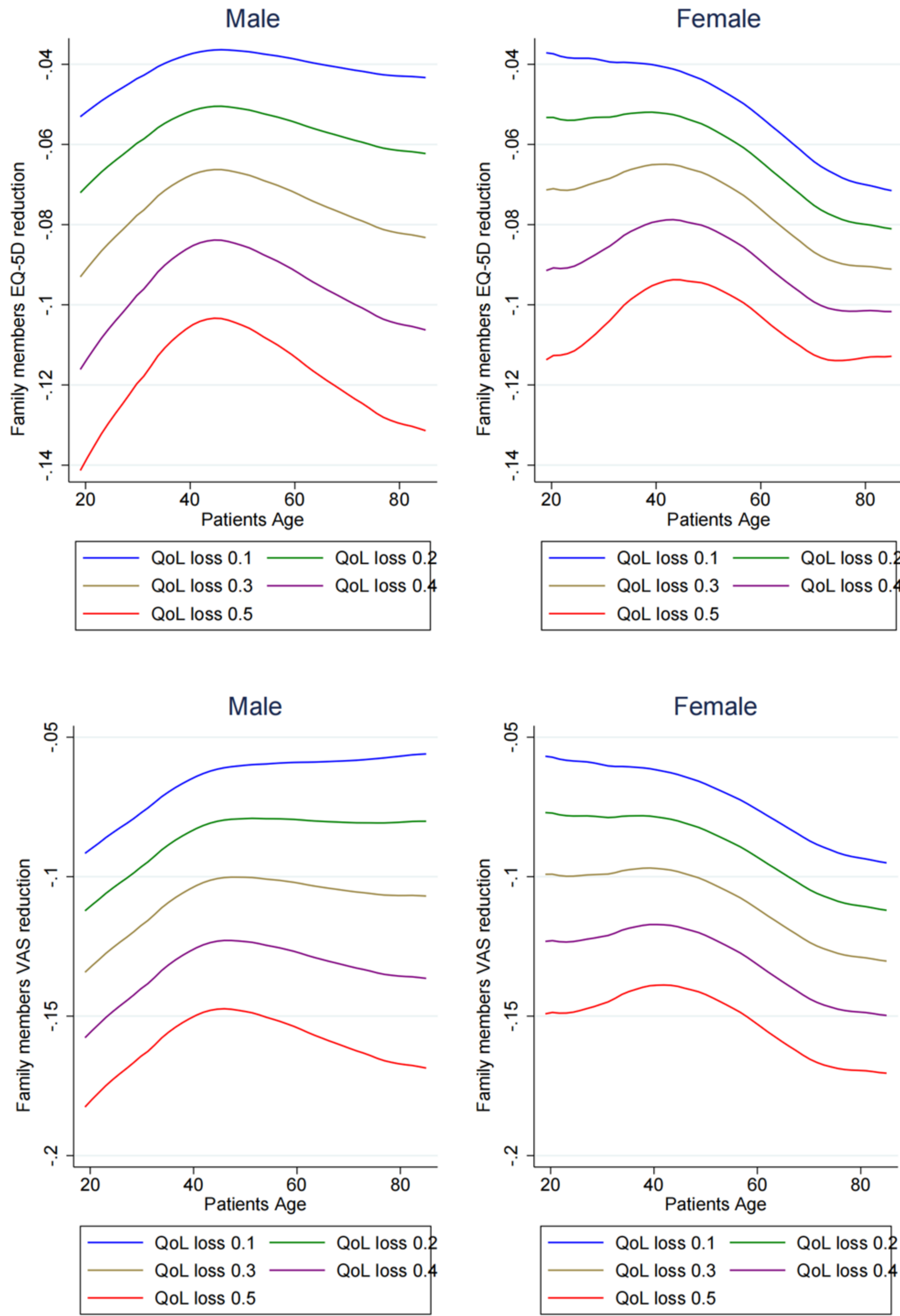


Figure 2. Family spillover effects by of myocardial infarction patients age and sex

Conclusion

- Family members of CVD patients have lower EQ-5D utility scores compared to families without CVD patients.
- Develop a catalog of estimates to include family spillover effects into cost-effectiveness analysis and provides a more accurate assessment of interventions.
- $ICER = \frac{\Delta C}{\Delta Q_{patient}} \rightarrow \frac{\Delta C}{\Delta Q_{patient} + \Delta Spillover\ effect}$
- Rising importance of family-centered interventions.