ECONOMIC BURDEN OF IMMUNE-RELATED ADVERSE EVENTS OF IMMUNE CHECKPOINT INHIBITORS FROM PAYER PERSPECTIVE. A REAL-WORLD PATIENT-LEVEL MICRO-COSTING STUDY FROM QATAR

EPH186

Nabil Elhadi Omar[1,2*] · Laila Shafei[2] · Seif Abaza[2] · Aya Alasmar[2] · Farah Jibril[2] · Anas Hamad[3,4] · Hazem Elewa[4] · Daoud Al-Badriyeh[4*]

1. QU Health, Qatar University, Doha, Qatar.
2. Pharmacy Department, National Center for Cancer Care and Research, Hamad Medical Corporation, Doha, Qatar.
3. Drug Supply Department, Hamad Medical Corporation, Doha, Qatar.
4. College of Pharmacy, QU Health, Qatar University, Doha, Qatar.

ISPOR Europe 2026
8-11 November | Vienna, Austria

Poster Session 4 · Tuesday 10 November

Scan to contact the Corresponding author

131	QAR 6.10 M	95.1%	OR 2.29	OR 5.89
patients · 170 cost records	total direct cost (2026 prices)	of spend is hospitalisation	per grade → top-quartile spend	fatal irAE → top-quartile spend

Background

Immune checkpoint inhibitors (ICIs) have transformed cancer care, but the cost of managing immune-related adverse events (irAEs) is rarely measured.

Trial safety reporting captures **incidence, not resource use**, leaving payers without the inputs needed to budget for toxicity in publicly funded systems.

Objectives

To quantify the **direct medical cost** of irAE management at patient level, identify where expenditure concentrates, and model the savings achievable through toxicity-stewardship intervention.

Methods

Design: retrospective bottom-up micro-costing, NCCCR/HMC Doha; 131 ICI-treated patients contributing 170 patient–organ-system cost records (178 irAEs, 13 organ systems).

Domains: hospitalisation (bed-day rate × attributable LOS), medications, laboratory tests, procedures — valued at uniform 2020 institutional unit costs.

Price basis: revalued to 2026 prices using the chained year-on-year Qatar Health-group CPI (factor 0.94372; net −5.63%). Shares and ratios are identical on both bases.

Analysis: Lorenz/concentration analysis, Gamma GLM and Firth-penalised logistic regression; one-way deterministic sensitivity analysis on structurally independent inputs.

Reporting: CHEERS 2022. Currency QAR (1 QAR ≈ 0.275 USD).

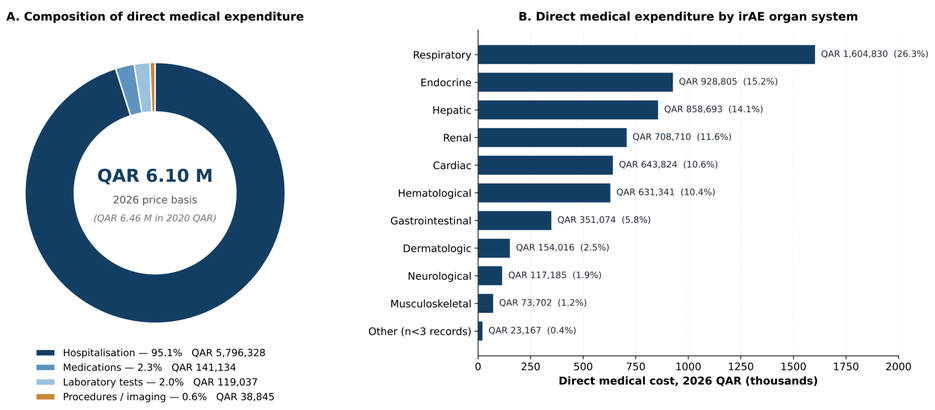

Figure 1. Composition of direct medical expenditure and total spend by irAE organ system (2026 prices).

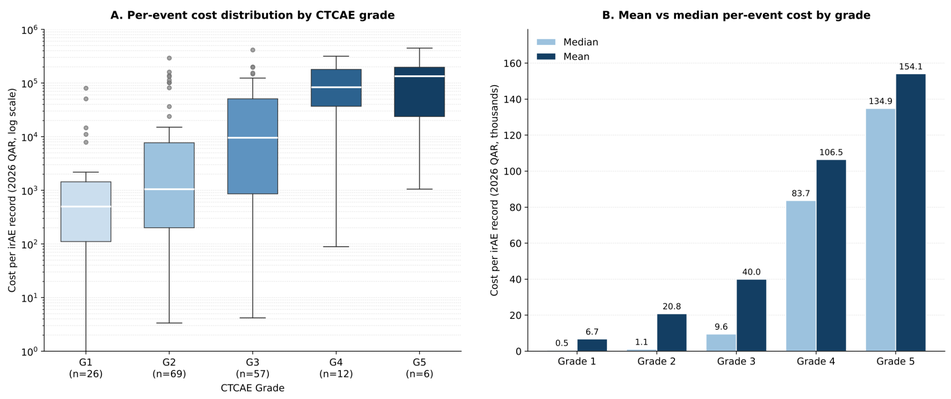

Figure 2. Per-event cost distribution and mean vs median cost by CTCAE grade (2026 prices, log scale).

Cost-Avoidance Scenarios

Scenario (modelled)	Saving, QAR	% of total
Hospitalisation cost − 5%	289,816	4.8
Hospitalisation cost − 10%	579,633	9.5
Hospitalisation cost − 15%	869,449	14.3
Hospitalisation cost − 20%	1,159,266	19.0
One inpatient day avoided in 66 patients	479,599	7.9
Top-quartile spend − 10%	518,852	8.5
Laboratory monitoring − 10%	11,904	0.2
Medication cost − 10%	14,113	0.2

Table 1. Deterministic cost-avoidance scenarios, 2026 prices. Percentages are of total direct cost (QAR 6,095,345).

Results

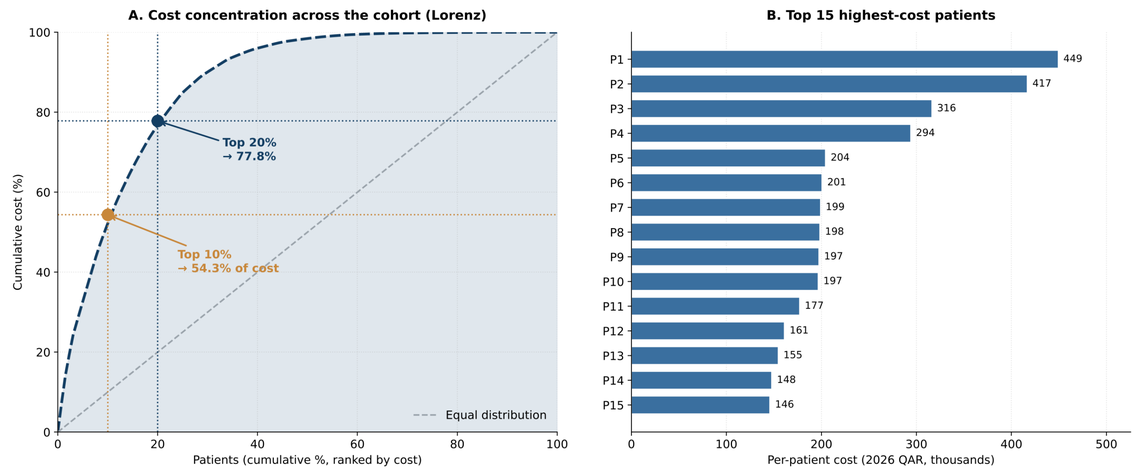

Figure 3. Cost concentration across the cohort (Lorenz) and the 15 highest-cost patients.

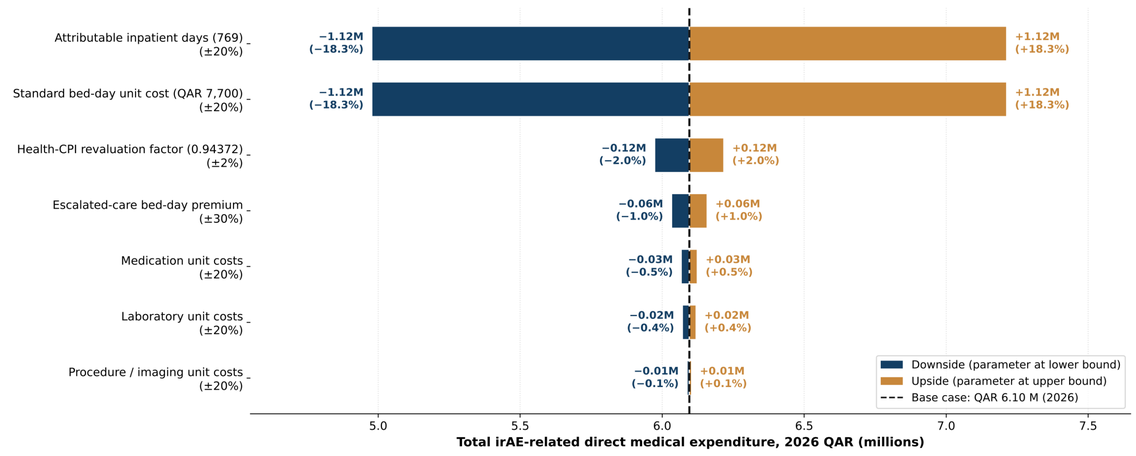

Figure 4. One-way deterministic sensitivity analysis; base case QAR 6.10 M (2026).

KEY FINDINGS

- Total irAE-related direct cost QAR 6.10 M (USD ≈ 1.68 M) across 131 patients; mean QAR 46,529, median QAR 7,304 per patient.
- Hospitalisation absorbed 95.1% of spend — preventing one inpatient episode is ~41× more consequential than an equivalent cut in medication use.
- Cost rose 271-fold from grade 1 to grade 5 (median QAR 498 → 134,879); grade 3–5 events drove 73.5% of expenditure from 44% of records.
- Spend is concentrated: top decile 54.3%, top quintile 77.8%. 102 of 170 records (60%) were managed without admission, at 2.25% of total cost.
- Independent predictors of top-quartile spend: CTCAE grade OR 2.29 (1.20–4.37, p=0.012), fatal irAE OR 5.89 (1.28–27.1, p=0.023), number of irAE categories OR 1.83 (0.93–3.61, p=0.082). Gamma GLM: cost ratio 2.98 per grade and 1.17 per inpatient day (both p<0.001).
- A 10% reduction in inpatient-day exposure would avoid QAR 579,633 (9.5%) — versus QAR 14,113 (0.2%) from a 10% medication cut.

Conclusion

irAE-related expenditure in this publicly funded oncology setting is driven almost entirely by inpatient care, concentrated in a small minority of patients, and steeply graded by toxicity severity.

Toxicity stewardship that prevents or shortens admission, rather than drug-level cost control, is where meaningful savings lie.

References & Contact

1. Postow MA, et al. N Engl J Med 2018;378:158–168.
2. Wang DY, et al. JAMA Oncol 2018;4:1721–1728.
3. Husereau D, et al. CHEERS 2022. Value Health 2022;25:3–9.
4. Qatar National Planning Council, Consumer Price Index by expenditure group, 2026.

Corresponding author: Dr Nabil Elhadi Omar · NCCCR, Hamad Medical Corporation, Doha, Qatar · nomar4@hamad.qa

With thanks to the National Center for Cancer Care and Research and Hamad Medical Corporation, and the College of Pharmacy, QU Health, Qatar University.

Keywords: Immune checkpoint inhibitors · Immune-related adverse events · Micro-costing · Healthcare resource utilisation · Qatar