



Healthcare utilisation and inpatient cost of periprosthetic joint infection: a national cohort analysis from Ireland



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Introduction

- Periprosthetic joint infection (PJI) is among the most costly complications of arthroplasty, yet national data describing its healthcare burden remain limited.
- We quantified healthcare utilisation, hospital costs and predictors of resource use using the National Quality Assurance and Improvement System (NQAIS) [1].

Methods

- A multicentre retrospective cohort study using national administrative data (NQAIS Clinical).
- Episodes of care with a principal diagnosis of PJI (ICD-10-AM code T84.5) between 2018 and 2024 were identified.
- Inpatient cost data were derived from diagnosis-related group (DRG)-based activity-based funding data for 2022–2024 and adjusted to 2024 euro values using inflation data from the Central Statistics Office (CSO).
- Regression analyses were performed to identify predictors of healthcare utilisation and cost.

Patient characteristics	N [IQR] (%)
Total episodes of care	2950
Median age [IQR]	71 [15]
<50	194 (7%)
50-59	387 (13%)
60-69	791 (27%)
70-79	1068 (36%)
80-89	451 (15%)
90+	59 (2%)
Male sex	1667 (57%)
Smoker	707 (24%)
Diabetes	396 (13%)
CKD	102 (3%)
Charlson Comorbidity Index	
No comorbidity	2291 (78%)
Mild (1-2)	9 (<1%)
Moderate (3-4)	306 (10%)
Severe (5+)	344 (12%)
Index joint	
Hip	1089 (37%)
Knee	786 (27%)
Unspecified joint	970 (33%)
Shoulder	65 (2%)
Ankle	25 (1%)
Elbow	15 (<1%)
Mortality	52 (2%)

Table 1: Baseline demographics and clinical characteristics of patients with periprosthetic joint infection.

Episode of care characteristics	N (%), Median [IQR]
Admission source	
Home	2467 (84%)
Inter-hospital transfer	393 (13%)
Nursing/convalescent home	86 (3%)
Other	4 (<1%)
Admission type	
Elective	1204 (41%)
Emergency	1746 (59%)
Length of stay (days)	
Median	14 [5-27]
Bed-days (sum)	68591.5
Critical care	
Any critical care	417 (14%)
Critical-care LOS	2 [1-3]
Mortality	52 (2%)
Discharge destination	
Home	2233 (75%)
Inter-hospital transfer	389 (13%)
Nursing/convalescent home	225 (8%)
Death in-hospital	52 (2%)
Other	51 (2%)
30-day readmissions	307 (10%)

Table 2: Characteristics of inpatient episodes of care for periprosthetic joint infection.

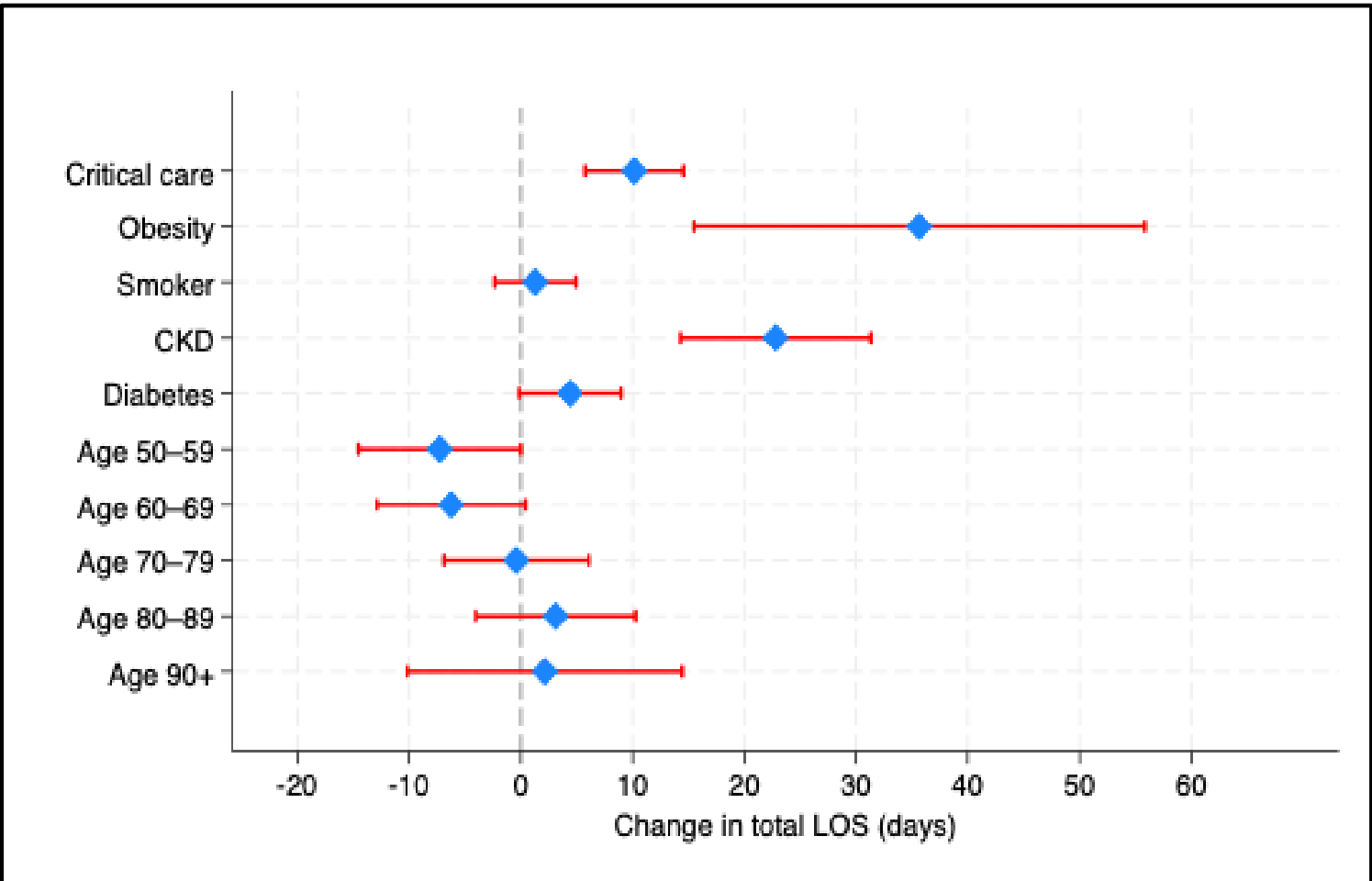


Figure 1: Independent predictors of prolonged hospital length of stay.

	β [95% CI]	P-value
Critical care	10.35 [5.97 – 14.73]	<0.001
Obesity	35.38 [15.21 – 55.55]	0.001
CKD	22.85 [14.34 – 31.36]	<0.001
Diabetes	4.29 [-0.27 – 8.85]	0.065
Age 60–69	-1.48 [-6.00 – 3.05]	0.522
Age 70–79	4.31 [0.04 – 8.58]	0.048
Age 80–89	7.74 [2.55 – 12.94]	0.004
Age ≥ 90	6.75 [-4.55 – 18.05]	0.241

Table 3: Adjusted regression coefficients for predictors of hospital length of stay. Model $R^2 = 0.030$.



Results

National burden:

- Between 2018 – 2024 there were a total of 2,950 inpatient episodes of PJI.
- Median age was 71 years (interquartile range [IQR] 15 years), and 57% were male.
- Median LOS was 14 days (IQR 5–27 days), accounting for 68,592 bed-days nationally.
- Critical care admission occurred in 14% of cases, with a median LOS of two days.
- Obesity and smoking were independently associated with an increased odds of critical care admission.
- 30-day readmission occurred in 10.4%, most commonly due to recurrent infection (57%).

Cost analysis:

- Between 2022 - 2024, 1,488 episodes analysed for cost.
- Total inpatient expenditure was €37 million, with a mean cost per episode of €24,889 (standard deviation €29,678).
- The mean cost per inpatient day was €1,099.
- Critical care admission, CKD and obesity independently predicted longer hospital stay
- Hospital costs increased with longer length of stay. Severe comorbidity (β €20,981, $p < 0.001$) and emergency admission (β €6,305, $p < 0.001$) were the strongest independent predictors of increased cost.

	β [95% CI]	P-value
Univariate model		
Emergency Admission	€7,665.95 [4,591.23 – 10,740.68]	<0.001
Age (years)	€229.09 [94.56 – 363.63]	0.001
Sex (Male)	€-804.16 [-3,993.52 – 2,385.20]	0.621
Charlson score	€6,065.62 [4,607.88 – 7,523.36]	<0.001
Multivariate model		
Age	€68.14 [-66.66 – 202.95]	0.322
Sex (Male)	€-642.12 [-3,589.96 – 2,305.72]	0.669
Charlson Mild	€10,886.98 [-11,158.03 – 32,932.00]	0.333
Charlson Moderate	€4,059.92 [-608.19 – 8,728.03]	0.088
Charlson Severe	€20,981.81 [15,840.83 – 26,122.79]	<0.001
Emergency Admission	€6,305.42 [3,271.76 – 9,339.08]	<0.001

Table 4: Univariate and multivariate predictors of inpatient cost following periprosthetic joint infection. Model $R^2 = 0.068$.

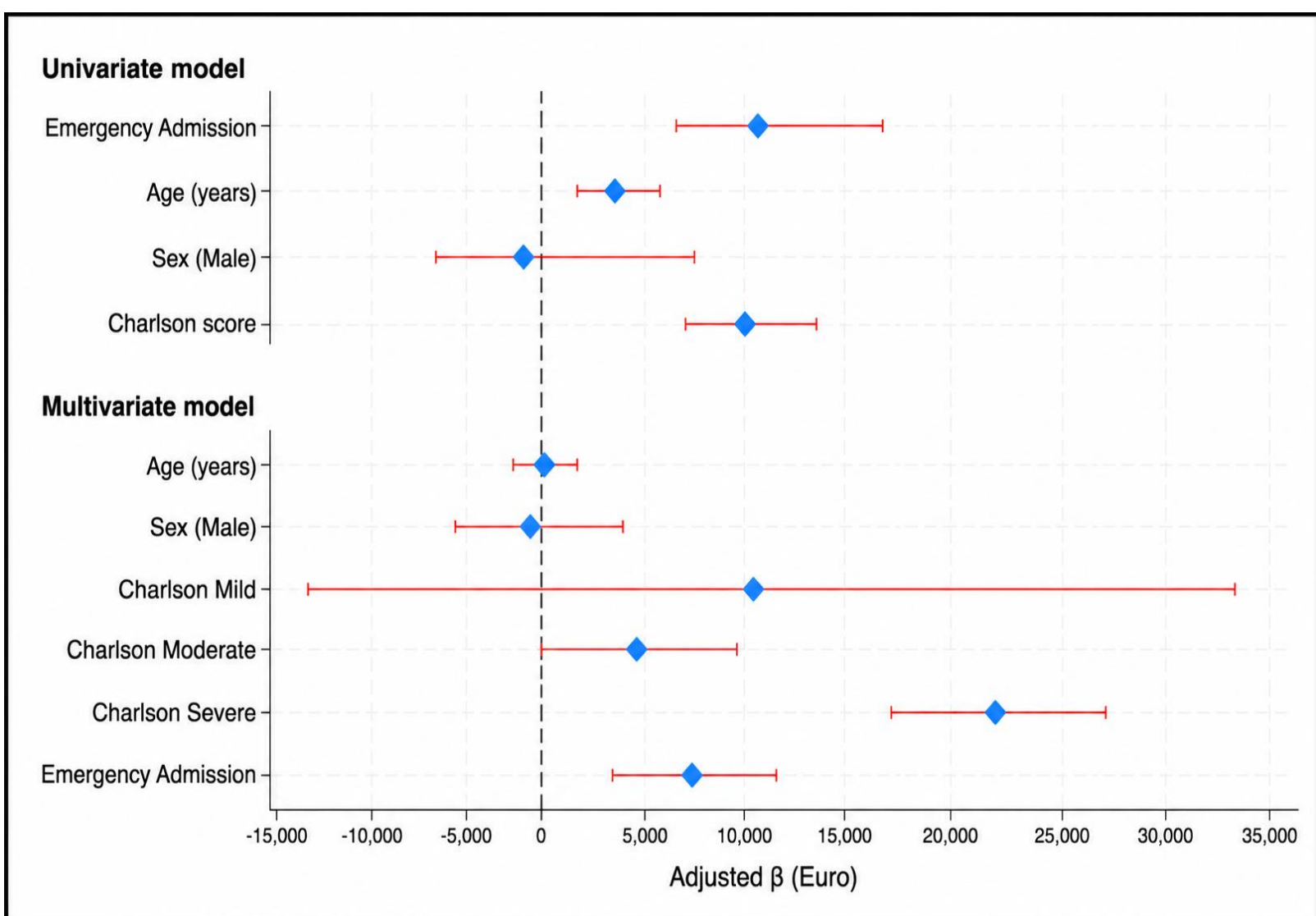


Figure 2: Regression analysis of predictors of inpatient cost.

	OR [95% CI]	P-value
Obesity	3.89 1.44–10.56	0.008
Smoker	2.13 1.70–2.66	<0.001
CKD	1.33 0.79–2.24	0.282
Diabetes	1.17 0.87–1.58	0.287
Male sex	1.09 0.88–1.35	0.455
Age 50–59	1.01 0.60–1.69	0.970
Age 60–69	1.23 0.77–1.95	0.391
Age 70–79	1.16 0.73–1.83	0.523
Age 80–89	1.17 0.71–1.94	0.537
Age ≥ 90	0.86 0.33–2.24	0.763

Table 5: Adjusted odds ratios for predictors of critical care admission.

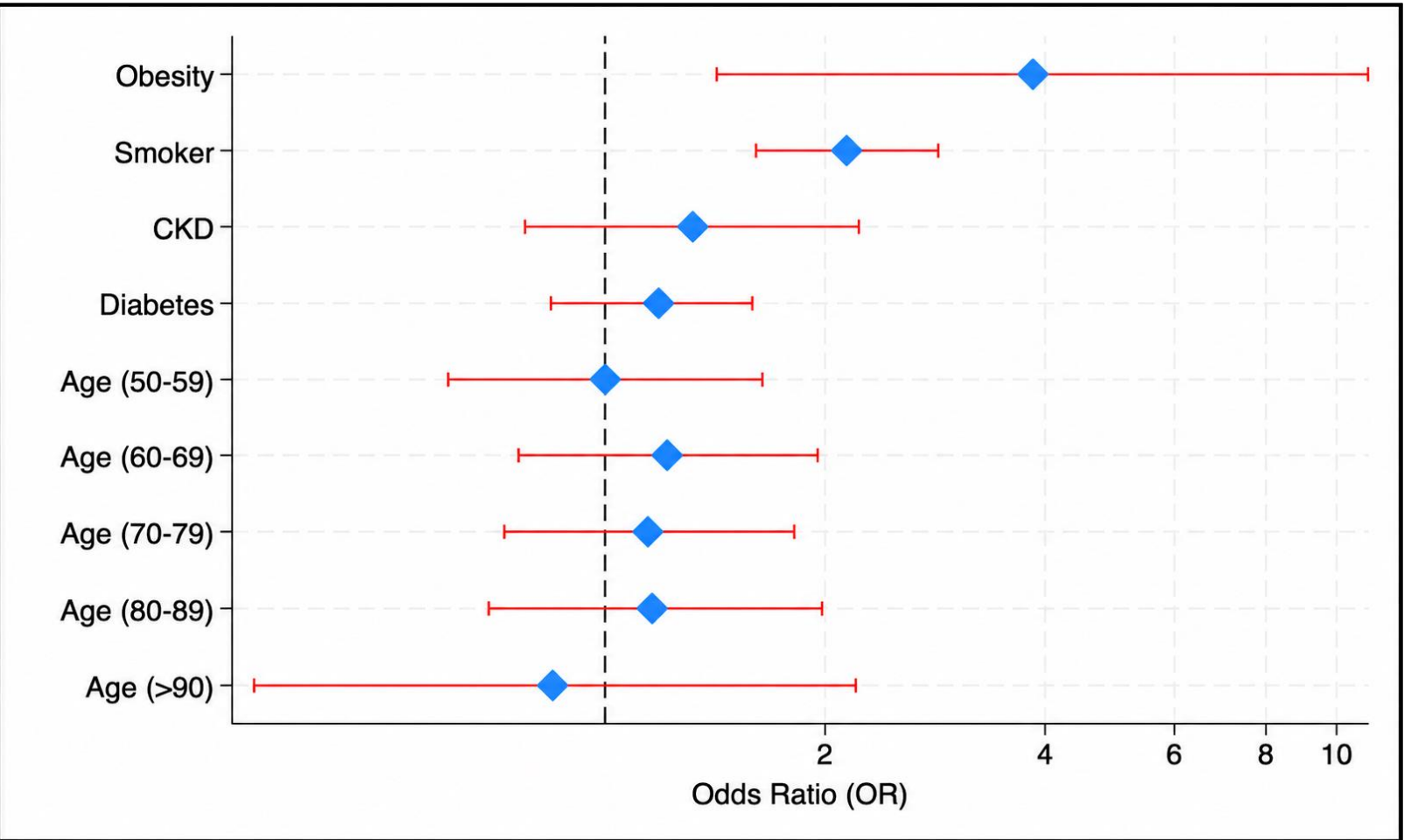
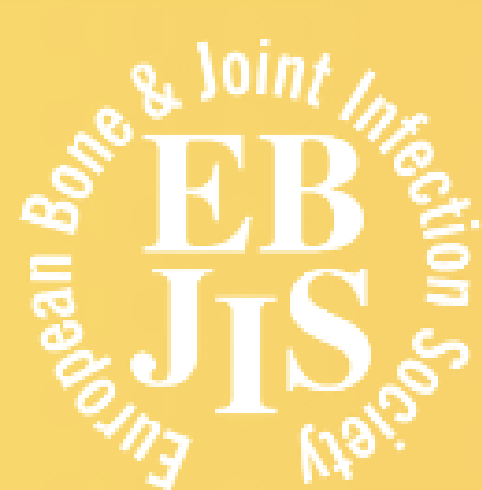


Figure 3: Adjusted odds ratios for predictors of critical care admission.

Conclusions

- PJI imposes a substantial burden on Irish public hospitals, accounting for 68,592 inpatient bed-days (9,799 annually) and an average of €12.3 million in direct inpatient expenditure per year, excluding outpatient care, outpatient parenteral antimicrobial therapy (OPAT), rehabilitation and community-delivered services.
- Severe comorbidity and emergency admission were the strongest independent predictors of increased inpatient cost, while critical-care admission, chronic kidney disease and obesity independently predicted prolonged hospitalisation.
- These findings provide the first national benchmark of healthcare utilisation and inpatient costs associated with PJI in Ireland and establish a contemporary reference for future clinical, economic and health services research.



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