

Insights into Worldwide Total Joint Arthroplasty Registries: A Review and Analysis of Data Capture and Procedure Volume

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INTRODUCTION:

Joint arthroplasty registries serve as essential tools for implant surveillance, quality improvement, and research. By enabling early detection of implant failures and supporting data-driven practice evolution, these systems have contributed significantly to improved arthroplasty outcomes. However, the scope, completeness, and accessibility of registry data vary substantially across countries. While some alignment exists, a fully standardized set of data elements across registries has yet to be widely adopted, which may limit the potential for consistent global benchmarking. Additionally, there does not exist a resource to inform surgeons of the content of or the volume included in the registries around the world. The purpose of this study was to provide a comprehensive comparison of major international hip and knee arthroplasty registries, focusing on differences in procedural volume, data-collection practices, and reporting capabilities.

METHODS: Eight national and regional arthroplasty registries were analyzed using their most recent annual reports (2023–2024): the UK National Joint Registry (NJR), American Joint Replacement Registry (AJRR), Australian Orthopaedic Association National Joint Replacement Registry (AOANJRR), Swedish Arthroplasty Register, Dutch Arthroplasty Register (LROI), Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI), Norwegian Arthroplasty Register, and New Zealand Joint Registry (NZJR). For each registry, the inception year, cumulative number of primary and revision procedures (including total hip arthroplasty (THA), total knee arthroplasty (TKA), unicompartmental knee arthroplasty (UKA), hip resurfacing, and patellofemoral arthroplasty), and calculated the average annual volume were collected. Assessment was performed to determine whether the registry captured a defined core data set—comprising patient demographics, comorbidities, perioperative complications, revisions, implant details, patient-reported outcome measures (PROMs), fixation method, surgical approach, and patellar resurfacing in TKA. Assessment was also performed to determine the presence of advanced features such as individual surgeon-level data, surgeon performance feedback, data availability for external research, and tracking of robotic-assisted surgery.

RESULTS:

Registries varied widely in both scale and data granularity. Cumulative procedure volumes ranged from over 3 million (NJR) to approximately 350,000 (NZJR), with larger national systems typically collecting the highest volumes. MARCQI, a U.S. state-based registry, reports ~473,000 cases. Four registries (AOANJRR, Swedish Arthroplasty Register, MARCQI, NZJR) collected all nine core data elements. AJRR and the Norwegian registry each omitted only one element, while the NJR and LROI demonstrated gaps in core variables—most notably limited comorbidity data and incomplete capture of PROMs (NJR) and surgical approach (LROI). No registry included all four advanced features. Only AOANJRR comprehensively tracked robotic-assisted surgery use; others provided limited or no information. Surgeon-level outcome reporting was uncommon: only MARCQI generated regular confidential feedback reports, while MARCQI and LROI captured individual surgeon data for quality improvement. Access to registry data for external researchers was permitted in five registries (NJR, AJRR, AOANJRR, Swedish Register, NZJR) but was restricted or absent in others.

DISCUSSION AND CONCLUSION:

Global arthroplasty registries exhibit substantial heterogeneity in both scale and data content. While established national programs demonstrate the value of comprehensive data collection, the lack of uniform standards across registries limits direct international comparisons and collaborative research. Our findings highlight both the strengths of current registries (extensive longitudinal data within each system) and their limitations (inconsistent inclusion of key variables and advanced features). There is a strong rationale for international collaboration to harmonize registry data elements and definitions, share best practices, and expand capabilities such as tracking new technologies and providing surgeon-level feedback. By moving toward more standardized and complete data collection worldwide, arthroplasty registries can collectively contribute more effectively to improved implant surveillance, facilitate multi-center research, and ultimately enhance patient outcomes on a global scale. With the data included in this research, surgeons will be able to determine which of the largest worldwide registries is best to answer their clinical questions.

Annual Report (Year)	Year Data Collected (Start)	Annual Patient Allocated for Trial	Total Available for Allocation	Total Volume of Data	Total Volume of Data (by Site)						
2019	2019	10,219	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919
2020	2020	10,219	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919
2021	2021	10,219	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919
2022	2022	10,219	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919
2023	2023	10,219	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919
2024	2024	10,219	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919
2025	2025	10,219	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919
2026	2026	10,219	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919
2027	2027	10,219	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919
2028	2028	10,219	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919
2029	2029	10,219	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919
2030	2030	10,219	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919	1,021,919

Feature	NH	AJH	ADONIR	Swedish Anticoagulation Register	LDI	PARCQ	Norwegian Anticoagulation Register	NDR
Preoperative demographic data	●	●	●	●	●	●	●	●
Preoperative comorbidity data	●	●	●	●	●	●	●	●
Preoperative complication data	●	●	●	●	●	●	●	●
Revision cases collected	●	●	●	●	●	●	●	●
Database upload data	●	●	●	●	●	●	●	●
Registry research access (internal)	●	●	●	●	●	●	●	●
Annual report	●	●	●	●	●	●	●	●
Patient-reported outcome measures (PROM)	●	●	●	●	●	●	●	●
Fluorine Type (Quadrant, Uncontrolled, etc.)	●	●	●	●	●	●	●	●
Surgeon Approach Used	●	●	●	●	●	●	●	●
Post-Operative Care	●	●	●	●	●	●	●	●

Feature	NH	AJH	ADONIR	Swedish Anticoagulation Register	LDI	PARCQ	Norwegian Anticoagulation Register	NDR
Preoperative demographic data	●	●	●	●	●	●	●	●
Preoperative comorbidity data	●	●	●	●	●	●	●	●
Preoperative complication data	●	●	●	●	●	●	●	●
Revision cases collected	●	●	●	●	●	●	●	●
Database upload data	●	●	●	●	●	●	●	●
Registry research access (internal)	●	●	●	●	●	●	●	●
Annual report	●	●	●	●	●	●	●	●
Patient-reported outcome measures (PROM)	●	●	●	●	●	●	●	●
Fluorine Type (Quadrant, Uncontrolled, etc.)	●	●	●	●	●	●	●	●
Surgeon Approach Used	●	●	●	●	●	●	●	●
Post-Operative Care	●	●	●	●	●	●	●	●

NH: National Hip Registry, includes data from England, Wales, Northern Ireland, the Isle of Man, and Channel Islands
 AJH: Includes data from the entire State of America
 ADONIR: Includes data from Australia
 Swedish Anticoagulation Register: Includes data from Sweden
 LDI: Includes data from the Netherlands
 PARCQ: Includes data from the Royal Free Hospital, United States
 Norwegian Anticoagulation Register: Includes data from Norway
 NDR: Includes data from New Zealand

●: Feature is available or available with some limitations
 ○: Feature is not available

●: Feature is available or available with some limitations
 ○: Feature is not available
 *Data, unaggregated data specific to a single surgeon, including procedure volume, patient demographics, and outcomes, used for personal assessment or research.
 **Aggregated summary of performance metrics across multiple surgeons, benchmarked against institutional or national averages to provide comparative insights and identify trends.