

Administrative Databases in Sports Medicine Research



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KEYWORDS

- Administrative database • Cohort study • Epidemiology • Incidence rate
- Sports medicine

KEY POINTS

- The use of administrative databases to investigate clinical outcomes is gaining popularity within the sports medicine literature.
- Administrative databases can be broadly categorized into (1) claims-based data and (2) clinical registry-type data.
- They have improved the ability to monitor trends in practice, plan service delivery across health care systems, and detect rare complications after a procedure.
- Understanding the limitations and potential methodological issues inherent to using administrative data mitigates the risk of arriving at erroneous conclusions.

INTRODUCTION

Administrative databases are large repositories of data maintained by hospitals, health maintenance, or insurance organizations and are intended to monitor health care utilization.¹ Administrative data typically consist of billing, organizational, or system-level patient care data. Although administrative databases were not designed for observational research, the data typically allow for the investigation of regional trends, health care utilization, and outcomes of surgical intervention.² With the growing use of large administrative databases within the orthopedic literature, prospective researchers and consumers of this research must understand a database's characteristics, because this informs appropriate research questions and dictates the internal and external validity of the data.³

By their nature, all databases comprise retrospectively collected data and are unable to report clinically meaningful information in real time. The lag time between a patient encounter with a health care organization, system, or worker (eg, physician)

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and when the data produced from that encounter are available for analysis is occupied by data recording, verification, and cleaning. Common data categories include patient demographics, patient comorbidities, procedural information, diagnostic coding, and costs. The degree of detail and comprehensiveness is variable between data sets and, therefore, dictates the bias inherent to the study results.

Administrative databases are often confused with registries, which similarly are often confused with prospective cohorts. It is important to understand the distinction and nuances between these study types, because the granularity of data on a patient or a specific procedure/intervention level varies. Clinical registries contain large amounts of data on patient outcomes based on specific diagnoses or after common procedures (eg, hip or knee arthroplasties) with the goal of using the data to improve patient safety and health care quality.^{2,4} A registry can reflect population-level outcomes when participation and completion rates are high. In sports medicine, registries for ligament reconstruction have recently been introduced,^{5,6} providing information on survival (ie, time to revision) of the index operation.

Cohorts and administrative databases in some ways fit on the opposite ends of the observational study spectrum. Prospective cohorts are smaller but contain more detailed information, including patient-reported outcome measures (PROMs), which make them a valuable tool to understand who benefits most from a certain treatment. Administrative databases, however, are much larger and contain information on numerous procedures/interventions, but the outcomes available are typically binary (ie, Has an event occurred: yes or no?). Therefore, administrative databases are often best suited to evaluate complications of interventions, practice patterns, and incidence of disease. **Table 1** outlines some of the basic conceptual differences between registries, cohorts, and administrative databases.

This review focuses on administrative databases used in sports medicine research to better elucidate the types or categories of administrative data, their advantages and limitations, and some novel study designs that are possible.

TYPES OF DATABASES

One proposed classification of administrative databases is differentiating between 2 broad categories: claims-based data² and clinical registry-type data.⁴ This differentiation can help identify what type of information is available for study. Most covariates (ie, explanatory variables) and outcomes that can be examined in administrative databases are binary—yes/no; however, some data may be continuous (eg, age

Table 1
A comparison of clinical registries, large cohorts, and administrative databases

	Registry	Cohort	Admin Database
Sample size (N)	1000s+	100s–1000s	1000s+
Number of interventions	Usually <5	Usually <5	No limit
Formulated for outcomes research?	Yes	Yes	No
PROM included	Variable	Yes	No
Radiographic data included	Variable	Yes	Variable
Generalizability	High	Based on design (no. of centers) and size	High
Follow-up	Excellent (if mandated)	Variable	Variable

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