

**ABSTRACT**

# Using administrative databases to identify cases of chronic kidney disease: a systematic review

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**Objective**

This poster summarizes a systematic literature conducted to (1) describe published methods for researching chronic kidney disease (CKD) in administrative databases and (2) summarize the reported validity of methods of searching for CKD in administrative databases.

**Introduction**

CKD is currently the ninth leading cause of death in the United States. The prevalence of end-stage renal disease, the most severe form of CKD, has doubled in the last decade.<sup>1</sup> Early detection and treatment of CKD is critical to slowdown the progression of the disease and to decrease the risk of other chronic conditions, such as cardiovascular disease.<sup>2</sup> One accessible and cost-effective method for health research activities involves use of medical administrative databases, such as insurance claims databases and institutional medical record systems. Individuals with diabetes, for example, have been accurately identified in Medicare and Veterans' Health Administration databases using clearly defined and highly valid search algorithms.<sup>3</sup> However, little is known about the validity of administrative databases for identifying CKD. A systematic review of the literature was conducted to identify the validity of published methods for searching administrative databases for cases of CKD.

**Methods**

Publications were identified through use of Medline, Cochrane Library, EMBASE, EconLit, Cumulative Index to Nursing and Allied Health, and Web of Knowledge. Articles were included if they were published in peer reviewed journals, constituted original research, focused on adults aged 18 years or older, contained some description of the search algorithm used to identify CKD within an administrative database, and were written in or translated into

English. Case studies, news or magazine articles, or clinical articles were excluded. A multiphase process was implemented to review and determine final relevancy of each identified article. The content of all relevant articles was recorded in an Excel-based data abstraction form.

**Results**

The literature review yielded 38 articles that described methods for identifying CKD in a wide variety of administrative databases (that is, electronic medical record systems, Veteran's Administration files, Medicare claims databases, health management organization claims databases, and disease registries). Algorithms were identified for general CKD, stages 3–5 CKD, renal failure, and diabetic nephropathy. Most of the identified algorithms used International Classification of Diseases, 9th Revision (ICD-9) diagnostic codes as the algorithms' foundation. Algorithms for Stages 3–5 CKD, however, relied on laboratory serum creatinine values converted to estimated glomerular filtration rates rather than ICD-9 codes. There was wide variation in the performance of published algorithms. Overall, the algorithms found for general CKD, renal failure, and diabetic nephropathy tended to demonstrate high specificity but lower sensitivity.

**Conclusions**

Historically, ICD-9 codes have not differentiated between the five stages of CKD, but new stage-specific ICD-9 codes were introduced in 2005. Our literature review did not identify any validated ICD-9 algorithms for stage-specific CKD; both the frequency of use and validity of these new codes are unclear. Researchers should focus on search methods and algorithms that match their own working definition of CKD, have been validated in similar databases, and have been used with similar patient populations. The high specificity and lower sensitivity of the algorithms suggest

that the algorithms might, for research studies and to assess the quality of care, identify cohorts of individuals with CKD, but would not perform well for surveillance purposes.

### Acknowledgements

This paper was presented as a poster at the 2010 International Society for Disease Surveillance Conference, held in Park City, UT, USA, on 1–2 December 2010.

### References

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