

Feasibility of identifying demographic and clinical insights for patients with chronic kidney disease from real-world data

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BACKGROUND

- Chronic kidney disease (CKD) is one of the top 10 causes of death in the United States (US).
- CKD affects 37 million people (15% of adults) in the US, with approximately 808,000 living with kidney failure, 556,000 currently on dialysis, 250,000 having received a kidney transplant, and another 90,000 on the transplant waiting list¹.
- Incidence of CKD is rising fast in recent years, with approximately 135,000 newly diagnosed patients in 2021¹.
- Studies assessing disease burden related to CKD are limited.
- Due to large sample sizes, real-world data (RWD) have the potential to provide insight into CKD patients.

OBJECTIVES

- This study aimed to assess the feasibility of obtaining complete CKD burden information in adult patients with stage 4 or 5 CKD using two US RWD sources: a claims database, and an electronic medical record (EMR) network.

METHODS

Data Sources

- Two data sources were utilized for this study:
 - Komodo's Healthcare Map™ (**Komodo**), a US claims database consisting of Medicare, Medicaid, commercial, pharmacy, medical, and laboratory claims²
 - TriNetX**, LLC, a global EMR database consisting mostly of academic medical institutions³.

Analysis

- Stage 4 or 5 CKD patients (≥18 years) were identified using ICD-10-CM diagnosis codes (N18.4, N18.5, I12.0, I13.11, I13.2, Z49, Z99.2) between 01 Jan 2018 and 15 Feb 2023.
- Across both RWD sources, the following was assessed:
 - Unique patient counts
 - Data availability and completeness (see legend **Table 1** for details):
 - Demographics
 - Clinical characteristics and comorbidities
 - Laboratory information
 - Major adverse cardiovascular events (MACE)
 - Treatment-related adverse events (AE)

RESULTS

- Komodo included 4,513,897 and TriNetX 1,310,974* CKD patients **Patient counts have increased due to additional data sources in the TriNetX Network since the abstract submission.*
- Most patients were between 65-88 years old (**Figure 1A**), with age data >99% complete in both RWD sources (**Table 1**).
- Slightly more CKD patients were male (52% in Komodo and 51% in TriNetX; **Figure 1B**) with data ≥95% complete in both RWD sources.
- Race and ethnicity data were available in both RWD sources, with 86% and 75% complete in TriNetX, respectively (not freely available for completeness assessment from Komodo).
- Both sources had clinical characteristics, comorbidities, concomitant medications, and outcome data (AE, MACE; without causality) readily available (see legend **Table 1** for variable details).
- Laboratory results were readily available in TriNetX and with data linkage in Komodo.
- Checking for completeness of clinical characteristics, comorbidities, concomitant medications, laboratory results, and outcome data (AE, MACE) would require derivation and/or linkage to other data sources via tokenization in both RWD sources.
- The top diagnosis for this cohort was CKD stage 4 (severe) and diseases of the genitourinary system for both RWD sources.
- The number of healthcare organizations queried within each data source varied, (Komodo: 157,153; TriNetX: 64).

Figure 1. Patient Demographics

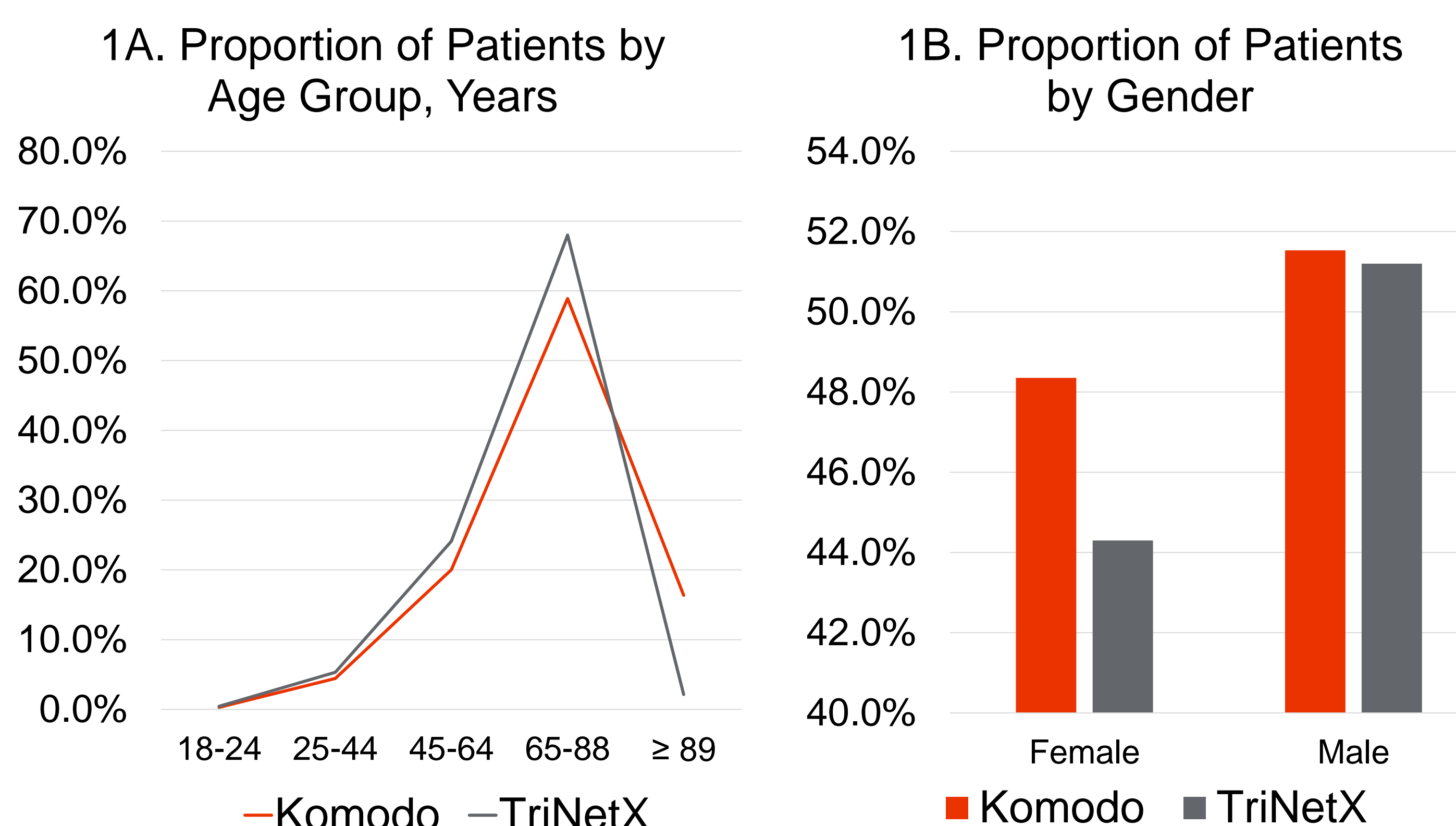


Table 1. Available Variables

Variable	Komodo	TriNetX
Age	✓	✓
Gender	✓	✓
Race	†	✓
Ethnicity	†	✓
Concomitant medications	✓	✓
Clinical characteristics	✓	✓
Laboratory results	¥	✓
Comorbidities	✓	✓
Outcome Data (AE, MACE)	✓	✓

✓ Available, completeness may vary; † Available for purchase; ¥ Available via data linkage
 Clinical characteristics included payer type, procedures, treatments, symptoms and diagnoses
 Laboratory results include the assay ordered and the most recent results
 Comorbidities include other diseases or conditions the patient has been diagnosed with
 Data sourced from Komodo Health, Inc. and TriNetX, LLC

CONCLUSIONS

- We were able to determine availability of demographic and clinical insights to CKD patients across two RWD sources, with availability and completeness varying by source.
- Age and gender distributions in both sources were comparable to known late-stage CKD characteristics⁴.
- Despite limitations for assessing treatment outcomes, there is a large enough patient pool in both Komodo and TriNetX to provide insight into CKD disease burden, which may aid in real-world evidence study planning and drug development.

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