Characterization of Chronic Kidney Disease Patients by eGFR Status Using Health Insurance Claims Linked to Lab Testing Data

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Introduction

- Chronic kidney disease (CKD) is a highly prevalent condition in the US that is defined by damage to the kidney that affects its filtration capabilities.[1]

- People with CKD can be at risk for complications such as anemia, reduced red blood cell survival, and mineral bone disease.[1]

- Currently, ICD-based definitions for identifying CKD patients are more accurate for defining later-stage disease (i.e., CKD stages 3-5), where earlier identification can be critical for catching patients before severe progression.[2]

Objective

- To characterize gender and race and ethnicity of chronic kidney disease (CKD) patients by estimated glomerular filtration rate (eGFR) status using US claims linked with lab data.

Methods

Study Design

- A retrospective study design of a US-claims-based dataset, the Komodo Healthcare Map™, consisting of 330 million patient lives, was used. The Komodo Healthcare Map was supplemented by linking Komodo Lab Results (KLR) for estimated glomerular filtration rate (eGFR) labs.

- The 5 stages of CKD were defined by the National Kidney Foundation (NKF) based on eGFR levels.

  - Stage 1: eGFR 90-150
  - Stage 2: eGFR 60-89
  - Stage 3a: eGFR 45-59
  - Stage 3b: eGFR 30-44
  - Stage 4: eGFR 15-29
  - Stage 5: eGFR <15
  - Hyperfiltration: eGFR >150

- Demographic information, including race and ethnicity, gender, and geographical region, were evaluated within the period studied. Geographical regions were defined by the US Census Bureau.

Inclusion/Exclusion Criteria

- Patients were included if they met the following criteria:

  - At least one claim-confirmed diagnosis of chronic kidney disease as evidenced by corresponding ICD-10-CM code within the time frame of January 1, 2021, to December 31, 2022 (D63.1, E08.22, E09.22, E10.22, E11.22, E13.22, I12*, I13*, N18*, O10.2*, O10.3*)

  - At least one lab test measuring eGFR within the same time frame

  - Patient met the criteria of being payer-complete, closed (Mx and Rx) during this time period

Results

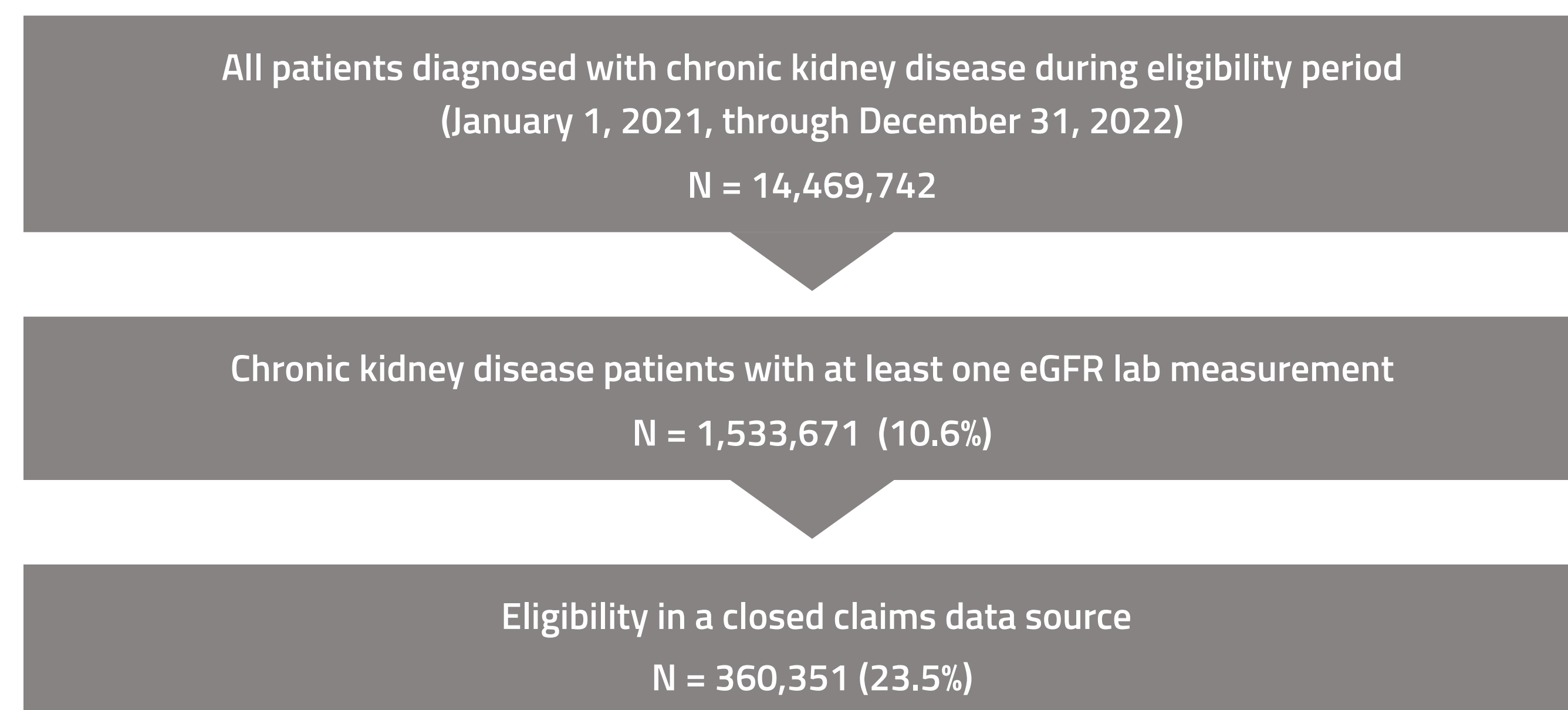### Figure 1. Patient Identification Flowchart

All patients diagnosed with chronic kidney disease during eligibility period
(January 1, 2021, through December 31, 2022)
N = 14,469,742

Chronic kidney disease patients with at least one eGFR lab measurement
N = 1,533,671 (10.6%)

Eligibility in a closed claims data source
N = 360,351 (23.5%)

Table 1. Patient Characteristics

	Asian or Pacific Islander	Black or African American	Hispanic or Latino	Other	White
Total Patients	23,321	56,990	57,478	9,059	17,3764
Stage 5	1,076	5,054	3,303	541	7,507
Stage 4	2,516	9,856	6,470	1,089	24,825
Stage 3b	5,410	18,543	13,802	2,238	59,000
Stage 3a	8,943	25,460	22,819	3,711	88,289
Stage 2	11,475	23,847	28,890	4,143	79,446
Stage 1	6,450	8,668	15,628	2,213	26,952
Hyperfiltration	134	235	295	43	544

Table 2. Geographical Breakdown by eGFR

	Midwest	Northeast	South	West
Total Patients	51,431	125,677	129,6083	80,756
Stage 5	3,123	6,465	7,446	4,239
Stage 4	7,929	19,993	16,749	9,397
Stage 3b	15,408	45,136	35,490	20,904
Stage 3a	22,802	65,465	55,974	34,714
Stage 2	23,174	55,443	62,414	37,460
Stage 1	9,418	21,165	26,823	16,776
Hyperfiltration	360	501	340	361

Table 3. Gender Breakdown by eGFR

	Female	Male
Total Patients	183,584	176,755
Stage 5	9,388	10,331
Stage 4	26,457	23,036
Stage 3b	58,899	49,883
Stage 3a	85,450	82,016
Stage 2	81,620	86,061
Stage 1	34,953	34,135
Hyperfiltration	873	633

Of the patients identified with closed Komodo claims and eGFR lab values, 69,092 (12%) were stage 1 (eGFR 90-150), 167,684 (29%) were stage 2 (eGFR 60-89), 276,254 (47%) were stage 3 (eGFR 30-59), 49,495 (8%) were stage 4 (eGFR 15-29), 19,719 (3%) were stage 5 (eGFR <15), and 1,506 (0.3%) had hyperfiltration (eGFR >150).

For patients with stage 5 eGFR levels (eGFR <15), 9,388 (48%) of patients were female and 10,331 (52%) were male, with the following race and ethnicity breakdown: 7,507 patients were White (43%), 5,054 patients were Black (29%), 1,076 patients were Asian (6%), 3,303 patients were Hispanic or Latino (19%), and 541 patients were other (3%).

Conclusion

CKD-diagnosed patients in payer-complete/closed claims data can be augmented with linked eGFR values to understand kidney disease patients by stage to further insights into CKD.

References

1. Webster, A.C., Nagler, E.V., Morton, R.L., Masson P. Chronic Kidney Disease. Lancet. 2017 Mar;389(10075):1238-1252.

2. Paik, J.M., Patorno, E., Zhuo, M., Bessette, L.G., York, C., Gautam N., et al. Accuracy of identifying diagnosis of moderate to severe chronic kidney disease in administrative claims data. Pharmacoepidemiol Drug Saf. 2022 Apr;31(4):467-475.
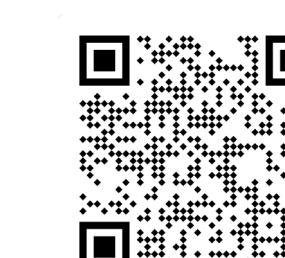
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