

The Utility of a National Surveillance Network to Estimate CKD Prevalence and Identify High-Risk Populations in Primary Care



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Kidney Int Rep (2019) 4, 513–515; <https://doi.org/10.1016/j.ekir.2019.02.002>

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The prevalence of chronic kidney disease (CKD) worldwide is currently estimated at 7.2% to 13.4%.^{1,2} In CKD, symptoms do not manifest until the late stages, and awareness among patients is poor.³ Most patients with CKD are cared for in the primary care setting.⁴ Given that there are known interventions to slow CKD progression, there is a need to identify high-risk patients early in the primary care setting to improve outcomes (Figure 1).

In this issue of *KI Reports*, Bello *et al.* use the Canadian Primary Care Sentinel Surveillance Network (CPCSSN) to determine CKD prevalence and various demographic, geographic, and clinical variations in CKD prevalence in the primary care setting.⁵ The authors highlight the importance of using the CPCSSN to evaluate this question, given the lack of a national CKD surveillance system in Canada. The

study proposes to ascertain the burden of CKD in Canada and to identify high-risk groups to inform future quality improvement and disease surveillance in the primary care setting.

This cross-sectional study evaluates a cohort of patients seen by a provider in the CPCSSN who were at least 18 years of age, with 2 or more measurements of estimated glomerular filtration rate (eGFR) in a 1-year period following the first eGFR measurement in the record. All measurements were ambulatory based. The authors used the CKD Epidemiology Collaboration (CKD-EPI) equation to calculate eGFR from serum creatinine measurements. CKD was defined as an individual having 2 eGFR values of less than 60 ml/min per 1.73 m² more than 90 days apart, with end-stage renal disease being excluded. The authors look at several covariates including age, sex, material deprivation, medications, and comorbid conditions.

Of the baseline cohort of 559,745 individuals, 7.4% met the authors' definition of CKD, with an inverse relationship between prevalence and

disease severity. Demographics associated with a higher prevalence of CKD included increasing age, rural versus urban setting, and material deprivation. In addition, multimorbidity itself, as well as comorbid dementia, diabetes and hypertension, Parkinson's disease, and chronic obstructive pulmonary disease, were also associated with a higher prevalence of CKD.

In the United States, estimates of CKD Stages 3 to 5 in the National Health and Nutrition Examination Surveys, a nationally representative sample of noninstitutionalized adults, was 10.5%, with prevalence declining with increased CKD stage.⁵ Increasing age and the presence of diabetes and hypertension were also found to be associated with a higher prevalence of CKD. The estimated prevalence reported in this study is lower than what has been previously described in the literature. As the authors discuss, this difference could be due to a selection bias of healthier people engaging with primary care or a lack of testing for CKD in those with known risk factors. On the other hand, the requirement for 2 measurements of eGFR 90 days apart in 1 year could have also resulted in a higher prevalence of CKD, as healthy people may not have been tested with such frequency.

The authors found a higher prevalence of CKD in rural versus urban settings, with 18.5% of the cohort living in a rural residence. The authors discuss the possibility of distance and geographic isolation leading to reduced access to care and less risk factor modification in the rural setting. This explanation raises the question as to whether the study actually underestimates the prevalence of CKD in this population, given that rural dwellers may be less likely to present to primary care and be tested. The increased CKD prevalence described in this

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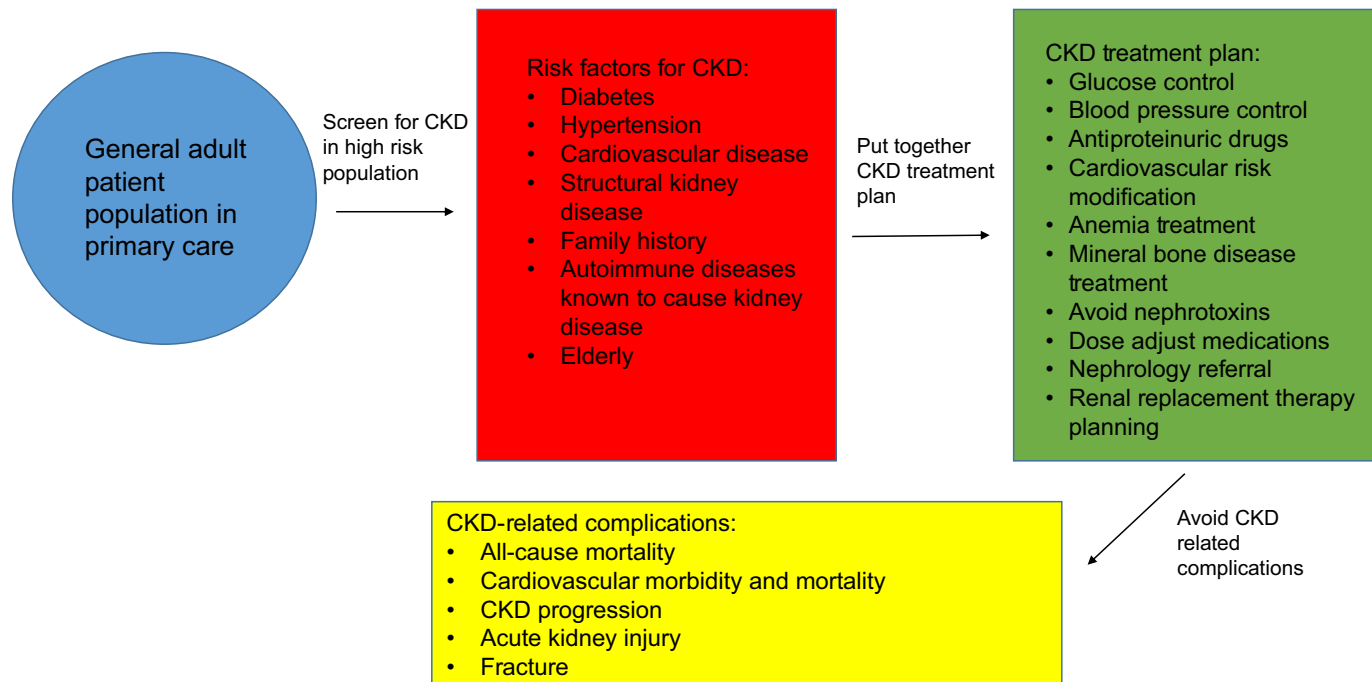


Figure 1. Screening for chronic kidney disease (CKD) in high-risk populations in the primary care setting.

group is concerning, given data showing that CKD care in the rural population is suboptimal. In a cohort of CKD patients cared for in rural primary care practices in the United States, 51.9% had no documentation of CKD in their medical record.⁶ Undocumented CKD was highly associated with not being referred to a nephrologist. A previous Canadian study looking at remote dwellers living more than 50 km from a nephrologist showed that individuals in this population were less likely to receive recommended testing, treatments, and specialty care, and had increased hospitalization and death, compared to those living closer to a nephrologist.⁷

The advantages of the data source are that it covers 8 of 13 provinces and territories in Canada and, in previous literature, was shown to reasonably represent the general primary care population. Furthermore, the network uses validated algorithms to monitor chronic disease using both billing codes and data drawn from diagnoses, testing, and medication prescriptions. The reporting of

medication prescriptions raises the potential to identify care gaps, including the prescribing of nephrotoxic medications. The ability to identify high-risk populations has clear advantages if the future goal is to consider targeted public health initiatives to improve CKD care.

One major limitation of using the CPCSSN for this study is the lack of data on comorbid conditions known to be risk factors for CKD or associated with worse outcomes in CKD. Some examples of these conditions include coronary artery disease, congestive heart failure, cerebrovascular disease, and peripheral arterial disease. In the future, if the goal is to use this data source to improve CKD care, the authors should explore whether the network could add these conditions to the validated algorithm used to identify comorbid conditions.

Most importantly, however, there are no data on proteinuria. The authors explain that proteinuria measurement was not included due to a lack of consistent collection and reporting. Given the lack of proteinuria data, the authors are limited

to defining CKD only by eGFR, rather than using the updated CKD staging system recommended by Kidney Disease: Improving Global Outcomes (KDIGO).⁸ Furthermore, proteinuria is well known to be associated with CKD progression, morbidity, and mortality.⁹ Given the goals to estimate CKD prevalence, to identify high-risk groups, and to evaluate gaps in care, the inability to evaluate proteinuria is a major limitation.

Despite these limitations, this study adds to the literature by giving an estimate of CKD in primary care in Canada. Given the lack of a national CKD surveillance system in Canada, the use of the surveillance network represents a novel and important data source. Because most CKD patients are identified and cared for in the primary care setting, this is a crucial environment in which to evaluate these questions.

This study identifies high-risk groups for CKD, including individuals who are elderly, those with multimorbidity, those with socioeconomic deprivation, and

those living in rural environments. Understanding the burden of CKD in these populations is an important first step to developing strategies to improve CKD care in the primary care setting. In addition to known high-risk populations such as patients with diabetes and hypertension, this study defines other populations in whom primary care practitioners can focus screening. On a public health level, these findings point to the need for alternatives to screening in the primary care office setting, to reach populations who may not interact with the medical system frequently but are known to be at higher risk for CKD. Finally, the higher prevalence of CKD in elderly individuals with multimorbidity points to the need to develop CKD treatment plans in primary care that take into account functional status, heterogeneity of

life expectancy, polypharmacy, and individual health care preferences.

DISCLOSURE

The author declared no competing interests.

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