Michigan BRFS

THE IMPACT OF KIDNEY DISEASE ON THE MICHIGAN ADULT POPULATION

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A NEWSLETTER FROM THE CHRONIC DISEASE EPIDEMIOLOGY SECTION, MDCH

The Burden of Kidney Disease among Michigan Adults

Background. Chronic kidney disease (CKD), sometimes referred to as chronic kidney failure, is defined as the gradual loss of kidney function. Progressive kidney damage can eventually lead to end stage renal disease (ESRD), which requires a kidney transplant or dialysis for survival. Diabetes is the leading cause of kidney failure. In 2011, 44.0% of people starting dialysis had kidney disease caused by diabetes.[1] Cardiovascular disease (CVD), obesity, and, especially, hypertension are also strongly associated with kidney disease.[2] National CKD prevalence estimates among adults 20 years and older were 40.1% among those with diabetes, 23.2% for those with hypertension, 40.8% among those with CVD, and 16.8% for those classified as obese.[2] Currently, there is no statewide registry in Michigan that tracks the number of adults with diagnosed kidney disease (CKD and ESRD combined). The Michigan Behavioral Risk Factor Surveillance System (MiBRFSS) is the only source of population-based data for kidney disease among Michigan adults.

The American Diabetes Association recommends that urine albumin testing be conducted annually to screen for CKD and to monitor kidney disease in patients that have had type 1 diabetes for five years or more or have type 2 diabetes.[3] Serum creatinine levels should also be measured annually among all adults with diabetes regardless of urine albumin excretion.[3] This measurement is used to estimate the glomerular filtration rate of the kidneys and to assess the chronic kidney disease stage, if present.

This brief examines the prevalence of diagnosed kidney disease among the Michigan adult population in relation to various chronic conditions and assesses the status of kidney disease testing among this population.

Methods. Questions related to kidney disease, demographics, and other comorbid conditions were included within the Michigan Behavioral Risk Factor Surveillance System (MiBRFSS) in 2011 through 2013. Additional questions on kidney disease testing were included within the 2013 survey.

Lifetime prevalence of kidney disease was defined as ever being told by a doctor, nurse, or other health professional that you had kidney disease. With exception of the current obesity indicator, all of the other comorbid conditions used within this analysis were also lifetime prevalence indicators. The kidney disease testing questions included within the 2013 MiBRFSS were as follows: "Has your urine been tested for protein or albumin in the last 3 years?" and "Has your blood been tested for a substance called creatinine in the last 3 years?"

These data were used to determine the lifetime prevalence estimates of kidney disease and the current prevalence estimates of kidney disease testing among Michigan adults. Subpopulations based on demographic and comorbid factors were compared to determine if significant differences existed among these kidney disease indicators.

Results. Based on 2011-2013 MiBRFSS data, an estimated 3.1% of Michigan adults (approx. 237,000 adults) were ever told by a doctor, nurse, or other health professional that they had kidney disease (Table 1). Prevalence of kidney disease increased with age, but was similar by race/ethnicity. Females (3.8%) reported a higher prevalence of kidney disease than males (2.4%). Adults with less than a high school education were more likely to report having kidney disease when compared to college graduates (4.1% vs. 2.4%). Adults with health insurance and disabled adults (3.4% and 6.9%, respectively) were more likely to report having kidney disease when compared to their uninsured and non-disabled counterparts (1.5% and 1.8%, respectively).

Table 1. Kidney Disease among Michigan Adults Michigan BRFSS, 2011-2013

	Ever Told Kidney Disease	
	%	95% CI
Total (N = 34,171)	**3.1**	**(2.9-3.4)**
Age		
18-44 years	1.6	(1.3-2.0)
45-64 years	3.4	(3.0-3.8)
65+ years	6.3	(5.8-7.0)
Gender		
Male	2.4	(2.1-2.8)
Female	3.8	(3.5-4.2)
Race/Ethnicity		
White, non-Hispanic	3.1	(2.8-3.3)
Black, non-Hispanic	3.9	(3.0-5.0)
Other, non-Hispanic	2.3	(1.6-3.3)
Hispanic	2.8	(1.6-4.8)
Education		
Less than high school	4.1	(3.1-5.5)
High school graduate	3.6	(3.2-4.0)
Some college	2.9	(2.5-3.3)
College graduate	2.4	(2.1-2.7)
Health Insurance		
Yes	3.4	(3.1-3.7)
No	1.5	(1.1-2.0)
Disability		
Disabled	6.9	(6.2-7.6)
Not disabled	1.8	(1.6-2.0)

MiBRFSS News

- The 2014 MiBRFS data are currently being weighted by the CDC. Revised standard tables can be expected in July or August 2015.
- Data collection for the 2015 MiBRFS started in early January 2015.
- The 2013 MiBRFS standard tables and annual report are available on the MiBRFSS website (www.michigan.gov/brfs).
- Did you miss an issue of *Michigan BRFSS Surveillance Brief?* Back issues are available on our website.

Table 2 reports the lifetime prevalence estimates of kidney disease among various high risk populations. Using MiBRFSS data from 2011 and 2013 combined, the estimated lifetime prevalence of kidney disease among Michigan adults who reported having any of the associated comorbid conditions (i.e., diabetes, hypertension, CVD, and obesity) was 4.3%. When looking at each comorbid condition individually, the prevalence estimates for the hypertensive and CVD populations were comparable (4.0% and 4.1%) and over three times higher than that of the obese population (1.3%). Adults with multiple conditions reported significantly higher lifetime kidney disease prevalence estimates compared to the individual condition populations. Over one in ten adults with all four comorbid conditions also reported kidney disease.

In 2013, an estimated 27.7% of Michigan adults reported being tested for kidney disease in the past 3 years using albumin, creatinine, or both (Table 3). The prevalence of kidney disease testing by both methods combined (17.0%) was significantly higher than either test individually (7.6% and 3.1%, respectively). The prevalence of combined albumin and creatinine testing among adults with diabetes (36.8%) and those with CVD (30.9%) were significantly higher that those with hypertension (25.2%).

Conclusions. Diagnosed kidney disease due to diabetes mellitus (diabetic nephropathy) occurs in 20-40% of patients with diabetes.[3] However, over 50% of adults in Michigan who reported having diabetes did not have either test within the past three years.

During the past 20 years, the odds of having chronic kidney disease among those with diabetes or those with hypertension relative to those without has remained comparable; however, the odds among those with CVD vs. those without has increased by 50%.[2] People with kidney disease represent a population at very high risk for CVD events; furthermore, individuals with CKD are more likely to die of CVD than to transition to ESRD.[4] Furthermore, CVD is the leading cause of death among those with ESRD.[4]

Self–management and health literacy assist adults with chronic disease. For example, Personal Action Toward Health (PATH), Diabetes PATH, and Diabetes Self-Management Education instruct Michigan adults on how to manage chronic disease. The National Diabetes Prevention Program helps prevent high risk persons from developing diabetes and other diabetes-related complications.

Table 2. Kidney Disease among Michigan Adults with Comorbid Conditions Michigan BRFSS, 2011 and 2013 Combined

	Ever Told Kidney Disease
	% (95% CI)
Diabetes, hypertension, CVD or obesity	4.3 (3.9-4.8)
Diabetes only	--[a,b]
Hypertension only	4.0 (3.1-5.0)[b]
CVD only	4.1 (2.4-7.1)[b]
Obesity only	1.3 (0.8-1.9)[b]
Diabetes and hypertension only	7.0 (5.0-9.9)[b]
Diabetes, hypertension, and obesity only	8.3 (6.2-10.9)[b]
All four comorbid conditions	12.4 (8.7-17.2)[b]

[a] Suppressed due to an N < 50 and/or a relative standard error of > 30%.
[b] Population excludes those who reported any of the other conditions.

Table 3. Prevalence of Kidney Disease Testing Michigan BRFSS, 2013

	%	95% CI
Only urine albumin tested in past 3 years	**7.6**	**(6.8-8.4)**
Ever told diabetes	8.3	(6.4-10.6)
Ever told hypertension	7.4	(6.3-8.6)
Ever told cardiovascular disease	7.9	(5.8-10.7)
Obesity	8.6	(7.1-10.3)
Only serum creatinine tested in past 3 years	**3.1**	**(2.6-3.5)**
Ever told diabetes	1.9	(1.1-3.3)
Ever told hypertension	3.7	(2.9-4.6)
Ever told cardiovascular disease	3.7	(2.9-4.6)
Obesity	3.3	(2.5-4.4)
Both albumin & creatinine tested in past 3 years	**17.0**	**(16.0-18.0)**
Ever told diabetes	36.8	(33.0-40.8)
Ever told hypertension	25.2	(23.4-27.1)
Ever told cardiovascular disease	30.9	(27.3-34.7)
Obesity	19.4	(17.6-21.3)

References

[1] Centers of Disease Control and Prevention. National Diabetes Statistics Report: Estimates of diabetes and its burden in the United States, 2014. Atlanta, GA: US Department of Health and Human Services; 2014.
[2] U.S. Renal Data System, USRDS 2013 Annual Data Report: Atlas of Chronic Kidney Disease and End-Stage Renal Disease in the United States, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, 2009.
[3] American Diabetes Association: Clinical Practice Recommendations 2014. Standards of medical care in diabetes—2014. Jan 2014; 37 (Supplement 1):S14-S80.
[4] Mozaffarian D, et al.; on behalf of the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics - 2015 update: a report from the American Heart Association. Circulation. 2015; 131:e29-e322.

The Michigan Behavioral Risk Factor Surveillance System (MiBRFSS)

The MiBRFSS comprises annual, statewide telephone surveys of Michigan adults aged 18 years and older and is part of the national BRFSS coordinated by the CDC. The annual Michigan Behavioral Risk Factor Surveys (MiBRFS) follow the CDC BRFSS protocol and use the standardized English core questionnaire that focuses on various health behaviors, medical conditions, and preventive health care practices related to the leading causes of mortality, morbidity, and disability. Landline and cell phone interviews are conducted across each calendar year. Data are weighted to adjust for the probabilities of selection and a raking weighting factor that adjusts for the distribution of the Michigan adult population based on eight demographic variables. All analyses are performed using SAS-callable SUDAAN® to account for the complex sampling design.

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