



Michigan BRFS

# MICHIGAN BRFS SURVEILLANCE BRIEF

A NEWSLETTER FROM THE CHRONIC DISEASE EPIDEMIOLOGY SECTION, MDCH

## The Burden of Stroke and Hypertension among Michigan Adults

**Background.** Stroke is a cardiovascular disease that occurs as a result of decreased blood supply to the brain. This condition results when a blood vessel in the brain is obstructed by a clot or ruptures. It is the number one cause of disability and the fourth leading cause of death in both the United States and Michigan.<sup>1</sup>

High blood pressure or hypertension is a common yet preventable condition that increases the risk of stroke. Less than half of U.S. adults with hypertension have their blood pressure adequately controlled, and, among those with uncontrolled hypertension, 40% (14 million people) do not know they have it.<sup>2</sup> Long-term blood pressure control improves outcomes among acute ischemic stroke cases and prevents recurrent strokes. A 12-point reduction in high blood pressure can reduce the risk of stroke by 37%.<sup>3</sup>

Risk of stroke also increases with history of comorbid conditions such as diabetes, myocardial infarction (i.e., heart attack), and coronary heart disease.<sup>4</sup> The prevalence of cardiovascular comorbidities and history of high blood pressure among Michigan stroke survivors has not been reported previously.

**Methods.** Questions related to stroke, hypertension, and the use of hypertensive medications were included within the 2013 Michigan Behavioral Risk Factor Survey (MiBRFS). Additional questions on comorbid conditions and respondent demographics were also included within the 2013 survey.

Lifetime prevalence of stroke and hypertension were defined as ever being told by a doctor, nurse, or other health professional that you had a stroke or had high blood pressure (i.e., hypertension). Females who had high blood pressure only during pregnancy and adults who indicated they were pre-hypertensive were coded as not having been told they had hypertension. Adults who were ever told they had hypertension were asked a follow-up question to determine if they were currently taking medicines for their hypertension.

These data were used to determine the lifetime prevalence of stroke among Michigan adults, the lifetime prevalence of hypertension among Michigan adults who ever had a stroke, and current hypertension medication use among Michigan adults who ever had both a stroke and hypertension. Subpopulations based on demographic and comorbid factors were compared to determine if significant differences existed among these stroke and hypertension indicators.

**Results.** In 2013, 3.6% of Michigan adults reported ever being told by a doctor, nurse, or other health professional that they had a stroke (Table 1). The lifetime prevalence of stroke increased with age and decreased with increasing household income level. Furthermore, Black adults were more likely to have ever been

**Table 1. Stroke, Hypertension, and Hypertension Medication Use among Michigan Adults, 2013 Michigan BRFS**

	Ever Told Stroke		Ever Told Hypertension (Among Ever Told Stroke)	
	%	95% CI	%	95% CI
<b>Total</b>	<b>3.6</b>	<b>(3.2-4.0)</b>	<b>69.7</b>	<b>(63.7-75.0)</b>
<b>Age</b>				
18-44 years	1.2	(0.8-1.7)	-- <sup>a</sup>	-- <sup>a</sup>
45-54 years	2.9	(2.1-4.1)	65.1	(48.6-78.7)
55-64 years	5.3	(4.2-6.6)	76.1	(64.9-84.6)
65-74 years	6.4	(5.1-8.1)	74.4	(60.6-84.7)
75+ years	10.8	(9.0-12.8)	85.3	(78.3-90.3)
<b>Gender</b>				
Male	3.7	(3.1-4.4)	70.8	(61.7-78.5)
Female	3.5	(3.0-4.1)	68.6	(60.6-75.6)
<b>Race</b>				
White	3.3	(2.9-3.7)	68.5	(61.9-74.5)
Black	5.0	(3.7-6.8)	75.3	(58.7-86.7)
Other	4.8	(2.8-8.2)	-- <sup>a</sup>	-- <sup>a</sup>
<b>Household Income</b>				
Less than \$25,000	6.1	(5.1-7.3)	67.8	(58.0-76.2)
\$25,000 - \$49,999	4.9	(3.9-6.1)	74.9	(63.1-83.9)
\$50,000 or more	1.4	(1.1-1.8)	66.3	(53.5-77.0)
<b>Health Insurance</b>				
Yes	3.8	(3.4-4.3)	71.4	(65.3-76.8)
No	2.6	(1.6-4.0)	-- <sup>a</sup>	-- <sup>a</sup>

<sup>a</sup> Suppressed due to a denominator < 50 and/or a relative standard error > 30%.

### MiBRFS News

- The 2013 MiBRFS annual tables are now available on the MiBRFS website ([www.michigan.gov/brfs](http://www.michigan.gov/brfs)). These tables include 2013 estimates by demographics and 2011-2013 estimates by expanded race/ethnicity, region, and local health department.
- The 2013 MiBRFS Annual Report will be distributed in September or October 2014.
- Did you miss an issue of *Michigan BRFS Surveillance Brief*? Back issues are available on our website.

told they had a stroke than White adults.

Overall, 34.6% of Michigan adults reported ever being told by a doctor, nurse, or other health professional that they had hypertension (data not shown). Among adults who ever had a stroke, 69.7% also reported ever being told they had hypertension (Table 1). The lifetime prevalence of hypertension among adults with stroke increased with age, but was similar for all other demographic factors. Furthermore, 85.4% of Michigan adults who ever had a stroke and hypertension were currently taking medications for their hypertension (data not shown).

Adults who were ever told they had a stroke and another comorbid condition were generally more likely to have also been diagnosed with hypertension at some point in their life when compared to those diagnosed with stroke only (Table 2). For example, adults who were ever diagnosed with both stroke and diabetes and adults ever diagnosed with stroke and a combination of diabetes, heart attack, or coronary heart disease reported higher lifetime prevalences of hypertension than adults diagnosed with stroke only (88.4% and 83.5% vs. 69.7%).

**Conclusions.** The lifetime prevalence of hypertension among Michigan adults was notably higher among those who ever had a stroke compared to the entire Michigan adult population (69.7% vs. 34.6%, respectively). Close to 15% of Michigan adults who had a history of stroke and hypertension reported that they were not currently taking antihypertensive medications. This represents a missed opportunity for hypertension control within our health care systems.

Not surprisingly, adults with a history of stroke and comorbid conditions were more likely to have a history of hypertension. Unfortunately, due to the insufficient numbers of MiBRFS respondents within this group, medication adherence could not be assessed. Further information pertaining to this high risk group should be considered in order to determine opportunities to focus future efforts. Improved hypertension control will require an expanded effort and an increased focus on serial monitoring of blood pressure by health care systems, clinicians, and individuals.

#### References

- <sup>1</sup> 2012 Michigan Death Certificate Registry. Division of Vital Records and Health Statistics, Michigan Department of Community Health; Population Estimate (latest update 9/2012), National Center for Health Statistics. U.S. Census Populations With Bridged Race Categories. Accessed July 16, 2014.
- <sup>2</sup> Centers for Disease Control and Prevention. Vital Signs: Awareness and Treatment of Uncontrolled Hypertension Among Adults - United States, 2003-2010. *MMWR*. September 4, 2012; 61(35): 703-709.
- <sup>3</sup> Centers for Disease Control and Prevention. Heart Disease and Stroke Prevention. Addressing The Nation's Leading Killers. 2011.
- <sup>4</sup> Kesarwani M, Perez A, Lopex VA, Wong ND, Franklin SS. Cardiovascular comorbidities and blood pressure control in stroke survivors. *J Hypertens*. 2009 May; 27(5): 1056-63.

**Table 2. Hypertension among Michigan Adults with Stroke and other Comorbid Conditions, 2013 Michigan BRFSS**

	Ever Told Hypertension	
	%	95% CI
<b>Stroke</b>	69.7	(63.7-75.0)
<b>Stroke and Diabetes</b>	88.4	(78.9-94.0)
<b>Stroke and Heart Attack</b>	78.7	(68.6-86.2)
<b>Stroke and Coronary Heart Disease</b>	85.7	(74.7-92.4)
<b>Stroke and Diabetes or Heart Attack or Coronary Heart Disease</b>	83.5	(76.6-88.6)
<b>Stroke and No Leisure Time Physical Activity</b>	68.8	(58.6-77.5)
<b>Stroke and Obesity</b>	80.0	(69.4-87.6)
<b>Stroke and Current Smoking</b>	58.8	(45.2-71.2)

## 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<sup>®</sup> to account for the complex sampling design.

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