TEXAS
Health and Human Services

Texas Department of State Health Services

A Supplemental Report of Texas Stroke System of Care, 2018 - Hospital Arrival Method and Comorbidities by Sex, Age, and Race

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Suggested citation:
A Supplemental Report of Texas Stroke System of Care, 2018 - Hospital Arrival Method and Comorbidities, by Sex, Age, and Race. Prepared by Chronic Disease Epidemiology, Health Promotion and Chronic Disease Prevention Section, Texas Department of State Health Services

Contents

BACKGROUND AND PURPOSE 4
ARRIVAL MODE 5
Table 1. Comparison of Hospital Arrival Mode (EMS vs. Private Vehicle) Among Eligible Stroke Cases, by Sex, Age Group, and Race/Ethnicity, 2017 5
OVERWEIGHT/OBESE 6
Table 2. Prevalence of Overweight/Obese Among Eligible Stroke Cases, By Year, 2008-2017 6
Figure 1. Trend in Prevalence of Overweight/Obese Among Eligible Stroke Cases, By Sex, 2008-2017 6
Figure 2. Trend in Prevalence of Overweight/Obese Among Eligible Stroke Cases, By Age Group, 2008-2017 7
Figure 3. Trend in Prevalence of Overweight/Obese Among Eligible Stroke Cases, By Race, 2008-2017 8
DIABETES HISTORY 9
Table 3. Prevalence of Diagnosed Diabetes Among Eligible Stroke Cases, By Year, 2008-2017 9
Figure 4. Trend in Prevalence of Diagnosed Diabetes Among Eligible Stroke Cases, By Sex, 2008-2017 9
Figure 5. Trend in Prevalence of Diagnosed Diabetes Among Eligible Stroke Cases, By Age Group, 2008-2017 10
Figure 6. Trend in Prevalence of Diagnosed Diabetes Among Eligible Stroke Cases, By Race, 2008-2017 10
HYPERTENSION HISTORY 12
Table 4. Prevalence of Hypertension Among Eligible Stroke Cases, By Year, 2008-2017 12
Figure 7. Trend in Prevalence of Hypertension Among Eligible Stroke Cases, By Sex, 2008-2017 12
Figure 8. Trend in Prevalence of Hypertension Among Eligible Stroke Cases, By Age Group, 2008-2017 13
Figure 9. Trend in Prevalence of Hypertension Among Eligible Stroke Cases, By Race, 2008-2017 14
CURRENT SMOKING 15

Table 5. Prevalence of Current Smoking Among Eligible Stroke Cases, By Year, 2008-2017 15
Figure 10. Trend in Prevalence of Current Smoking Among Eligible Stroke Cases, By Sex, 2008-2017 15
Figure 11. Trend in Prevalence of Current Smoking Among Eligible Stroke Cases, By Age Group, 2008-2017 16
Figure 12. Trend in Prevalence of Current Smoking Among Eligible Stroke Cases, By Race, 2008-2017 17
DYSLIPIDEMIA HISTORY 18
Table 6. Prevalence of Dyslipidemia Among Eligible Stroke Cases, By Year, 2008-2017 18
Figure 13. Trend in Prevalence of Dyslipidemia Among Eligible Stroke Cases, By Sex, 2008-2017 18
Figure 14. Trend in Prevalence of Dyslipidemia Among Eligible Stroke Cases, By Age Group, 2008-2017 19
Figure 15. Trend in Prevalence of Dyslipidemia Among Eligible Stroke Cases, By Race, 2008-2017 20

BACKGROUND AND PURPOSE

This is a supplemental report to *Texas Stroke System of Care Report*, *2018.*

During the 83rd Regular Texas Legislative Session, funds were appropriated to advance heart attack and stroke reduction efforts throughout Texas. To inform such efforts, the Texas Department of State Health Services (DSHS) launched a Heart Attack and Stroke Data Collection initiative. The data collection initiative focuses on pre-hospital and hospital data elements. This report includes de-identified, aggregate data for hospitals who have agreed to share "Get With The Guidelines®" (GWTG) Stroke data with DSHS. All data is protected under Health Insurance Portability Accountability Act (HIPAA) guidelines. No hospital level data will be distributed, nor will any hospital name be identified in the report.

The objectives of the data collection are to gain an understanding of the stroke systems of care in Texas, to evaluate pre-hospital and hospital care components, and to assess treatment of stroke patients. This supplemental report was requested by DSHS' Heart Disease and Stroke Program in order to 1) make comparisons in hospital arrival methods for stroke, and 2) identify the prevalence of comorbid conditions among stroke patients, stratified by sex, age, and race/ethnicity.

All data are intended to inform stakeholders about opportunities for collaboration and system enhancement. The findings in this report will be used to further assess the practices regarding delivery of care across the state and identify areas of opportunity for quality improvement.

ARRIVAL MODE

Table 1. Comparison of Hospital Arrival Mode (EMS vs. Private Vehicle) Among Eligible Stroke Cases, by Sex, Age Group, and Race/Ethnicity, 2017

	Age Group	Race	EMS		Private Vehicle	
			n=3,464	53.6%	n=3,002	46.4%
FEMALE	18-49	Black	102	45.1	124	54.9
		Hispanic	81	41.3	115	58.7
		White	84	35.0	156	65.0
		Other	21	55.3	17	44.7
	50-64	Black	241	51.4	228	48.6
		Hispanic	155	38.7	246	61.4
		White	334	46.5	385	53.6
		Other	31	36.9	53	63.1
	65+	Black	398	60.5	260	39.5
		Hispanic	387	53.7	334	46.3
		White	1,523	60.1	1,013	39.9
		Other	107	60.1	71	39.9
			n=3,363	51.7%	n=3,137	48.3%
MALE	18-49	Black	99	50.3	98	49.8
		Hispanic	122	47.5	136	52.5
		White	118	44.2	149	55.8
		Other	14	42.4	19	57.6
	50-64	Black	300	53.3	263	46.7
		Hispanic	250	40.5	368	59.6
		White	466	48.9	488	51.2
		Other	51	46.8	58	53.2
	65+	Black	281	61.5	176	38.5
		Hispanic	418	52.9	372	47.1
		White	1,153	55.1	940	44.9
		Other	91	56.2	71	43.8
	Overall Total		n=6,827	52.7%	n=6,139	47.4%

For 2017, slightly more stroke cases arrived to the hospital via EMS than personal vehicle, both overall (53 in 100 cases vs 47 in 100 cases, respectively) as well as for males or females. In general, cases ages 65 years and older were more likely to arrive via EMS than those in the younger age groups.

EMS transport was lowest among White females ages 18-49 years (35 in 100 cases), followed by "Other" females ages 50-64 years (37 in 100). EMS transport was highest among Black males ages 65 and older (62 in 100), followed closely by Black, White, and "Other" females ages 65 and older (60-61 in 100).

OVERWEIGHT/OBESE

Table 2. Prevalence of Overweight/Obese Among Eligible Stroke Cases, By Year, 2008-2017

Year	Eligible Cases	Overweight/Obese		Reporting Hospitals
	N=69,684	n=49,664	71.3%	N
2008	4,044	2,778	68.3	19
2009	4,968	3,524	70.7	27
2010	5,879	4,153	70.6	29
2011	5,026	3,595	71.3	23
2012	5,127	3,663	71.4	27
2013	6,246	4,546	72.5	31
2014	7,044	5,050	71.4	39
2015	9,719	6,927	71.1	38
2016	10,696	7,644	71.3	40
2017	10,935	7,908	72.2	37

The prevalence of overweight/obese at the time of stroke increased by 6% between 2008 and 2017 (from 68 per 100 to 72 per 100 cases).

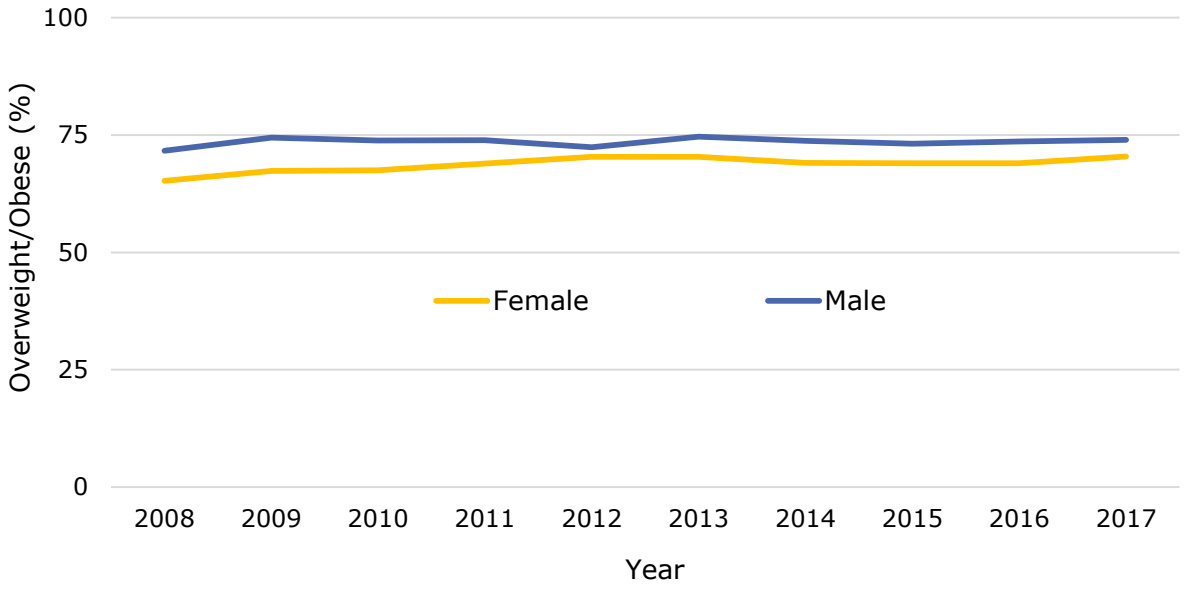

Figure 1. Trend in Prevalence of Overweight/Obese Among Eligible Stroke Cases, By Sex, 2008-2017

The prevalence of overweight/obese is slightly higher for males than females, and has increased since 2008 for both sexes. For males, the rate increased by 3% (72 per 100 to 74 per 100 males) while the rate for females increased by 8% (65 per 100 to 70 per 100 females).

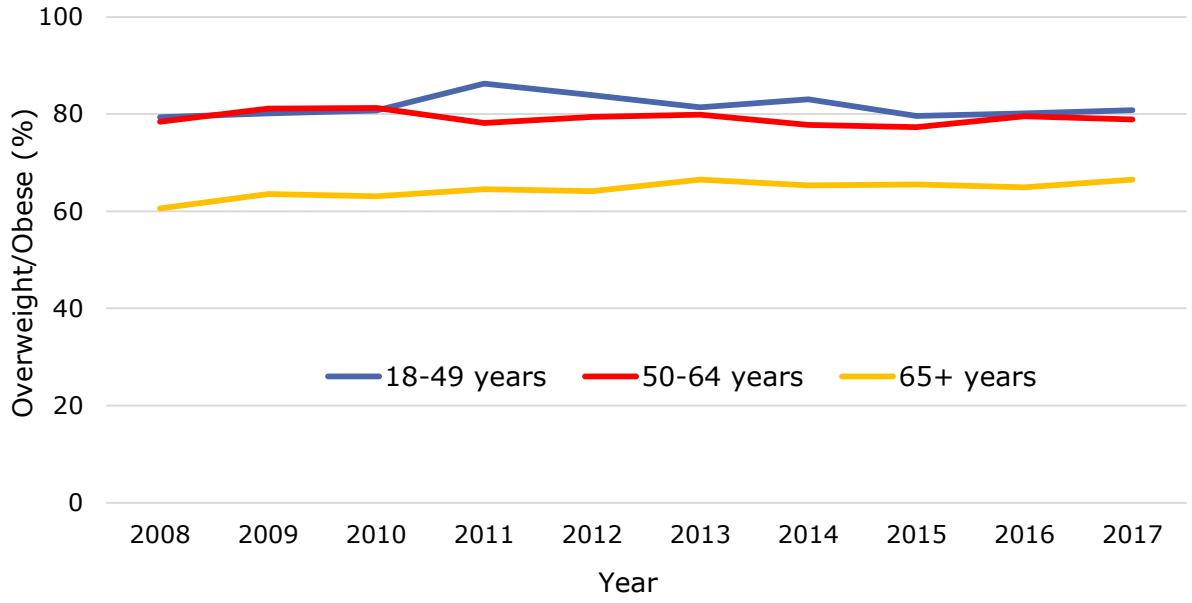

Figure 2. Trend in Prevalence of Overweight/Obese Among Eligible Stroke Cases, By Age Group, 2008-2017

The prevalence of overweight/obese is lower for those ages 65 years and older than for younger age groups; the prevalence is similar for those ages 18-49 years and those ages 50-64 years. Among stroke cases ages 65 and older, the prevalence of overweight/obese increased by 8% between 2008 and 2017 (from 61 per 100 to 66 per 100). Over the same time, the rate for those ages 18-49 and 50-64 increased by 3% (from 78 per 100 to 80 per 100).

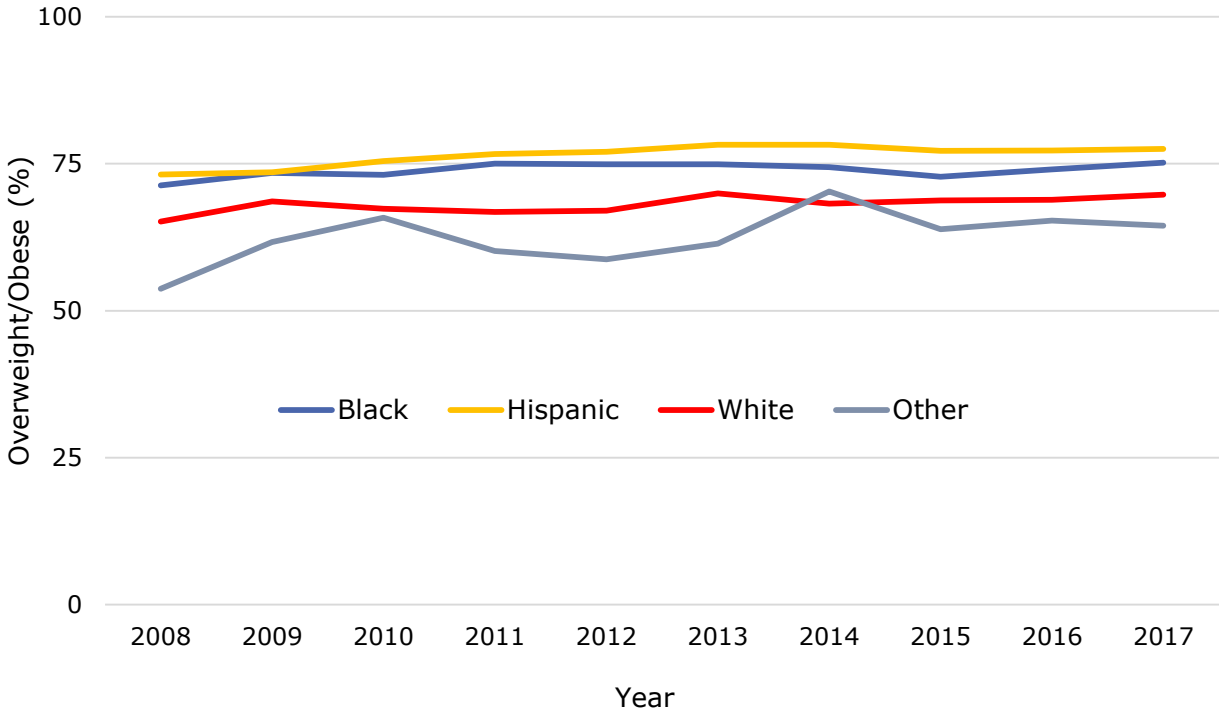

Figure 3. Trend in Prevalence of Overweight/Obese Among Eligible Stroke Cases, By Race, 2008-2017

The prevalence of overweight/obese differs by race group, being highest among Hispanics, followed by Blacks, Whites, then "Other". Between 2008 and 2017, the rate has increased slightly for all race groups: among Hispanic stroke cases, the prevalence of overweight/obese increased from 73 per 100 to 78 per 100, a 7% increase; among Black stroke cases, from 71 per 100 to 75 per 100, a 6% increase; among White stroke cases, from 65 per 100 to 70 per 100, an 8% increase; and for "Other", from 54 per 100 to 64 to 100, a 19% increase.

DIABETES HISTORY

Table 3. Prevalence of Diagnosed Diabetes Among Eligible Stroke Cases, By Year, 2008-2017

Year	Eligible Cases	Diabetes		Reporting Hospitals
	N=101,287	n=38,681	38.2%	N
2008	4,765	1,654	34.7	21
2009	5,718	2,168	37.9	27
2010	7,455	2,781	37.3	33
2011	8,440	3,226	38.2	35
2012	8,898	3,292	37.0	40
2013	10,279	3,896	37.9	44
2014	11,739	4,491	38.3	49
2015	14,158	5,498	38.8	49
2016	14,838	5,755	38.8	50
2017	14,997	5,920	39.5	49

Over the past 10 years, the prevalence of diagnosed diabetes (i.e., diagnosed with diabetes prior to the stroke episode) among stroke cases has increased 14%, from 35 per 100 in 2008 to 40 per 100 in 2017.

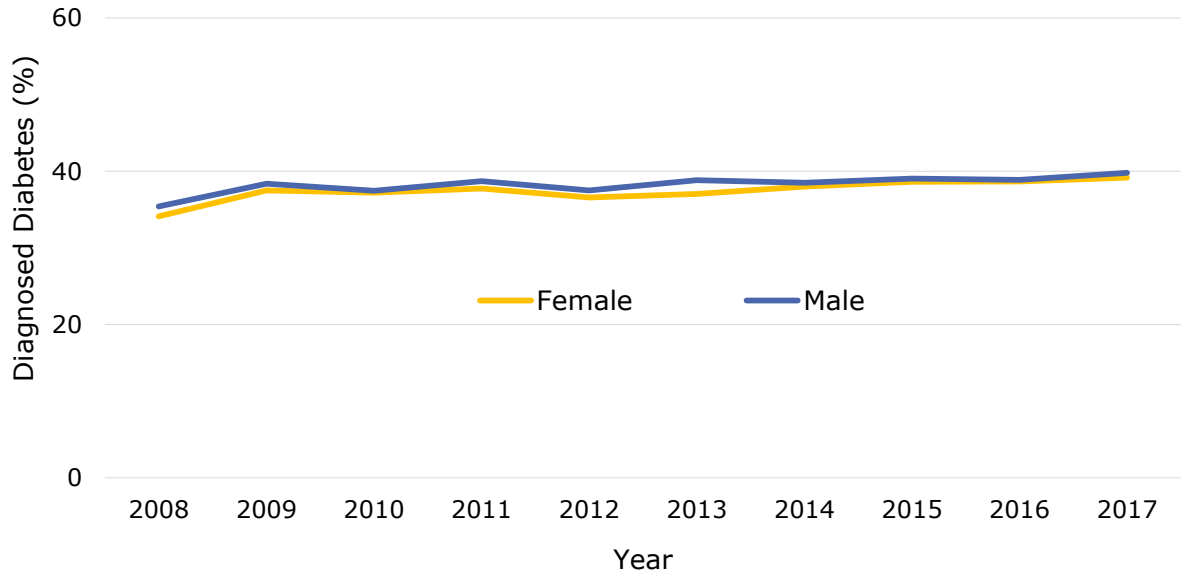

Figure 4. Trend in Prevalence of Diagnosed Diabetes Among Eligible Stroke Cases, By Sex, 2008-2017

The prevalence of diagnosed diabetes is similar for males and females. It has increased from 34-35 per 100 in 2008 to 40 per 100 in 2017 (a 16% increase).

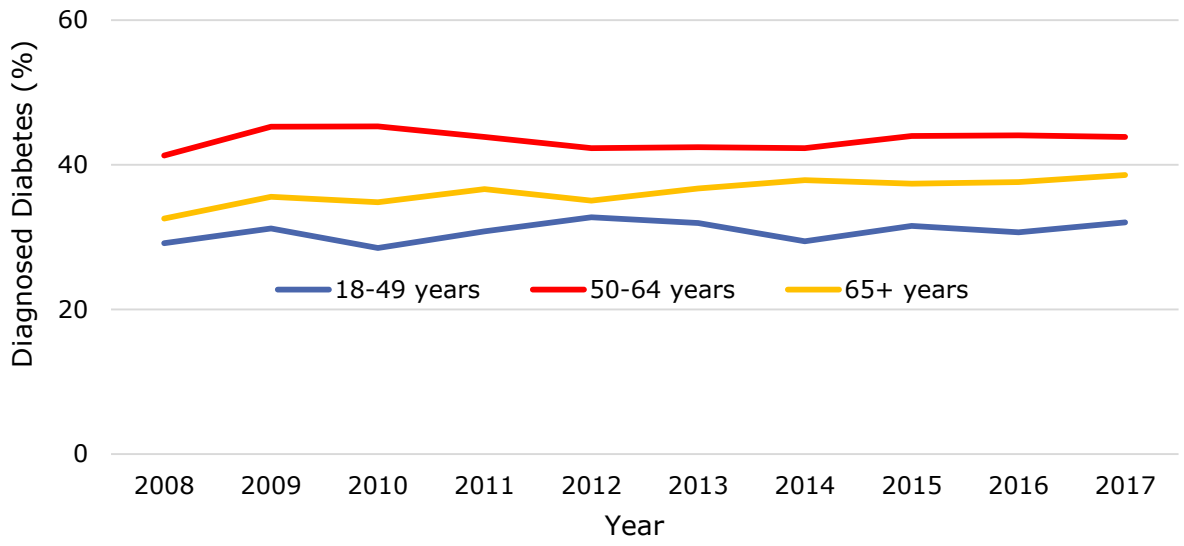

Figure 5. Trend in Prevalence of Diagnosed Diabetes Among Eligible Stroke Cases, By Age Group, 2008-2017

Diagnosed diabetes is most common among those ages 50-64 years, followed by those ages 65 years and older, and is least common among those ages 18-49 years. From 2008 to 2017, the prevalence of diabetes has increased slightly for all age groups: a 10% increase, from 29 in 100 to 32 in 100, among those ages 18-49 years; a 7% increase, from 41 in 100 to 44 in 100, among those ages 50-64 years; and an 18% increase, from 33 in 100 to 39 in 100, among those ages 65 years and older.

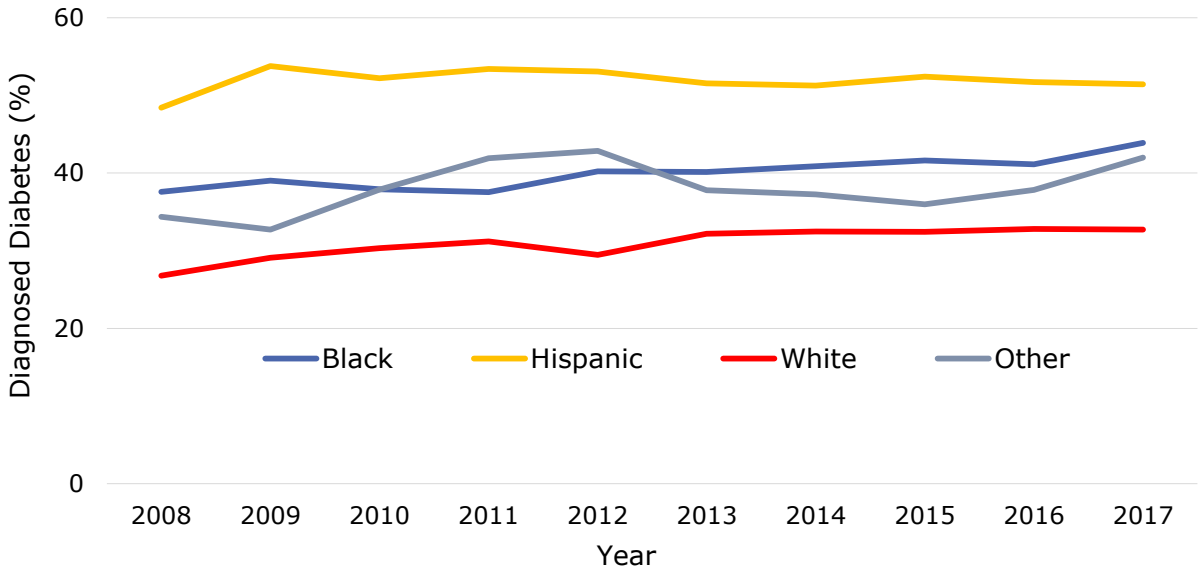

Figure 6. Trend in Prevalence of Diagnosed Diabetes Among Eligible Stroke Cases, By Race, 2008-2017

Diagnosed diabetes differed by race group, being most common among Hispanic stroke cases, and least common among White stroke cases; the prevalence of diagnosed diabetes is similar for Black and "Other" cases. From 2008 – 2017, the prevalence of diagnosed diabetes has increased across all race groups, with the greatest increases seen among "Other" (from 34 in 100 to 42 in 100, a 24% increase) and White (from 27 in 100 to 33 in 100, a 22% increase). Among Black cases, the prevalence increased from 38 in 100 to 44 in 100, a 16% increase and among Hispanics from 48 in 100 to 51 in 100 a 6% increase.

HYPERTENSION HISTORY

Table 4. Prevalence of Hypertension Among Eligible Stroke Cases, By Year, 2008-2017

Year	Eligible Cases	Hypertension		Reporting Hospitals
	N=101,287	n=82,004	81.0%	N
2008	4,765	3,666	76.9	21
2009	5,718	4,722	82.6	27
2010	7,455	6,138	82.3	33
2011	8,440	6,978	82.7	35
2012	8,898	7,251	81.5	40
2013	10,279	8,273	80.5	44
2014	11,739	9,478	80.7	49
2015	14,158	11,556	81.6	49
2016	14,838	11,889	80.1	50
2017	14,997	12,053	80.4	49

The prevalence of hypertension as a pre-existing condition among stroke cases has remained relatively stable since 2008, with a 10-year average prevalence of 81 per 100 cases.

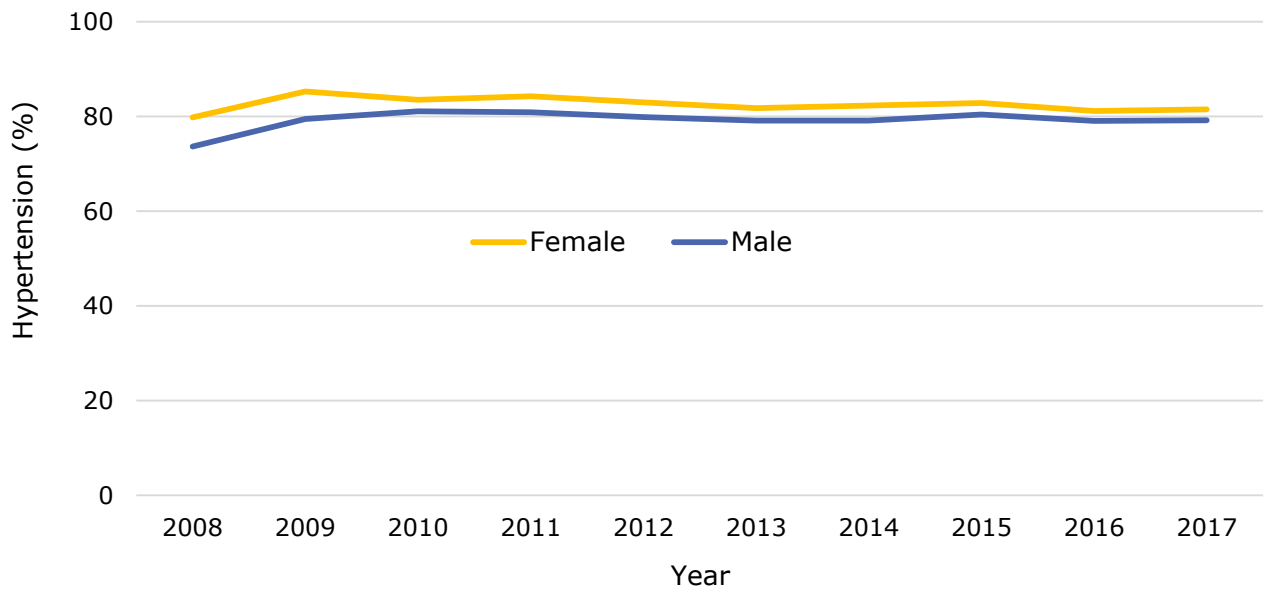

Figure 7. Trend in Prevalence of Hypertension Among Eligible Stroke Cases, By Sex, 2008-2017

In 2008, hypertension was slightly more common among female than male stroke cases (80 per 100 females vs. 74 per 100 males). Over time, this difference has

decreased, with 82 out of every 100 female stroke cases and 79 out of every 100 male stroke cases in 2017 reporting a history of hypertension.

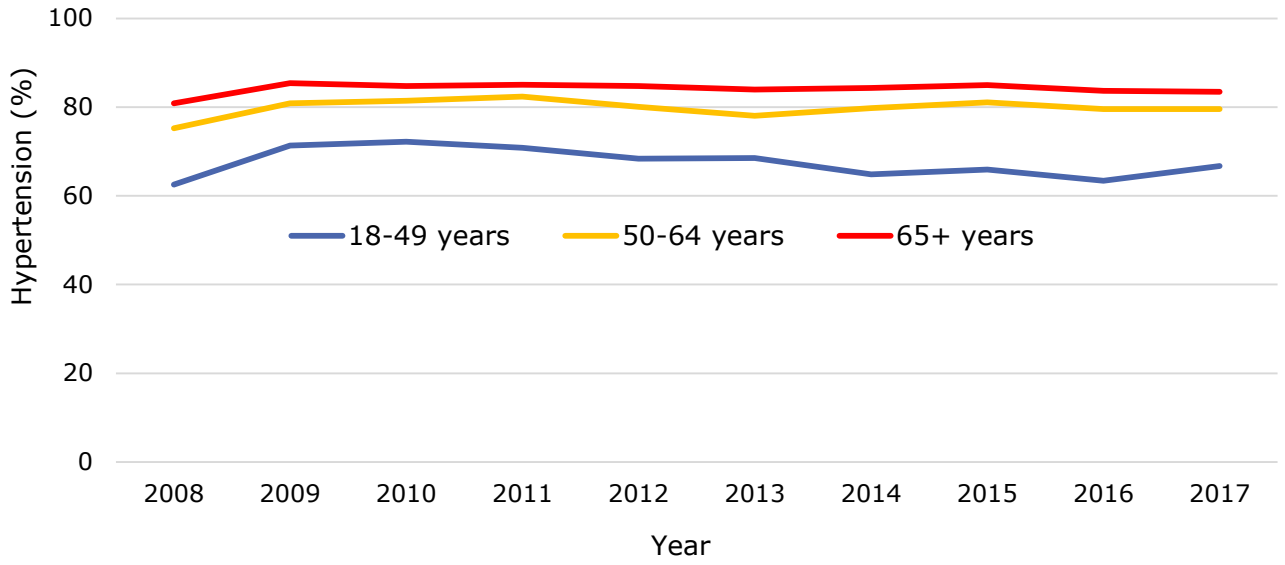

Figure 8. Trend in Prevalence of Hypertension Among Eligible Stroke Cases, By Age Group, 2008-2017

Hypertension is most common among stroke cases ages 65 years and older, followed by those ages 50-64 years, and is least common among those ages 18-49 years. Since 2008, the prevalence of hypertension has increased slightly for all age groups: from 81 per 100 to 83 per 100 cases ages 65 and older (a 2% increase); from 75 per 100 to 80 per 100 cases ages 50-64 years (a 7% increase); and from 63 per 100 to 67 per 100 cases ages 18-49 (a 6% increase).

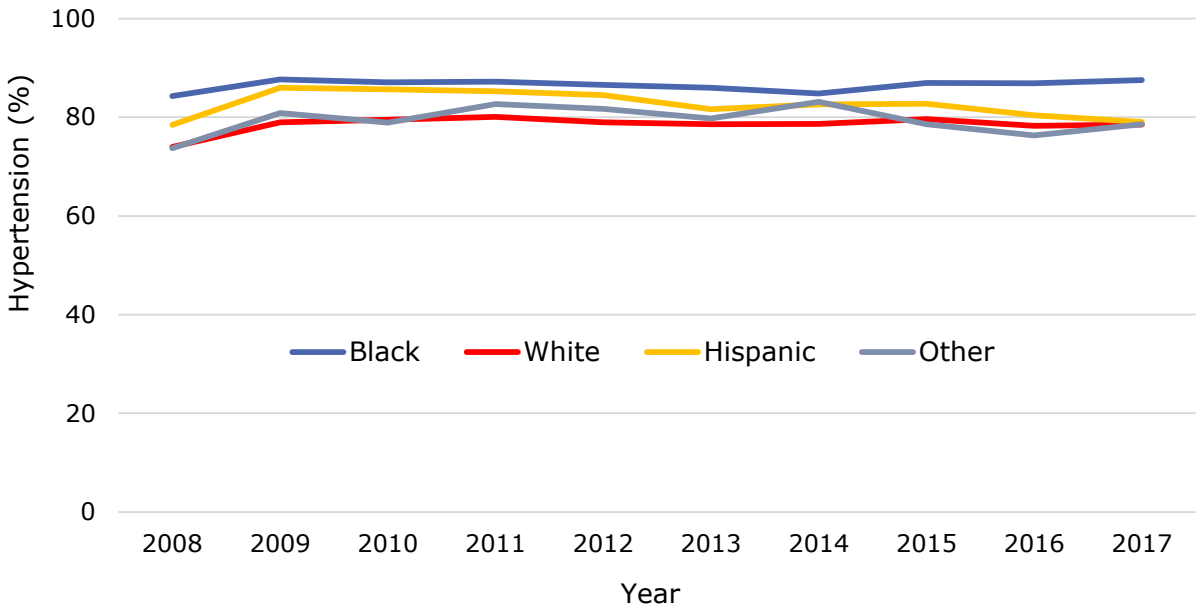

Figure 9. Trend in Prevalence of Hypertension Among Eligible Stroke Cases, By Race, 2008-2017

Hypertension is common among all race groups but is highest among Black stroke cases. In 2008, hypertension was more common among Hispanic than among White and "Other" stroke cases, but this difference has disappeared over time. From 2008-2017, the prevalence of hypertension has increased 5% among Black stroke cases (84 in 100 to 88 in 100) and 7% among White and "Other" stroke cases (74 in 100 to 79 in 100). The rate among Hispanic cases was 78 per 100 cases in 2008 and 79 per 100 cases in 2017, with minor fluctuations over each reporting year.

CURRENT SMOKING

Table 5. Prevalence of Current Smoking Among Eligible Stroke Cases, By Year, 2008-2017

Year	Eligible Cases	Current Smoker		Reporting Hospitals
	N=101,287	n=19,260	19.0%	N
2008	4,765	945	19.8	21
2009	5,718	1,077	18.8	27
2010	7,455	1,458	19.6	33
2011	8,440	1,657	19.6	35
2012	8,898	1,802	20.3	40
2013	10,279	2,074	20.2	44
2014	11,739	2,260	19.3	49
2015	14,158	2,674	18.9	49
2016	14,838	2,733	18.4	50
2017	14,997	2,580	17.2	49

From 2008 through 2013, roughly 20 in 100 stroke cases reported being a current smoker. Since 2014, this has slowly declined, to 17 in 100 stroke cases in 2017 (a 15% decrease).

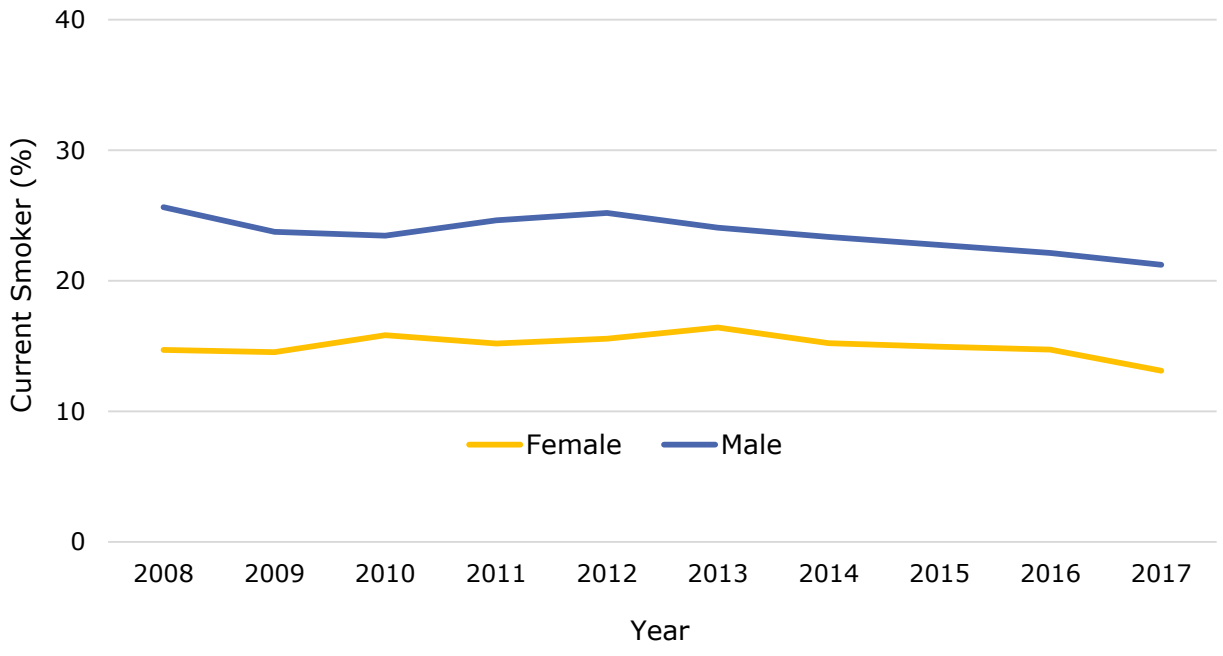

Figure 10. Trend in Prevalence of Current Smoking Among Eligible Stroke Cases, By Sex, 2008-2017

Smoking is more common among male than female stroke cases, although the prevalence has decreased slightly over time for either sex. Among males, the rate has declined 19%, from 26 in 100 to 21 in 100 male stroke cases. Among females, the rate has declined 13%, from 15 in 100 to 13 in 100 female stroke cases.

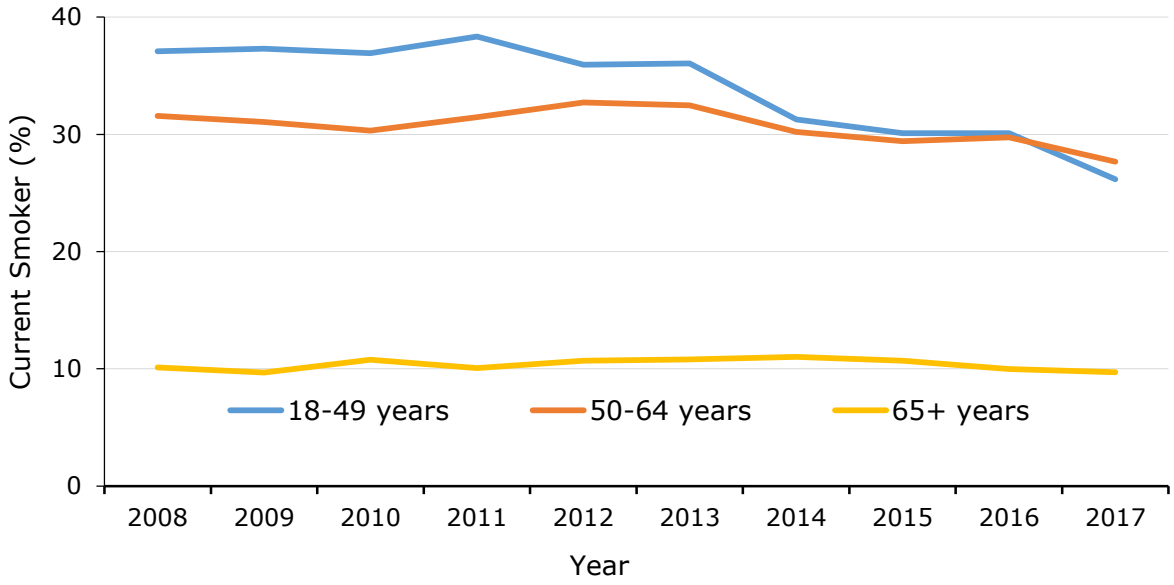

Figure 11. Trend in Prevalence of Current Smoking Among Eligible Stroke Cases, By Age Group, 2008-2017

Stroke cases ages 65 years and older have a much lower prevalence of current smoking than the younger age groups, with 10 per 100 reporting being current smokers, from 2008 to 2017. Stroke cases 18-49 years of age had a higher prevalence of smoking than did those ages 50-64, but this difference has disappeared over time. The rate for those ages 18-49 has decreased 30%, from 37 per 100 to 26 per 100, and has decreased 13% for those ages 50-64, from 32 per 100 to 28 per 100.

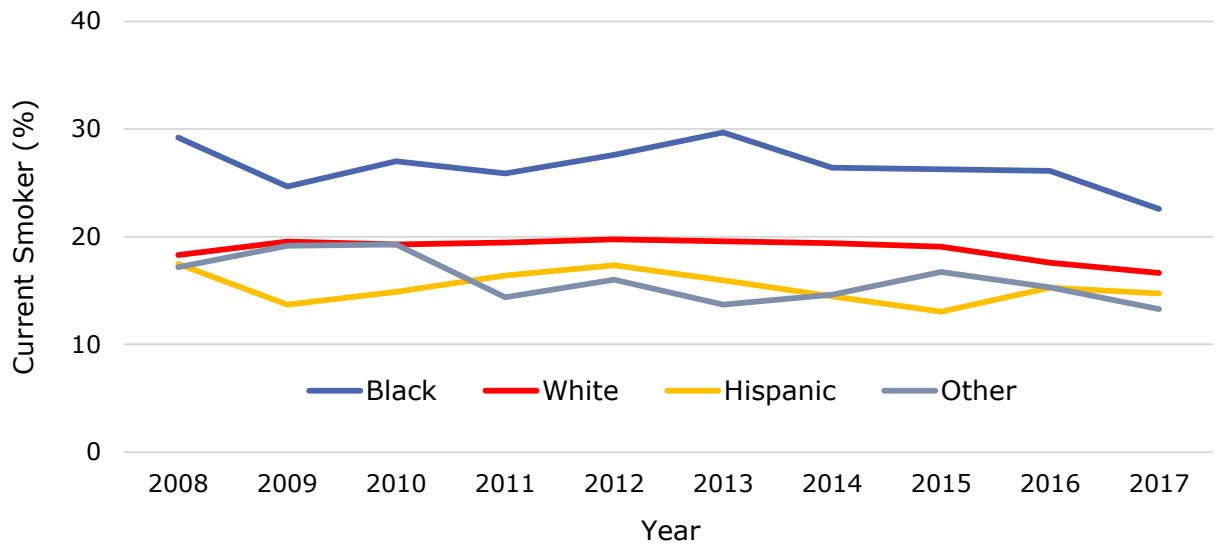

Figure 12. Trend in Prevalence of Current Smoking Among Eligible Stroke Cases, By Race, 2008-2017

Current smoking is more common among Black stroke cases than among White, Hispanic, or "Other". The prevalence of smoking has declined for all race groups between 2008 and 2017. Among Black cases, the rate has decreased 21% (29 per 100 to 23 per 100); among Hispanic cases, the rate has decreased 17% (18 per 100 to 15 per 100); among White cases, the rate has decreased 6% (18 per 100 to 17 per 100); among "Other" cases, the rate has decreased 24% (17 per 100 to 13 per 100).

DYSLIPIDEMIA HISTORY

Dyslipidemia is defined as having total cholesterol >200 mg/dL, a low density lipoprotein (LDL) ≥130 mg/dL, or a high density lipoprotein (HDL) <40 mg/dL

Table 6. Prevalence of Dyslipidemia Among Eligible Stroke Cases, By Year, 2008-2017

Year	Eligible Cases	Dyslipidemia		Reporting Hospitals
	N=101,287	n=44,033	43.5%	N
2008	4,765	1,438	30.2	18
2009	5,718	2,107	36.9	26
2010	7,455	3,071	41.2	30
2011	8,440	3,856	45.7	26
2012	8,898	4,135	46.5	31
2013	10,279	4,542	44.2	40
2014	11,739	5,339	45.5	44
2015	14,158	6,312	44.6	45
2016	14,838	6,571	44.3	46
2017	14,997	6,662	44.4	44

The prevalence of dyslipidemia as a pre-existing condition among stroke cases increased by 47%, from 30 per 100 cases in 2008 44 per 100 cases in 2017.

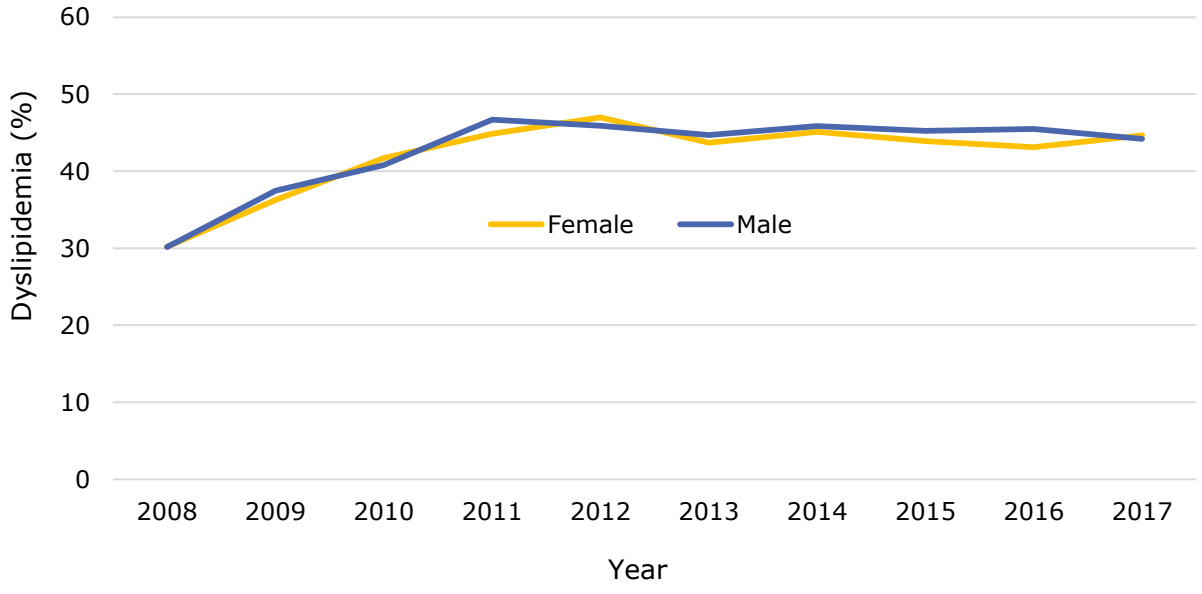

Figure 13. Trend in Prevalence of Dyslipidemia Among Eligible Stroke Cases, By Sex, 2008-2017

History of dyslipidemia does not differ between female and male stroke cases. Over time, the prevalence has increased for both sexes, from 30 in 100 cases to 44 per 100 cases, a 47% increase.

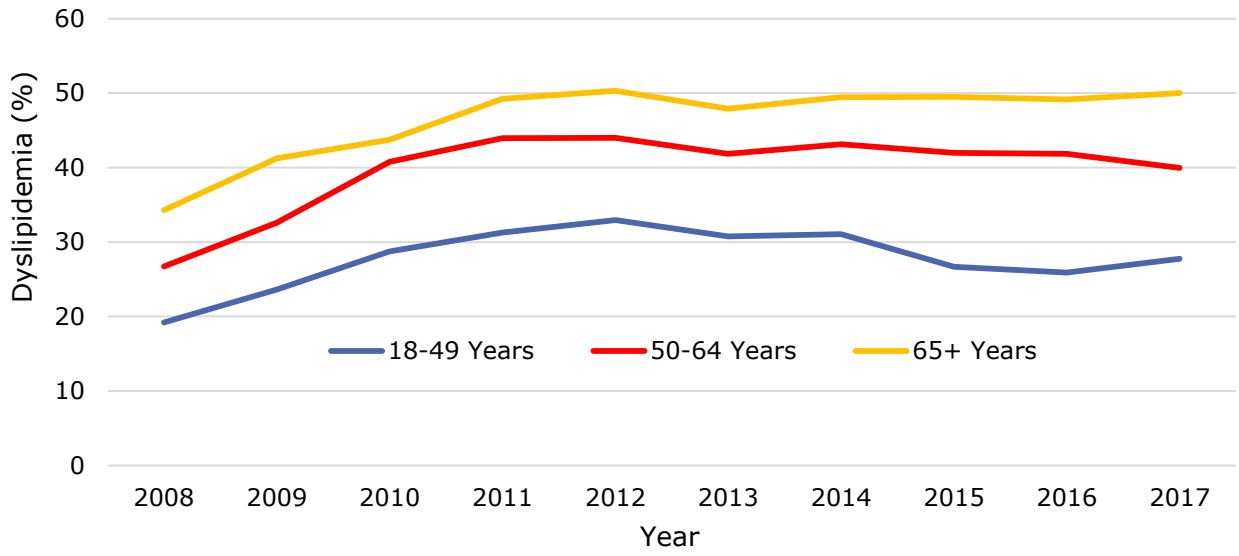

Figure 14. Trend in Prevalence of Dyslipidemia Among Eligible Stroke Cases, By Age Group, 2008-2017

A history of dyslipidemia is most common among stroke cases ages 65 years and older, followed by those ages 50-64 years, and is least common among those ages 18-49 years, and has increased for all age groups over time. Among those age 18-49 years, the rate has increased by 47%, from 19 per 100 to 28 per 100; among those 50-64 years of age, the rate has increased by 48% (27 per 100 to 40 per 100); among those 65 and older, the rate has increased by 47% (34 per 100 to 50 per 100).

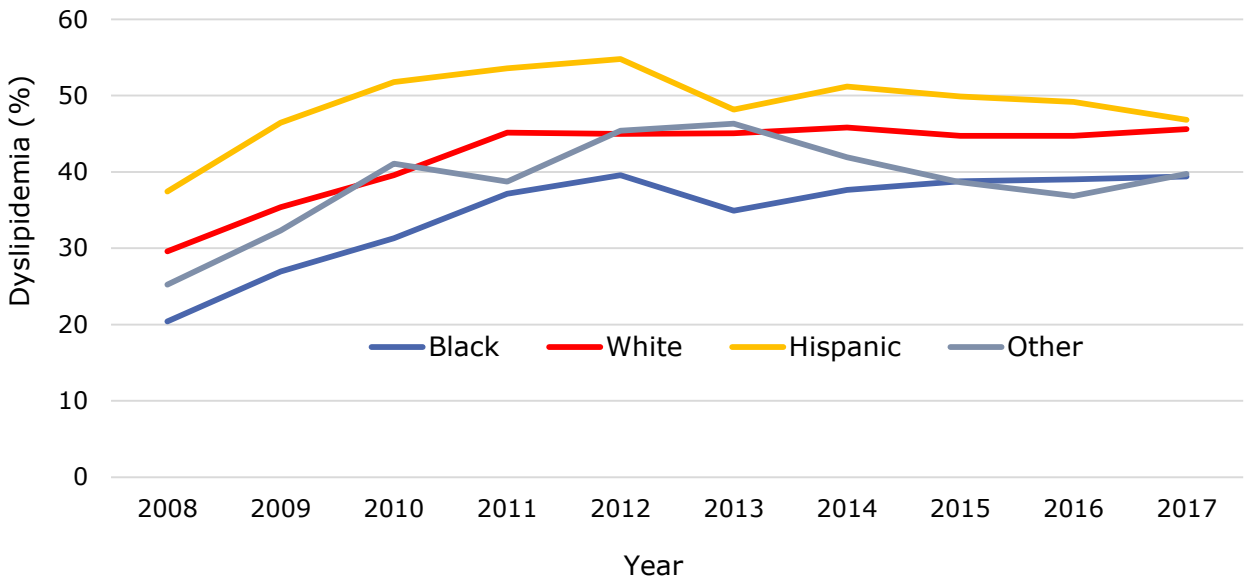

Figure 15. Trend in Prevalence of Dyslipidemia Among Eligible Stroke Cases, By Race, 2008-2017

From 2008 to 2017, the prevalence of history of dyslipidemia has increased for all races, with some fluctuations year to year. For "Other" cases, the rate rose from 25 per 100 to 40 per 100 (a 60% increase); for Black cases, the rate rose from 20 per 100 to 39 per 100 (a 95% increase); for Hispanic cases, the rate rose from 37 per 100 to 47 per 100 (a 27% increase); for White cases, the rate rose from 30 per 100 to 46 per 100 (a 53% increase).