



Introduction

Myocardial infarction (i.e., heart attack) and stroke remain two of the leading causes of death in New York and the United States. In 2005 in New York State, heart attack was responsible for 9,900 deaths and stroke for 6,600 deaths.¹ In combination, these conditions were identified as the underlying cause for approximately one of every nine deaths in New York in 2005. In the United States in 2004, approximately 856,000 persons experienced a new or recurrent heart attack and approximately 700,000 had a new or recurrent stroke.² Approximately 157,000 of these heart attacks and 150,000 of these strokes were fatal.²

A significant proportion of heart attack and stroke victims die before accessing medical care. Approximately 54% of the stroke deaths in the United States in 2004 occurred outside hospitals and nearly half of cardiac deaths are estimated to occur within 1 hour of symptom onset, before patients reach hospitals.² For other victims of heart attack or stroke, medical care was accessed too late for procedures that must be administered within a short period of time after the onset of an event in order to be beneficial.^{3 4}

Failure to recognize the signs and symptoms of stroke and the need to call 9-1-1 are important causes of delays in seeking care and increase heart attack and stroke mortality.⁵ Surveys indicate that awareness of the signs and symptoms of heart attack and stroke is low.^{6 7} A key public health strategy to lower heart attack and stroke mortality is to increase awareness of the signs and symptoms of heart attack and stroke. Healthy People 2010 objectives include increasing the proportion of adults who are aware of the early warning symptoms and signs of a heart attack and stroke and the importance of accessing rapid emergency care by calling 9-1-1 (objective 12-2 and objective 12-8).⁸

This report summarizes New York State data on awareness of the signs and symptoms of heart attack and stroke and of the need to respond to these symptoms by telephoning 9-1-1. The report presents new data from 2005 and describes changes since 2001.⁹ Data were collected as part of the New York State Behavioral Risk Factor Surveillance System (BRFSS).

AWARENESS OF HEART ATTACK AND STROKE SIGNS AND SYMPTOMS: New York State Adults, 2005

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Methods

The BRFSS is an annual statewide random-digit-dialed telephone survey of adults developed by the Centers for Disease Control and Prevention (CDC) and administered by the New York State Department of Health. The BRFSS is designed to provide information on behaviors, risk factors, and utilization of preventive services related to the leading causes of chronic and infectious diseases, disability, injury and death among the non-institutionalized, civilian population aged 18 years and older.

The following questions were asked to measure the public's knowledge of the signs and symptoms of a heart attack or stroke. The questions in italics were included as decoys, to gauge true knowledge of symptoms, as opposed to answering all questions in a similar pattern.

Heart Attack awareness questions:

Which of the following do you think is a symptom of a heart attack? For each, tell me "Yes", "No", or you're "Not sure".

1. Do you think pain or discomfort in the neck, jaw, or back are symptoms of a heart attack?
2. Do you think feeling weak, lightheaded, or faint are symptoms of a heart attack?
3. Do you think chest pain or discomfort are symptoms of a heart attack?
4. *Do you think sudden trouble seeing in one or both eyes is a symptom of a heart attack?*
5. Do you think pain or discomfort in the arms or shoulder are symptoms of a heart attack?
6. Do you think shortness of breath is a symptom of a heart attack?

Stroke awareness questions:

Which of the following do you think is a symptom of stroke? For each, tell me "Yes", "No", or you're "Not sure".

1. Do you think sudden confusion or trouble speaking are symptoms of a stroke?
2. Do you think sudden numbness or weakness of face, arm, or leg, especially on one side, are symptoms of a stroke?
3. Do you think sudden trouble seeing in one or both eyes is a symptom of a stroke?
4. *Do you think sudden chest pain or discomfort are symptoms of a stroke?*
5. Do you think sudden trouble walking, dizziness, or loss of balance are symptoms of a stroke?
6. Do you think severe headache with no known cause is a symptom of a stroke?

Respondents were also asked the following question to measure the public's awareness to call 9-1-1 when they thought someone was having a heart attack or stroke:

If you thought someone was having a heart attack or a stroke, what is the first thing you would do?

Response choices:

1. take them to the hospital
2. tell them to call their doctor
3. call 9-1-1
4. call their spouse or a family member
5. do something else

Measures

CDC developed procedures for scoring the items; these were applied to the survey participants' responses.^{6,7} Respondents were identified as "aware" of each of the five valid heart attack and five valid stroke awareness questions if they answered "yes" to the question about that symptom. The responses "no" or "unsure" were coded incorrect. Respondents were identified as correctly recognizing the two decoy questions if they answered "no." The responses "yes" or "unsure" were coded incorrect.

Correctly identifying the five valid symptoms of heart attack and the five valid symptoms of stroke has been reported as an indicator of population awareness of the signs and symptoms of these conditions.^{6,7,8} Because a respondent could be mistakenly identified as being aware of the signs and symptoms of stroke by exhibiting a response bias (i.e., saying "yes" to all symptom questions), past surveillance reports have also included correctly identifying the decoy items for heart attack (sudden trouble seeing in one or both eyes) and stroke (sudden chest pain or discomfort) as a criterion for awareness. In this report, the decoy questions were not incorporated into the overall indicator of heart attack and stroke sign and symptom awareness. There are two reasons. First, only a small percentage of survey respondents answered "yes" to all 12 of the questions about symptoms (5%), suggesting the proportion of respondents exhibiting a response bias was relatively small (less than 5%). Second, the two decoy items did not predict awareness of the signs and symptoms of heart attack and stroke in a consistent manner. For heart attack, respondents who correctly indicated sudden trouble seeing in one or both eyes was not a symptom of heart attack were significantly less likely (44%) to correctly identify all five valid signs and symptoms. For stroke, respondents who correctly indicated chest pain was not a symptom of stroke were significantly more likely (41%) to correctly identify all five valid signs and symptoms of stroke.

Statistical Analyses

Weighted percentages and 95% confidence intervals (95% CI) were calculated using SUDAAN.¹⁰ Percentages based on fewer than 50 observations are noted in the tables, but because these estimates are less reliable, they should be interpreted with caution.

Results

Awareness of the individual warning signs and symptoms of heart attack ranged from 47.4% (pain or discomfort in the jaw, neck or back) to 91.6% (sudden chest pain or discomfort). [Table 1] Awareness of the warning symptoms of stroke ranged from 56.4% (severe headache with no known cause) to 90.6% (sudden numbness or weakness of face, arm or leg, especially on one side of the face). [Table 2] Eighty-seven percent of respondents correctly identified calling 9-1-1 as their first action if they thought someone else was having a heart attack or stroke.

Awareness of all five warning symptoms of stroke and all five warning signs of heart attack and stroke was low [Table 3]. Only 32.0% of respondents recognized all five signs and symptoms of heart attack and only 41.8% of respondents recognized the five stroke signs and symptoms. For both heart attack and stroke, awareness of the warning signs and symptoms varied by gender, race/ethnicity and educational attainment. Awareness was significantly higher among women (36.6% and 45.8% for heart attack and stroke, respectively), white respondents (36.9% and 46.6% for heart attack and stroke, respectively), and among those with some college education or college graduates (35.8% and 36.9% for heart attack and 46.7% and 50.1% for stroke, respectively) than among men (26.9% and 37.3% for heart attack and stroke, respectively), black and Hispanic respondents (23.1% and 16.2% for heart attack and 37.1% and 24.6% for stroke, respectively) and those with a high school education or less than a high school education (27.1% and 16.5% for heart attack and 33.5% and 18.5% for stroke, respectively).

Awareness of the signs and symptoms of heart attack was significantly higher among those with a history of coronary heart disease (CHD), angina or heart attack (44.0%) and those reporting they were diagnosed with high blood pressure (41.1%) than among those without a history of CHD, angina or heart attack (31.3%) or who had not been diagnosed with high blood pressure (29.1%), respectively. Awareness of the signs and symptoms of stroke did not differ depending on the high blood pressure status or stroke history of the respondents.

Recognition of the need to call 9-1-1 did not differ by the race/ethnicity, income, or educational attainment of the respondents. However, women were significantly more likely than men to report they would call 9-1-1 in the event of a heart attack or stroke (90.0% and 83.5%, respectively). [Tables 1 and 2]

Figure 1 and Figure 2 depict age-adjusted¹ estimates of the percentage of adults recognizing each of the warning signs and symptoms of heart attack and stroke in 2001 and 2005.

Awareness of the signs and symptoms of both conditions among adults in New York State did not change from 2001 to 2005.

¹ Estimates were age-adjusted to the 2000 US Census Population.

Discussion

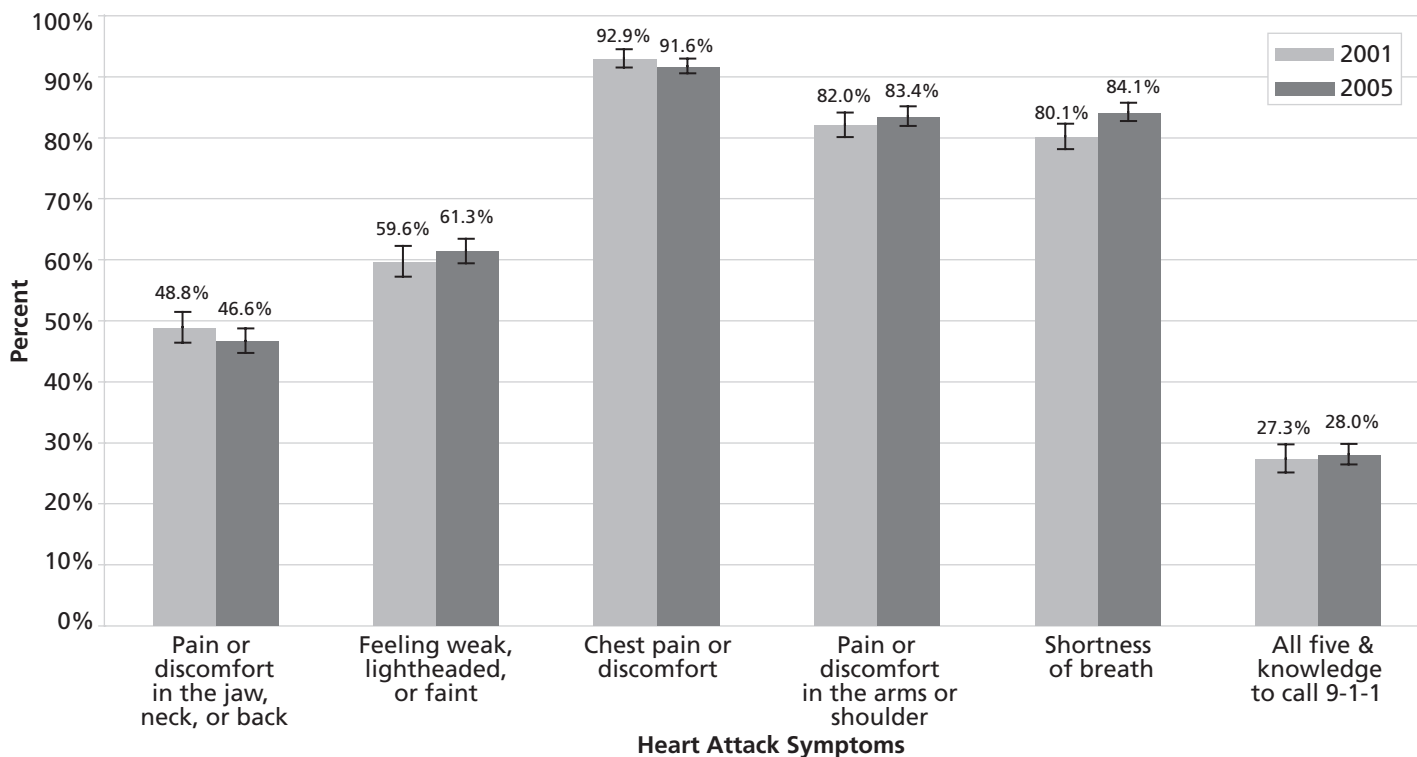
Encouraging timely access to medical care by promoting recognition of the warning signs and symptoms of heart attack and stroke and the importance of calling 9-1-1 has the potential to reduce mortality and morbidity attributable to these conditions. The data in this report suggest recognition for specific warning symptoms of heart attack (e.g., chest pain or discomfort; pain or discomfort in the arms or shoulder; shortness of breath) and stroke (e.g., sudden numbness or weakness of the face, arm or leg; sudden confusion or trouble speaking; sudden trouble walking, dizziness or loss of balance) and of the importance of using 9-1-1 when a person is having a heart attack or stroke is relatively high. More than 80% of the adults in New York are estimated to be able to recognize these symptoms as signs and symptoms of heart attack and stroke. However, because recognition of other warning symptoms (e.g., pain or discomfort in jaw, neck or back for heart attack and severe headache with no known cause for stroke) was significantly lower, awareness of all five of the warning signs and symptoms of heart attack and stroke remains low. One implication is that public health awareness campaigns should strive to both reinforce the public's correct impressions about warning signs and symptoms of heart attack and stroke and build upon them by describing other important signs and symptoms that should be considered cues to calling 9-1-1.

Awareness of the signs and symptoms of heart attack and stroke was higher among women, white respondents, and those with higher incomes and higher educational attainment. These disparities should inform the messages designed, channels selected and populations targeted by future awareness campaigns. Awareness campaigns should also be culturally sensitive, appropriate for individuals with limited educational backgrounds and transmitted through familiar and respected channels. The particularly low level of recognition observed among Hispanic adults suggests the need for a campaign targeting this growing segment of the population.

Awareness of the warning symptoms of heart attack was greater among adults reporting elevated blood pressure and those reporting histories of coronary heart disease or heart attack. However, less than half of the adults with elevated blood pressure or histories of CHD or heart attack were able to recognize all five warning symptoms. These findings are consistent with a large-scale study of ischemic heart disease patients which demonstrated low levels of heart attack symptom awareness among a population at elevated risk for a coronary event or stroke.¹¹ Recognition of the symptoms of stroke did not vary depending on adults' clinical histories of stroke or high blood pressure. Interventions within medical settings using health educators and medical personnel would be one potential means of addressing the low levels of awareness among these populations.

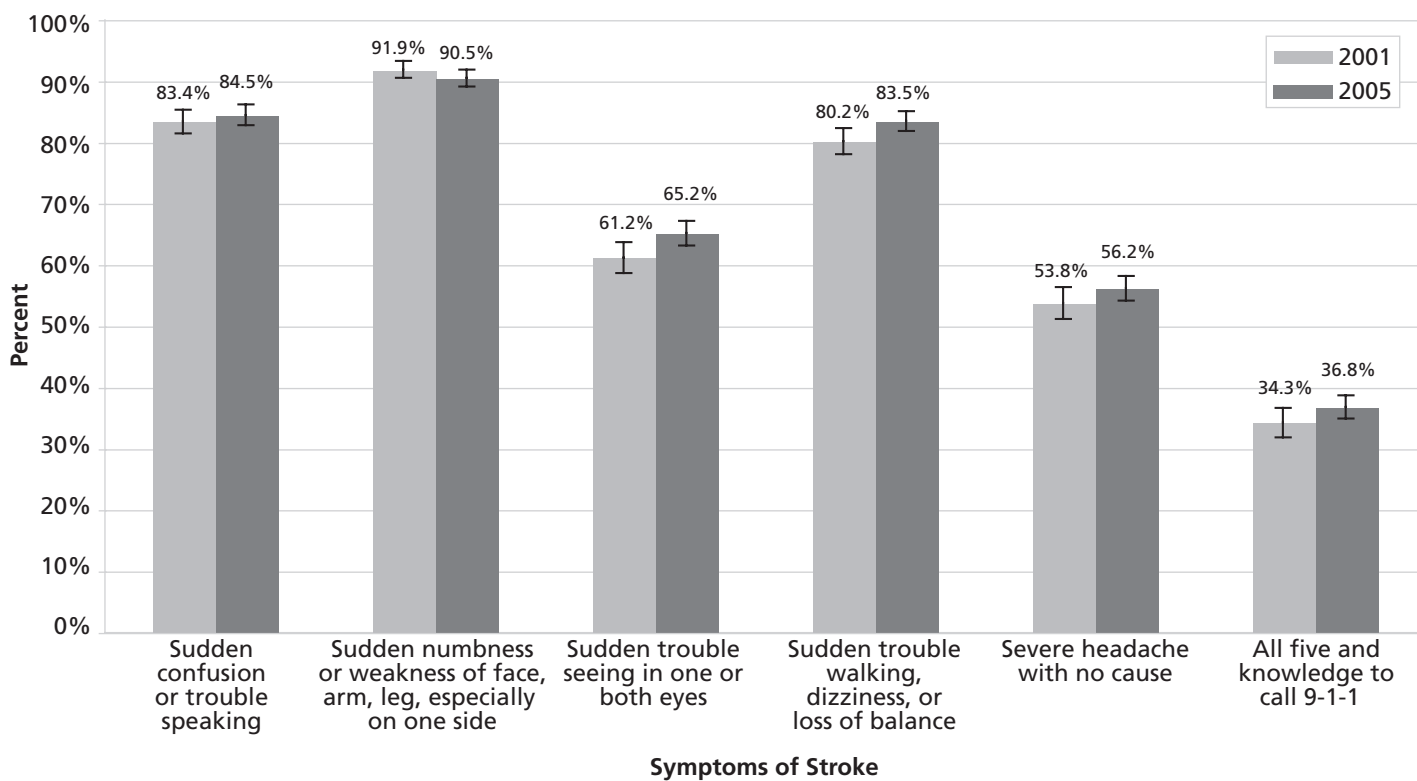
Public health interest in awareness of heart attack and stroke warning signs and symptoms increased in the past 10 years with the creation of Healthy People 2010 goals in 2000 and the 2001 launch of the American Heart Association and National Heart Lung and Blood Institute "Act in Time" campaign to increase awareness of heart attack warning signs and symptoms. Trend data indicate that overall recognition of the signs and symptoms of heart attack and stroke has not changed in New York between 2001 and 2005. One factor why a change was not observed may be that four years is a relatively short period of time to expect a population-level change in awareness. Data collected in the 2009 BRFSS on warning signs and symptoms of heart attack and stroke will offer an opportunity to examine changes in awareness over eight years.

Figure 1. Trends* in Recognition of Heart Attack Symptoms among Adults in New York State: 2001 and 2005 BRFSS



* Age-adjusted to 2000 US Census population

Figure 2. Trends* in Recognition of Stroke Symptoms among Adults in New York State: 2001 and 2005 BRFSS



* Age-adjusted to 2000 US Census population

Table 1. Percentage of adults aged 18 & over aware of certain heart attack warning signs and symptoms and who indicated "call 9-1-1" as the first action to take if they thought a person was having a heart attack or stroke, by selected characteristics, New York State Behavioral Risk Factor Surveillance System- 2005

Characteristic	Heart attack sign or symptom														
	Pain or discomfort in the jaw, neck, or back		Feeling weak, lightheaded, or faint		Chest pain or discomfort		Sudden trouble seeing in one or both eyes [DECOY§]		Pain or discomfort in the arms or shoulder		Shortness of breath		Calling 9-1-1 identified as first action		
	%#	(95% CI)*	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	
Total	47.4	(45.4-49.4)	61.3	(59.3-63.2)	91.6	(90.2-92.7)	40.1	(38.1-42.1)	83.5	(81.8-85.1)	84.0	(82.4-85.6)	86.9	(85.3-88.3)	
Region	NYS excluding NYC	53.5	(51.1-55.9)	64.4	(62.1-66.7)	93.4	(91.9-94.6)	40.4	(38.1-42.7)	88.2	(86.5-89.7)	86.2	(84.3-87.9)	87.1	(85.2-88.8)
	New York City	32.8	(29.5-36.2)	53.8	(50.0-57.6)	87.2	(84.2-89.6)	39.4	(35.8-43.2)	72.4	(68.5-76.0)	78.9	(75.5-82.0)	86.5	(83.5-89.0)
Age	18-24	31.1	(23.5-39.8)	61.5	(52.1-70.2)	93.0	(86.8-96.4)	35.9*	(27.4-45.5)	78.2	(69.2-85.1)	81.2	(72.7-87.4)	80.6	(71.8-87.1)
	25-34	31.6	(27.0-36.6)	62.3	(57.2-67.2)	89.4	(84.9-92.6)	36.3	(33.0-43.2)	78.5	(73.7-82.7)	80.7	(76.0-84.8)	86.1	(81.8-89.6)
	35-44	44.7	(40.7-48.8)	60.9	(56.7-64.9)	92.9	(89.9-95.0)	42.3	(38.2-46.4)	83.6	(79.9-86.7)	85.1	(81.7-87.9)	89.7	(86.8-92.0)
	45-54	54.4	(50.2-58.5)	64.3	(60.1-68.3)	95.0	(92.5-96.7)	42.4	(38.4-46.6)	89.8	(86.8-92.1)	89.9	(87.0-92.3)	89.6	(86.3-92.2)
	55-64	60.7	(56.3-64.9)	64.4	(60.1-68.4)	92.0	(88.9-94.3)	41.0	(36.8-45.3)	88.0	(84.7-90.7)	89.0	(85.8-91.6)	88.4	(85.0-91.1)
	65+	59.0	(55.2-62.6)	55.3	(51.6-59.0)	87.4	(84.4-89.9)	41.0	(37.5-44.7)	82.1	(79.0-84.9)	79.0	(75.7-82.0)	84.6	(81.7-87.1)
Race	White	53.8	(51.6-56.1)	65.1	(62.9-67.2)	94.4	(93.2-95.3)	40.8	(38.6-43.0)	88.9	(87.3-90.4)	87.4	(85.7-88.9)	87.5	(85.8-89.0)
	Black	35.4	(29.2-42.1)	47.8	(41.1-65.6)	85.8	(80.4-90.0)	37.0	(28.4-41.2)	72.3	(65.2-78.4)	79.0	(72.6-84.3)	85.2	(79.2-89.6)
	Hispanic	26.0	(20.3-32.7)	52.6	(45.5-59.6)	78.4	(71.3-84.2)	36.5	(30.0-43.6)	65.9	(58.8-72.4)	68.3	(60.9-74.8)	87.0	(81.1-91.3)
	Other	31.9	(24.8-39.9)	52.6	(43.4-61.6)	89.9	(83.3-94.1)	42.7	(34.0-51.8)	69.9	(60.4-77.9)	80.3	(72.6-86.2)	82.2	(72.4-89.0)
Sex	Male	42.0	(38.8-45.1)	59.5	(56.2-62.7)	90.2	(87.9-92.1)	41.9	(38.7-45.1)	80.5	(77.6-83.1)	82.3	(79.5-84.8)	83.5	(80.6-86.0)
	Female	52.3	(49.8-54.7)	62.9	(60.5-65.2)	92.7	(91.2-94.0)	38.5	(36.2-40.9)	86.2	(84.2-88.0)	85.6	(83.8-87.3)	90.0	(88.4-91.4)
Income	<\$15,000	38.9	(32.7-45.4)	47.4	(40.8-54.2)	78.3	(71.6-83.8)	38.7	(32.5-45.3)	66.0	(58.7-72.5)	67.5	(60.3-74.0)	87.8	(81.7-92.1)
	\$15,000-\$24,999	42.4	(37.1-47.8)	59.4	(53.9-64.6)	86.6	(81.7-90.4)	42.2	(36.9-47.8)	76.9	(71.7-81.3)	77.6	(72.3-82.1)	86.6	(82.6-89.8)
	\$25,000-\$34,999	39.7	(33.9-45.8)	57.7	(51.2-64.0)	90.2	(85.9-93.3)	36.4	(30.4-42.7)	84.8	(78.3-89.7)	83.0	(77.9-87.2)	85.0	(78.4-89.8)
	\$35,000-\$49,999	48.6	(43.4-53.8)	64.2	(59.0-69.1)	94.8	(92.0-96.7)	43.5	(38.4-48.8)	87.8	(83.6-91.0)	88.0	(83.0-91.7)	89.2	(85.7-92.0)
	\$50,000-\$74,999	55.7	(50.8-60.4)	65.5	(60.7-70.0)	93.1	(89.1-95.7)	39.7	(35.1-44.5)	88.9	(85.1-91.8)	88.0	(84.2-91.1)	88.2	(84.6-91.1)
	\$75,000 and greater	52.6	(48.6-56.5)	68.5	(64.7-72.1)	98.8	(97.6-99.4)	38.2	(34.5-42.1)	90.4	(87.6-92.6)	91.0	(88.5-83.0)	87.0	(83.6-89.7)
	missing†	43.2	(37.6-49.1)	53.0	(47.0-59.0)	87.5	(83.1-90.9)	42.7	(36.7-48.8)	76.3	(70.3-81.3)	80.0	(74.8-84.5)	84.0	(78.8-88.4)
Education	Less than high school (HS)	28.9	(22.4-36.4)	48.8	(40.4-57.2)	74.0	(65.7-80.9)	39.6	(31.4-48.4)	64.5	(56.3-72.0)	66.7	(57.9-74.4)	87.4	(79.1-92.6)
	High school or GED	43.6	(40.0-47.3)	55.2	(51.4-58.9)	89.7	(87.3-91.7)	39.7	(36.1-43.5)	80.8	(77.5-83.7)	80.1	(76.8-83.1)	87.0	(84.0-89.5)
	Some college	52.9	(48.7-57.0)	65.7	(61.5-69.6)	94.8	(92.2-96.5)	38.4	(34.5-42.4)	86.7	(82.9-89.8)	88.5	(85.8-90.7)	86.6	(83.2-89.4)
	College graduate	51.1	(48.0-54.1)	66.1	(63.2-68.9)	95.2	(93.5-96.4)	41.3	(38.3-44.3)	88.1	(85.7-90.1)	88.2	(86.0-90.2)	87.2	(84.8-89.2)
History of CHD or Angina or history of Heart Attack	Yes	62.0	(54.8-68.8)	65.7	(58.9-71.9)	86.8	(79.7-91.7)	45.5	(38.6-52.5)	78.6	(71.3-84.4)	85.4	(78.4-90.4)	88.4	(83.2-92.1)
	No	46.5	(44.4-48.5)	61.0	(58.9-63.1)	91.9	(90.5-93.0)	39.8	(37.7-41.8)	83.8	(82.1-85.5)	84.0	(82.3-85.6)	86.8	(85.2-88.3)
Diagnosed with HBP	Yes	59.3	(55.7-62.8)	61.5	(58.0-64.9)	91.2	(88.7-93.2)	36.1	(32.8-39.6)	86.2	(83.4-88.7)	85.8	(82.9-88.3)	88.2	(85.6-90.4)
	No	43.5	(41.1-45.8)	61.3	(58.9-63.6)	91.7	(90.1-93.1)	41.4	(39.0-43.8)	82.7	(80.6-84.6)	83.5	(81.5-85.3)	86.5	(84.6-88.2)
Elevated Cholesterol	Yes	58.8	(55.5-62.0)	60.6	(57.3-63.8)	92.5	(90.5-94.1)	41.2	(38.0-44.4)	89.0	(86.7-90.9)	86.1	(83.5-88.3)	88.0	(85.7-89.9)
	No	47.9	(45.2-50.5)	64.1	(61.5-66.7)	93.2	(91.6-94.6)	39.6	(37.0-42.2)	84.8	(82.5-86.8)	86.1	(84.0-87.9)	87.8	(85.7-89.5)

Weighted percentage

‡ Confidence interval

§ Represents respondents who properly identified the item as a decoy.

* Estimates based on fewer than 50 observations.

† "Missing" category included because more than 10% of the sample did not report income.

Table 2. Percentage of adults aged 18 & over aware of certain stroke warning signs and symptoms and who indicated "call 9-1-1" as the first action to take if they thought a person was having a heart attack or stroke, by selected characteristics, New York State Behavioral Risk Factor Surveillance System- 2005

Characteristic		Stroke sign or symptom													
		Sudden confusion or trouble speaking		Sudden numbness or weakness of face, arm, leg, esp. on one side		Sudden trouble seeing in one or both eyes		Sudden chest pain or discomfort [DECOYS]		Sudden trouble walking, dizziness, or loss of balance		Severe headache with no known cause		Calling 9-1-1 identified as first action	
		%#	(95% CI)*	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Total		84.7	(83.0-86.2)	90.6	(89.3-91.8)	65.4	(63.4-67.3)	37.5	(35.6-39.5)	83.4	(81.8-84.9)	56.4	(54.4-58.5)	86.9	(85.3-88.3)
Region	NYS excluding NYC	88.9	(87.1-90.5)	92.5	(91.0-93.8)	69.1	(66.7-71.3)	38.8	(36.5-41.2)	86.9	(85.2-88.3)	59.0	(56.6-61.3)	87.1	(85.2-88.8)
	New York City	74.6	(70.9-78.0)	86.0	(83.0-88.5)	56.7	(52.8-60.4)	34.3	(30.8-38.0)	75.1	(71.5-78.5)	50.5	(46.6-54.3)	86.5	(83.5-89.0)
Age	18-24	76.8	(67.7-75.4)	85.2	(77.8-90.5)	54.2	(44.9-63.1)	35.3	(26.9-44.7)	85.6	(77.5-91.1)	39.9	(31.4-49.0)	80.6	(71.8-87.1)
	25-34	80.3	(75.4-84.3)	88.5	(84.3-91.7)	62.3	(57.1-67.2)	36.7	(31.9-41.8)	80.6	(76.1-84.4)	55.0	(49.8-60.1)	86.1	(81.8-89.6)
	35-44	85.5	(82.1-88.3)	91.8	(89.0-93.9)	66.9	(62.8-70.7)	40.0	(36.0-44.1)	82.2	(78.7-85.2)	57.6	(53.5-61.7)	89.7	(86.8-92.0)
	45-54	90.5	(87.9-92.6)	94.6	(92.4-96.1)	71.4	(67.5-75.0)	43.7	(39.6-47.8)	88.9	(85.9-91.3)	61.8	(57.7-65.8)	89.6	(86.3-92.2)
	55-64	88.8	(85.8-91.3)	92.3	(89.5-94.5)	69.8	(65.6-73.7)	37.5	(33.5-41.8)	84.3	(80.5-87.4)	62.6	(58.3-66.7)	88.4	(85.0-91.1)
	65+	84.2	(81.1-86.9)	89.5	(86.9-91.6)	64.9	(61.3-68.3)	30.4	(27.1-33.8)	80.3	(76.9-83.2)	57.8	(54.0-61.4)	84.6	(81.7-87.1)
Race	White	91.2	(89.9-92.4)	94.0	(92.8-95.0)	70.6	(68.4-72.6)	40.7	(38.5-42.9)	87.6	(86.1-89.0)	58.7	(56.5-61.0)	87.5	(85.8-89.0)
	Black	78.3	(72.4-83.2)	88.9	(84.2-92.4)	53.4	(46.6-60.1)	25.2	(19.9-31.3)	75.9	(69.4-81.4)	53.2	(46.4-60.0)	85.2	(79.2-89.6)
	Hispanic	56.5	(49.2-63.5)	73.4	(66.3-79.4)	48.7	(41.7-55.8)	30.1	(23.9-37.1)	67.6	(60.7-73.7)	53.4	(46.3-60.4)	87.0	(81.1-91.3)
	Other	71.1	(60.8-79.6)	84.5	(77.3-89.6)	52.5	(43.4-61.4)	32.3	(24.2-41.7)	73.5	(63.9-81.3)	41.3	(33.2-50.0)	82.2	(72.4-89.0)
Sex	Male	81.1	(78.2-83.7)	88.3	(85.9-90.4)	64.1	(60.8-67.2)	39.5	(36.3-42.7)	82.6	(80.0-84.9)	52.0	(48.8-55.3)	83.5	(80.6-86.0)
	Female	87.9	(86.1-89.6)	92.6	(91.2-93.8)	66.6	(64.1-68.9)	35.7	(33.5-38.0)	84.2	(82.1-86.0)	60.4	(57.9-62.8)	90.0	(88.4-91.4)
Income	<\$15,000	68.2	(61.2-74.5)	78.7	(71.9-84.2)	49.2	(42.4-56.0)	33.3	(27.0-40.2)	69.8	(62.9-75.9)	49.9	(43.2-56.7)	87.8	(81.7-92.1)
	\$15,000-\$24,999	77.8	(72.1-82.7)	82.7	(77.4-87.0)	58.1	(52.5-63.6)	30.4	(25.7-35.6)	76.4	(71.3-80.8)	51.5	(46.0-57.0)	86.6	(82.6-89.8)
	\$25,000-\$34,999	77.1	(70.1-82.9)	90.6	(86.3-93.6)	56.7	(50.2-63.1)	28.2	(22.6-34.4)	79.9	(73.6-85.0)	49.2	(42.8-55.6)	85.0	(78.4-89.8)
	\$35,000-\$49,999	87.3	(83.4-90.3)	93.4	(90.4-95.5)	64.0	(58.5-69.1)	32.2	(27.8-37.0)	84.1	(80.0-87.4)	55.0	(49.7-60.3)	89.2	(85.7-92.0)
	\$50,000-\$74,999	92.7	(89.5-95.0)	94.8	(92.0-96.6)	71.5	(66.8-75.8)	42.1	(37.5-46.8)	91.6	(88.7-93.9)	65.4	(60.6-69.9)	88.2	(84.6-91.1)
	\$75,000 and greater missing†	92.9 80.9	(90.5-94.7) (75.5-85.3)	97.3 85.4	(95.7-98.4) (80.5-89.3)	77.8 61.0	(74.2-81.1) (55.2-66.6)	45.2 41.1	(41.3-49.1) (35.1-47.4)	91.2 76.2	(88.6-93.3) (70.8-80.8)	60.4 54.7	(56.4-64.3) (48.6-60.6)	87.0 84.0	(83.6-89.7) (78.8-88.4)
Education	Less than high school (HS)	59.4	(50.7-67.6)	74.6	(66.8-81.0)	40.7	(32.6-49.2)	25.4	(18.3-34.0)	69.0	(61.3-75.7)	42.4	(34.4-50.7)	87.4	(79.1-92.6)
	High school or GED	81.4	(78.2-84.2)	86.9	(83.9-89.4)	56.5	(52.7-60.2)	30.5	(27.0-34.2)	77.5	(74.1-80.5)	49.9	(46.2-53.7)	87.0	(84.0-89.5)
	Some college	87.6	(84.2-90.3)	94.2	(92.0-95.8)	68.7	(64.5-72.6)	36.4	(32.5-40.4)	87.0	(83.7-89.7)	61.6	(57.4-65.6)	86.6	(83.2-89.4)
	College graduate	91.2	(89.2-92.9)	94.8	(93.1-96.1)	75.6	(72.9-78.2)	45.8	(42.8-48.8)	89.1	(87.0-90.9)	61.3	(58.2-64.2)	87.2	(84.8-89.2)
Diagnosed with HBP	Yes	85.2	(82.3-87.7)	91.3	(89.1-93.1)	67.6	(64.3-70.8)	34.6	(31.2-38.1)	84.0	(81.1-86.6)	62.3	(58.8-65.7)	88.2	(85.6-90.4)
	No	84.6	(82.5-86.4)	90.4	(88.8-91.9)	64.7	(62.3-67.0)	38.5	(36.2-40.8)	83.2	(81.3-85.0)	54.5	(52.1-57.0)	86.5	(84.6-88.2)
History of Stroke	Yes	89.8	(81.3-94.7)	88.3	(77.0-94.4)	73.9	(62.6-82.7)	41.8*	(30.5-54.0)	80.0	(68.5-88.0)	51.7*	(39.7-63.6)	85.8	(76.8-91.7)
	No	84.6	(82.9-86.2)	90.6	(89.3-91.9)	65.3	(63.2-67.2)	37.4	(35.5-39.4)	83.5	(81.9-85.0)	56.5	(54.4-58.5)	86.9	(85.3-88.4)

Weighted percentage

‡ Confidence interval

§ Represents respondents who properly identified the item as a decoy.

* Estimates based on fewer than 50 observations.

† "Missing" category included because more than 10% of the sample did not report income.

Table 3. Percentage of adults aged 18 & over aware of heart attack and stroke warning signs and symptoms and who indicated “call 9-1-1” as the first action to take if they thought a person was having a heart attack or stroke, by selected characteristics, New York State Behavioral Risk Factor Surveillance System- 2005

Characteristic		Heart Attack				Stroke			
		Aware of all five signs and symptoms§		Aware of all five signs and symptoms and indicated calling 9-1-1 as first action		Aware of all five signs and symptoms¶		Aware of all five signs and symptoms and indicated calling 9-1-1 as first action	
		%#	(95% CI)*	%	(95% CI)	%	(95% CI)	%	(95% CI)
Total		32.0	(30.3-33.8)	28.5	(26.9-30.3)	41.8	(39.9-43.7)	37.1	(35.3-39.0)
Region	NYS excluding NYC	36.2	(34.1-38.5)	32.4	(30.4-34.6)	45.2	(42.9-47.6)	40.7	(38.5-43.0)
	New York City	22.0	(19.2-25.0)	19.3	(16.8-22.1)	33.6	(30.1-37.2)	28.5	(25.3-32.0)
Age	18-24	20.0	(13.9-27.9)	14.7 *	(9.6-21.9)	27.2 *	(20.1-35.8)	23.1 *	(16.4-31.4)
	25-34	21.4	(17.6-25.7)	19.8	(16.1-24.0)	38.2	(33.4-43.3)	35.3	(30.6-40.3)
	35-44	28.5	(25.0-32.6)	25.4	(22.0-29.0)	41.6	(37.6-45.7)	37.1	(33.3-41.1)
	45-54	40.3	(36.3-44.3)	38.0	(34.1-42.0)	49.3	(45.2-53.4)	44.0	(40.0-48.1)
	55-64	44.5	(40.3-48.9)	40.4	(36.2-44.7)	49.1	(44.8-53.5)	43.4	(39.2-47.7)
	65+	36.5	(33.0-40.1)	31.3	(28.0-34.8)	42.0	(38.4-45.7)	36.4	(32.9-40.1)
Race	White	36.9	(34.8-39.0)	33.1	(31.0-35.1)	46.6	(44.4-48.8)	41.6	(39.4-43.8)
	Black	23.1	(17.8-29.3)	19.6	(14.9-25.5)	37.1	(30.8-43.9)	31.2	(25.4-37.6)
	Hispanic	16.2	(11.9-21.7)	14.8	(10.7-20.1)	24.6	(19.1-31.1)	22.2	(16.9-28.5)
	Other	19.2	(14.0-25.8)	16.0 *	(11.3-22.3)	25.2	(18.9-32.8)	21.8	(15.9-29.1)
Sex	Male	26.9	(24.2-29.7)	23.1	(20.6-25.7)	37.3	(34.2-40.4)	32.2	(29.4-35.3)
	Female	36.6	(34.4-38.9)	33.5	(31.3-35.7)	45.8	(43.4-48.2)	41.5	(39.1-43.9)
Income	<\$15,000	22.1	(17.5-27.5)	21.0	(16.5-26.4)	28.1	(22.7-34.2)	26.7	(21.4-32.8)
	\$15,000-\$24,999	25.2	(21.0-30.0)	21.9	(17.8-26.5)	33.7	(28.9-38.8)	29.8	(25.2-34.8)
	\$25,000-\$34,999	25.5	(20.9-30.7)	23.1	(18.7-28.1)	33.4	(28.0-39.3)	29.4	(24.3-35.0)
	\$35,000-\$49,999	32.5	(28.2-37.2)	28.7	(24.6-33.2)	39.3	(34.4-44.4)	35.1	(30.4-40.1)
	\$50,000-\$74,999	38.1	(33.6-42.8)	34.2	(29.9-38.8)	51.3	(46.5-56.1)	45.7	(40.9-50.5)
	\$75,000 and greater	39.2	(35.4-43.1)	35.2	(31.6-38.9)	51.4	(47.4-55.4)	46.1	(42.2-50.1)
	missing†	29.4	(24.5-34.8)	25.2	(20.6-30.3)	38.5	(32.8-44.5)	32.2	(26.8-38.1)
Education	Less than high school (HS)	16.5	(12.0-22.2)	15.3	(11.0-21.0)	18.5	(13.5-24.8)	17.3	(12.5-23.4)
	High school or GED	27.1	(24.1-30.4)	24.4	(21.5-27.7)	33.5	(30.1-37.1)	30.2	(26.9-33.7)
	Some college	35.8	(32.1-39.7)	32.3	(28.8-36.1)	46.7	(42.6-50.8)	41.9	(37.9-46.0)
	College graduate	36.9	(34.1-39.8)	32.3	(29.6-35.0)	50.1	(47.1-53.2)	43.9	(40.9-46.9)
Diagnosed with HBP	Yes	41.1	(37.7-44.5)	37.0	(33.7-40.4)	45.0	(41.5-48.6)	40.7	(37.2-44.2)
	No	29.1	(27.0-31.2)	25.8	(23.9-27.8)	40.7	(38.4-43.1)	36.0	(33.8-38.2)
History of CHD or Angina or history of Heart Attack	Yes	44.0	(37.2-51.1)	41.2	(34.5-48.3)	-----	-----	-----	-----
	No or don't know	31.3	(29.5-33.1)	27.8	(26.1-29.6)	-----	-----	-----	-----
Elevated Cholesterol	Yes	39.3	(36.1-42.5)	35.6	(32.5-38.8)	-----	-----	-----	-----
	No	33.8	(31.4-36.2)	29.8	(27.6-32.2)	-----	-----	-----	-----
History of Stroke	Yes	-----	-----	-----	-----	44.0 *	(32.4-56.2)	39.1 *	(27.8-51.7)
	No	-----	-----	-----	-----	41.7	(39.7-43.7)	37.0	(35.1-39.0)

Weighted percentage

‡ Confidence interval

§ Five signs and symptoms of heart attack: 1) pain or discomfort in jaw, neck or back; 2) weak, lightheaded, or faint; 3) chest pain or discomfort; 4) pain or discomfort in arms or shoulder; and 5) shortness of breath.

¶ Five signs and symptoms of stroke: 1) sudden confusion or trouble speaking; 2) sudden numbness or weakness of face, arm, leg, esp. on one side; 3) sudden trouble seeing in one or both eyes; 4) sudden trouble walking, dizziness, or loss of balance; and 5) severe headache with no known cause.

* Estimates based on fewer than 50 observations.

† “Missing” category included because more than 10% of the sample did not report income.

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