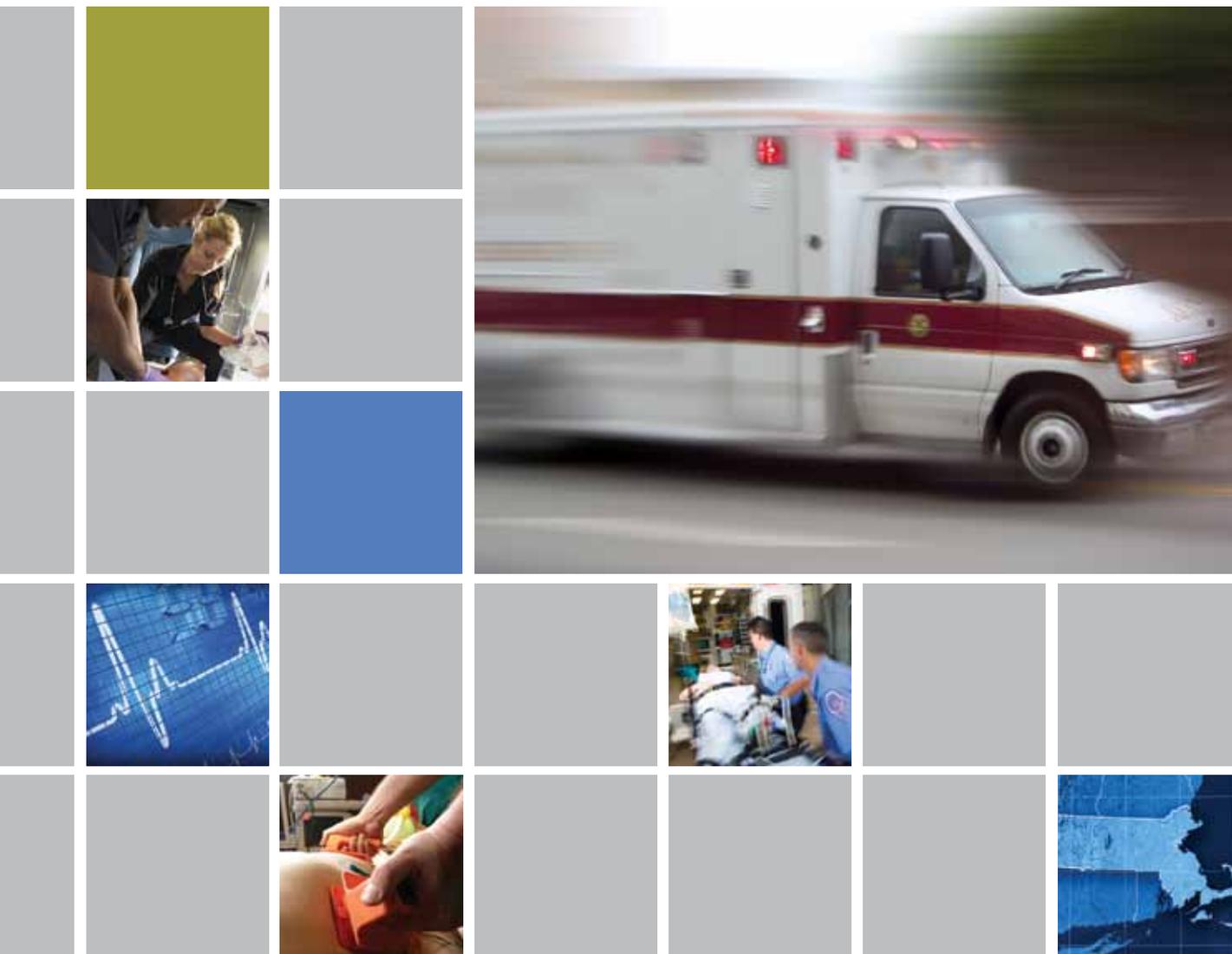


Survey of EMS Practices for Heart Disease and Stroke

Massachusetts Summary of Results



Survey of EMS Practices for Heart Disease and Stroke: Summary of Results

Background

Heart and stroke-related deaths are, respectively, the first and fourth leading causes of mortality in the United States and major causes of disability. The most current comprehensive statistics on cardiovascular disease from the American Heart Association, published in February 2011, show that an estimated 82,600,000 American adults (1 in 3) have one or more types of cardiovascular disease. It is estimated that approximately 1,255,000 heart attacks and 795,000 strokes will occur in 2011. Also, statistics show that approximately 1 in 6 deaths are due to coronary heart disease (the most common type of heart disease) and 1 in 18 deaths are due to stroke.¹

Approximately half of heart- and stroke-related deaths² occur before a patient arrives at a hospital, underscoring the important role of pre-hospital emergency medical care in the “chain of survival” for heart attack and stroke. The statistics for cardiac arrest are difficult to pinpoint, but the best estimates are a survival rate of just 7.6%.³ Time to treatment is critical for these patients, and rapid emergency medical services (EMS) response, intervention, and transport to specialized medical facilities is essential for positive patient outcomes. The Institute of Medicine has noted, however, that across the United States, the delivery of emergency care across the health care system is fragmented, which could influence timeliness and quality of care provided for cardiovascular-related emergencies.⁴

Survey Objectives

In light of the important role of pre-hospital care in the treatment of heart and stroke events, the Division for Heart Disease and Stroke Prevention (DHDSP) at the Centers for Disease Control and Prevention (CDC) conducted a survey of state and

local EMS managers to better understand EMS capacity for emergency care of acute cardiovascular events. DHDSP developed this survey as part of its mission to increase early detection and treatment of heart disease and stroke, promote coordinated systems of care policies, enhance collaboration between CDC and state and local agencies, and identify at-risk populations to help eliminate disparities. The survey also serves to inform CDC programs in their designated role to support EMS through the Federal Interagency Committee on EMS (FICEMS).

Survey Response Rates for the 9 Participating States

State	Percent Responded
Florida	76.7
Massachusetts	74.8
Kansas	71.1
Montana	69.8
New Mexico	50.2
Wisconsin	67.6
Oregon	71.7
South Carolina	57.4
Arkansas	60.9

EMS Agency Personnel*

	Massachusetts			All 9 States		
	Total	Min [†]	Max [‡]	Total	Min [†]	Max [‡]
Volunteer Staff						
EMT-Basic	951	0	60	8,514	0	100
EMT-Intermediate	75	0	12	2,520	0	60
EMT-Paramedic	113	0	22	934	0	50
Paid Staff						
EMT-Basic	3,461.5	0	100	14,769.6	0	100
EMT-Intermediate	448	0	50	3,139.3	0	75
EMT-Paramedic	2,252	0	100	16,159.9	0	100

* Source: Survey of EMS Practices for Heart Disease and Stroke, 2008.

[†] The smallest number of staff reported from a single agency.

[‡] The largest number of staff reported from a single agency.

EMS Agency Call Volume*

	Massachusetts			All 9 States		
	Total	Min [†]	Max [‡]	Total	Min [†]	Max [‡]
Total non-fire	676,638	15	60,000	4,749,605	1	130,000
Chest pain	58,416	0	4,800	453,831	0	25,200
Cardiac arrest	4,648	0	300	58,703	0	2,400
Stroke	20,910	0	1,800	143,711	0	9,600

* Source: Survey of EMS Practices for Heart Disease and Stroke, 2008. Results reported are approximate numbers. When respondents reported a range for the number of received calls, an average of the two numbers was reported.

[†] The smallest number of calls reported from a single agency.

[‡] The largest number of calls reported from a single agency.

Survey Description

The survey consisted of 46 questions covering location and characteristics of the service area; basic descriptive information, such as EMS capacity, service levels, and types of care provided; medical direction; heart attack and stroke patient encounters; and transportation protocols. Also included was a list of 18 medical interventions (i.e., medications, devices, and procedures) relevant to emergency medical care for out-of-hospital cardiovascular crises.

The computer-assisted standardized telephone survey was administered by trained interviewers to 1,292 ground-based emergency care agency supervisors in nine states (Florida, Massachusetts, Kansas, Montana, New Mexico, Wisconsin, Oregon, South Carolina, and Arkansas). The response rate for each state ranged from 50.2% to 76.7%. The survey was designed by a team of researchers based on

literature reviews and recommendations of a panel of emergency care experts to devise a set of questions relevant to assessing cardiovascular emergency care capabilities.

Results

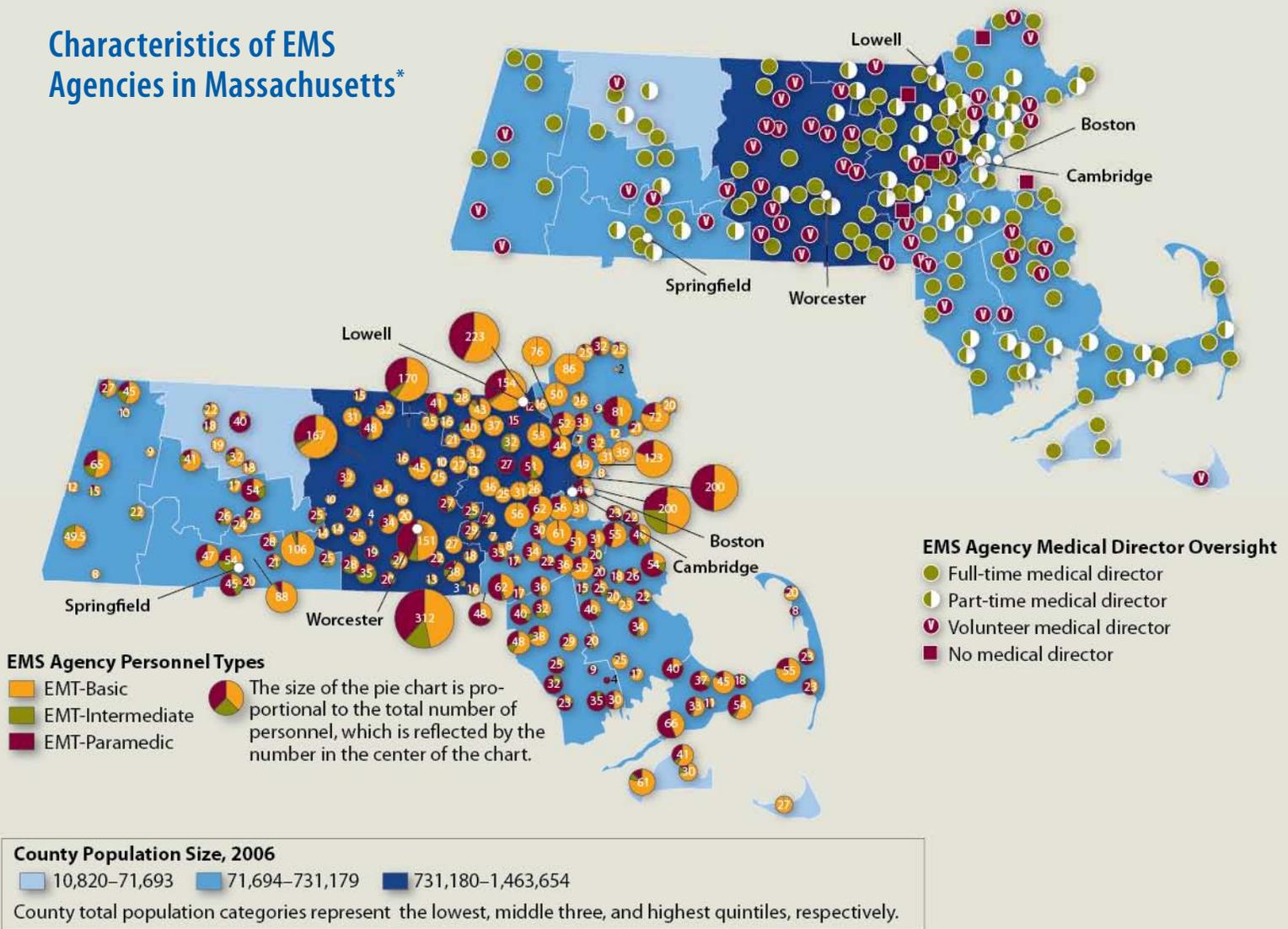
There are nine separate state summaries—one for each of the states that participated in the survey. Each state summary report provides an overview of the state-specific results and comparison data for all nine states combined. The tables and maps in this summary are survey results from participating EMS agencies in Massachusetts.

These data will be useful for state and local EMS agencies and policymakers to provide a snapshot of heart- and stroke-related emergency response policies and personnel capabilities as well as highlight the importance of these policies for providing care to residents. These data also will provide

a useful planning resource for state and local EMS providers and serve as the basis for continued dialogue with CDC to help the agency better understand the critical care challenges that face EMS and identify ways that CDC can support emergency response for cardiovascular disease.

1. Roger VL, Go AS, Lloyd-Jones DM, et al. Heart disease and stroke statistics—2011 update. A report from the American Heart Association. *Circulation*. 2011;123:e18–e209.
2. Centers for Disease Control and Prevention. State specific mortality from sudden cardiac death: United States, 1999. *MMWR*. 2002;51(6):123–126.
3. Sasson C, Rogers MA, Dahl J, Kellerman AL. Predictors of survival from out-of-hospital cardiac arrest: A systematic review and meta-analysis. *Circ Cardiovasc Qual Outcomes*. 2010;3:63–81.
4. Institute of Medicine, Committee on the Future of Emergency Care in the United States Health System. *Emergency Medical Services: At the Crossroads*. Washington, DC: National Academies Press; 2007.

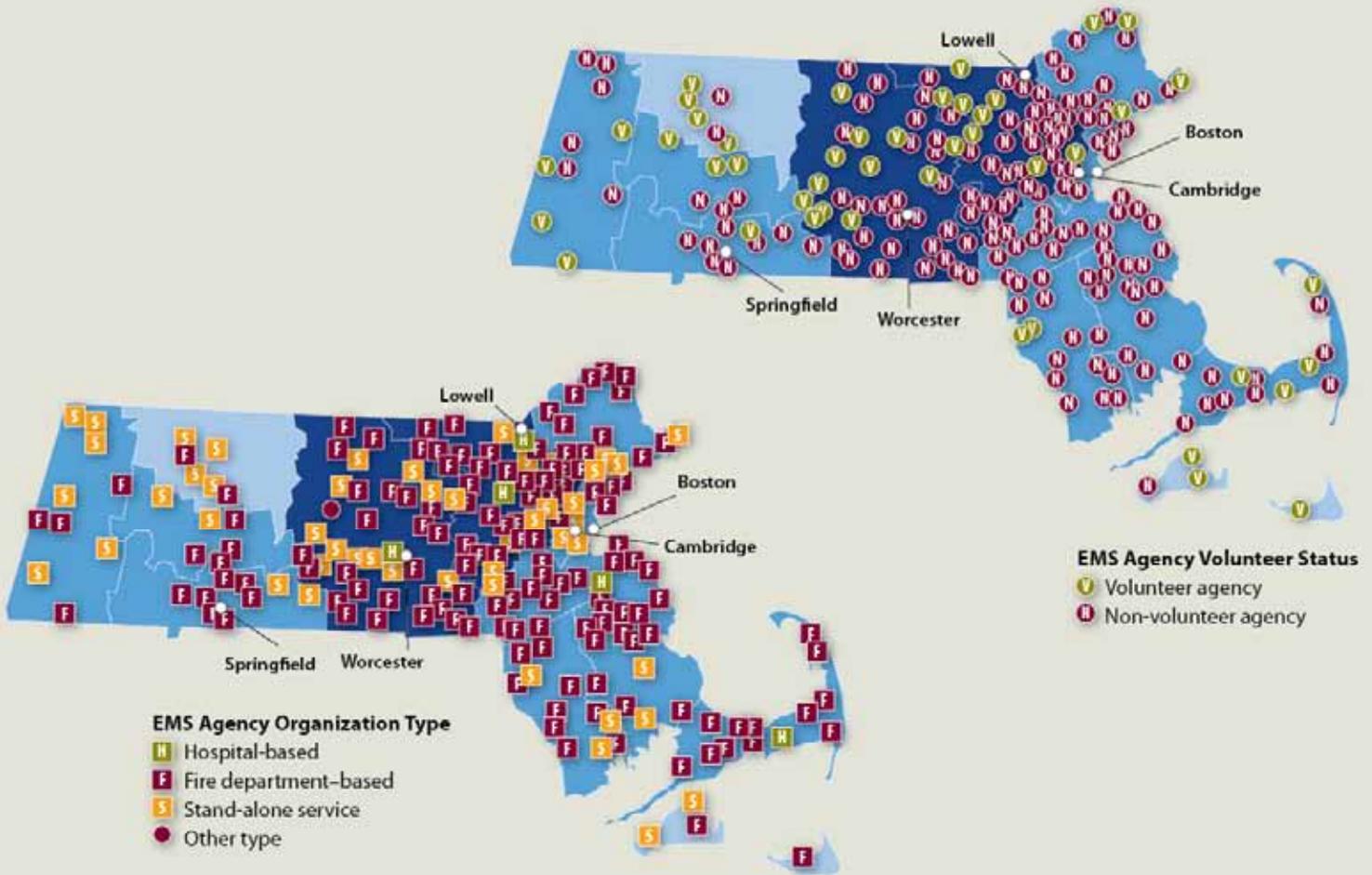
Characteristics of EMS Agencies in Massachusetts*



EMS Scope of Practice for Cardiovascular Events: Percentage of EMS Agencies That Authorize EMTs to Perform Each Intervention*

Interventions	Massachusetts			All 9 States		
	EMT-Basic (%)	EMT-Intermediate (%)	EMT-Paramedic (%)	EMT-Basic (%)	EMT-Intermediate (%)	EMT-Paramedic (%)
Thrombolytic agent	0.0	0.0	15.1	0.6	1.6	25.1
Morphine or equivalent	0.0	0.0	91.5	0.5	27.7	91.6
Surgical airway	0.5	3.5	64.1	0.6	2.2	78.8
Beta blocker	0.5	0.9	84.9	0.6	5.6	78.2
Anti-arrhythmic medication	0.5	0.0	87.6	0.7	24.0	93.2
Pressor agent	0.5	1.7	83.0	0.8	9.9	86.3
Central IV	0.5	11.3	19.1	1.0	15.2	35.0
Endotracheal intubation	1.1	87.0	92.8	8.7	41.0	95.4
Peripheral IV	2.7	88.7	92.8	9.2	93.3	97.1
Nitroglycerin from EMT supply	3.8	7.0	87.6	15.5	56.4	95.0
12-lead ECG	7.0	9.6	88.9	22.8	36.7	88.2
Monitor end-tidal CO2	8.1	34.8	88.2	26.4	45.0	90.2
Aspirin (ASA) from EMT supply	89.7	88.7	99.4	63.7	80.8	98.1
Alternate mechanical airway	4.8	75.4	92.8	66.7	91.9	97.0
Glucometry	77.4	86.1	95.4	83.9	95.3	98.2
Assistance with patient's nitroglycerin	91.4	93.0	98.0	86.7	91.6	93.1
Assistance with patient's aspirin	95.1	96.5	96.1	87.6	91.6	94.0
Pulse oximetry	94.1	97.4	100.0	93.8	98.0	99.1

* Source: Survey of EMS Practices for Heart Disease and Stroke, 2008. In Massachusetts, 196 EMS agencies participated in the survey. In the total 9 states, 1,292 EMS agencies participated in the survey. However, not all of the respondents answered all questions in the survey. Therefore, the proportions reported may have slightly different denominators. Results displayed are not comprehensive and do not reflect all important characteristics for cardiovascular emergency response.



* EMS agency is represented at the centroid of the ZIP code in which it is located. In ZIP codes where multiple agencies responded to the survey, agencies are slightly offset from the centroid. All EMS agencies in the state are not represented on this map. Only EMS agencies that responded to the survey and answered the questions relevant to each map are included here.

EMS Agency Characteristics That Are Important for Cardiovascular Emergency Response*

		Massachusetts		All 9 States	
Number of Agencies that Responded to Survey		196		1,292	
		Count	(%)	Count	(%)
Location	Rural	14	7.1	665	51.5
	Urban	182	92.9	627	48.5
Organization Type	Fire based	144	73.5	756	58.5
	Non-fire based	52	26.5	536	41.5
Volunteer Status	Volunteer	44	22.6	545	42.4
	Non-volunteer	151	77.4	672	55.2
Medical Director Involvement	Full-time	90	47.1	520	40.9
	Part-time	49	25.7	354	27.8
	Volunteer	46	24.1	383	30.1
	No medical director	6	3.1	15	1.2
	Involvement in past 4 weeks	86	46.7	633	50.4
Communication Center	Prioritizes dispatching	118	61.1	678	54.2
	Provides caller with CPR instructions	112	59.6	861	69.5
	Uses automatic vehicle location technology	22	11.4	210	16.6
Highest EMS Level of Life Support	Basic life support	30	15.6	187	15.6
	Intermediate life support	28	14.6	187	15.6
	Advanced life support	134	69.8	828	68.9
Online Immediate Access to Medical Consultation	Always, 24 hours a day, 7 days a week	184	94.4	1,155	90.3
	Sometimes, less than 24 hours a day	5	2.6	88	6.9
	Never	6	3.1	36	2.8
Provides On-Scene Time Benchmark	Chest pain or suspected heart attack	173	88.7	1,045	82.0
	≤ 15 min	146	84.9	914	87.7
	> 15 min	26	15.1	128	12.3
	Cardiac arrest	163	84.0	969	76.1
	≤ 15 min	131	80.4	806	83.4
	> 15 min	32	19.6	160	16.6
	Stroke	173	89.2	1,037	81.4
	≤ 15 min	148	85.6	921	89.1
> 15 min	25	14.4	113	10.9	
Uses Stroke Scale for Diagnosing Stroke		188	96.4	1,018	80.3
Patient Information to Receiving Hospital in Advance of Arrival	Yes	191	99.5	1,158	96.3
	No	1	0.5	45	3.7
New Therapy or Technology Adopted for Stroke in the Past Year					
Most common therapies/technologies reported (if specified):					
Immediate transport to specialized stroke center if accessible		15	23.1	399	31.4
Update to stroke protocol - understand point of entry					
Update to stroke protocol - statewide protocol changes					
Funding Basis	Private for-profit	17	8.7	102	8.0
	Private not-for-profit	20	10.3	184	14.4
	Public/government	153	78.5	933	72.8
	Public-private partnership	191	98.0	62	4.8
System Capabilities	Basic 9-1-1 system	12	6.2	160	12.6
	Enhanced 9-1-1 system	175	90.2	1,073	84.2
	Other	7	3.6	41	3.2

* Source: Survey of EMS Practices for Heart Disease and Stroke, 2008. In Massachusetts, 196 EMS agencies participated in the survey. In the total 9 states, 1,292 EMS agencies participated in the survey. However, not all of the respondents answered all questions in the survey. Therefore, the proportions reported may have slightly different denominators. Results displayed are not comprehensive and do not reflect all important characteristics for cardiovascular emergency response.



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