

# Survey of EMS Practices for Heart Disease and Stroke

## Wisconsin 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.<sup>1</sup>

Approximately half of heart- and stroke-related deaths<sup>2</sup> 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%.<sup>3</sup> 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.<sup>4</sup>

## 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\*

	Wisconsin			All 9 States		
	Total	Min <sup>†</sup>	Max <sup>‡</sup>	Total	Min <sup>†</sup>	Max <sup>‡</sup>
<b>Volunteer Staff</b>						
EMT-Basic	2,332	0	42	8,514	0	100
EMT-Intermediate	1,283	0	60	2,520	0	60
EMT-Paramedic	164	0	20	934	0	50
<b>Paid Staff</b>						
EMT-Basic	1,864.5	0	100	14,769.6	0	100
EMT-Intermediate	647	0	30	3,139.3	0	75
EMT-Paramedic	1,663	0	100	16,159.9	0	100

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

<sup>†</sup> The smallest number of staff reported from a single agency.

<sup>‡</sup> The largest number of staff reported from a single agency.

## EMS Agency Call Volume\*

	Wisconsin			All 9 States		
	Total	Min <sup>†</sup>	Max <sup>‡</sup>	Total	Min <sup>†</sup>	Max <sup>‡</sup>
Total non-fire	484,534	45	65,000	4,749,605	1	130,000
Chest pain	48,617	3	7,200	453,831	0	25,200
Cardiac arrest	7,776	0	744	58,703	0	2,400
Stroke	16,932	0	1,200	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.

<sup>†</sup> The smallest number of calls reported from a single agency.

<sup>‡</sup> 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

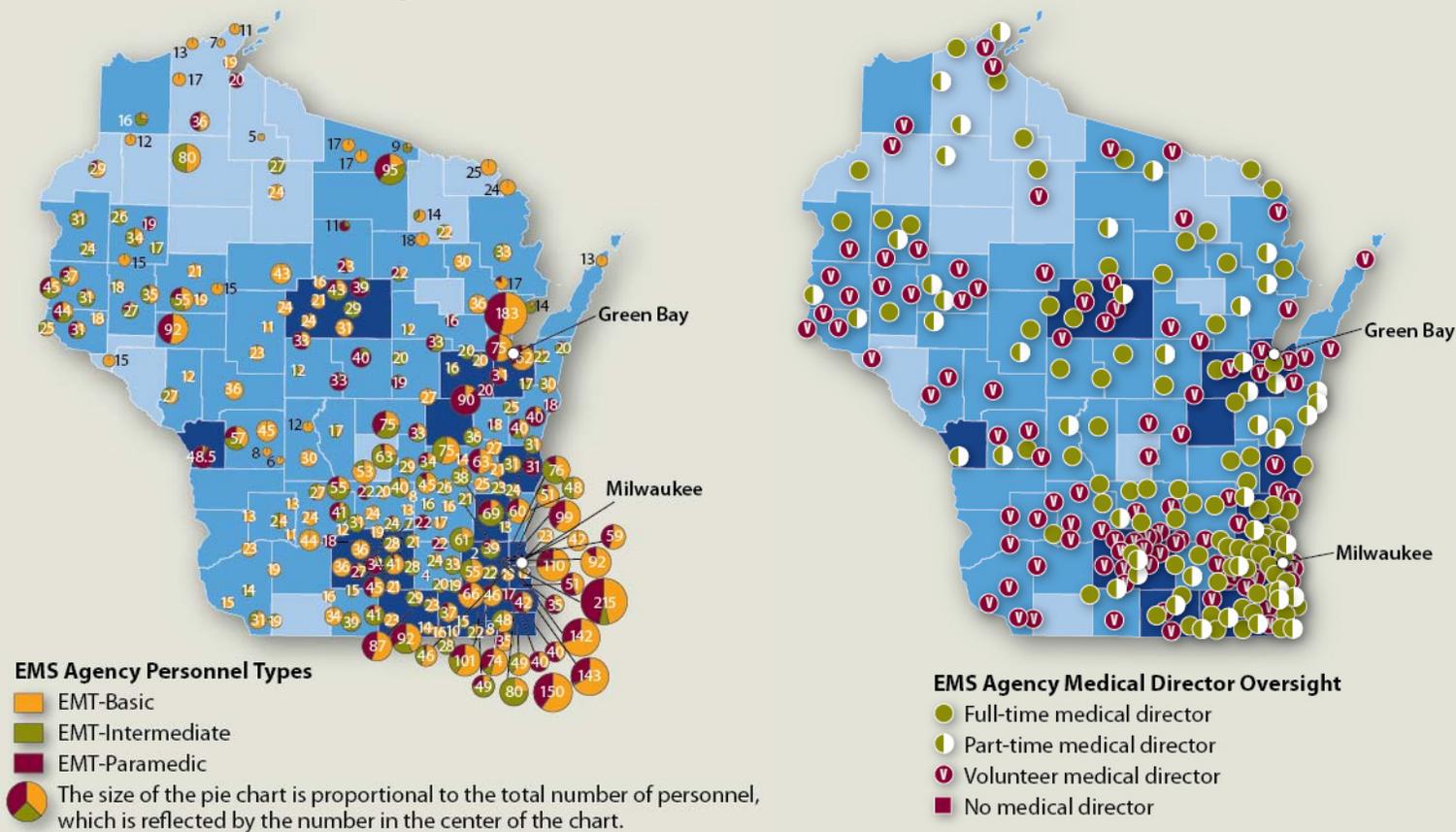
There are nine separate state summaries—one for each of the states that participated in the survey. Each state summary report provides an overview of the state-specific results and comparison data for all nine states combined. The tables and maps in this summary are survey results from participating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

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 Wisconsin\*

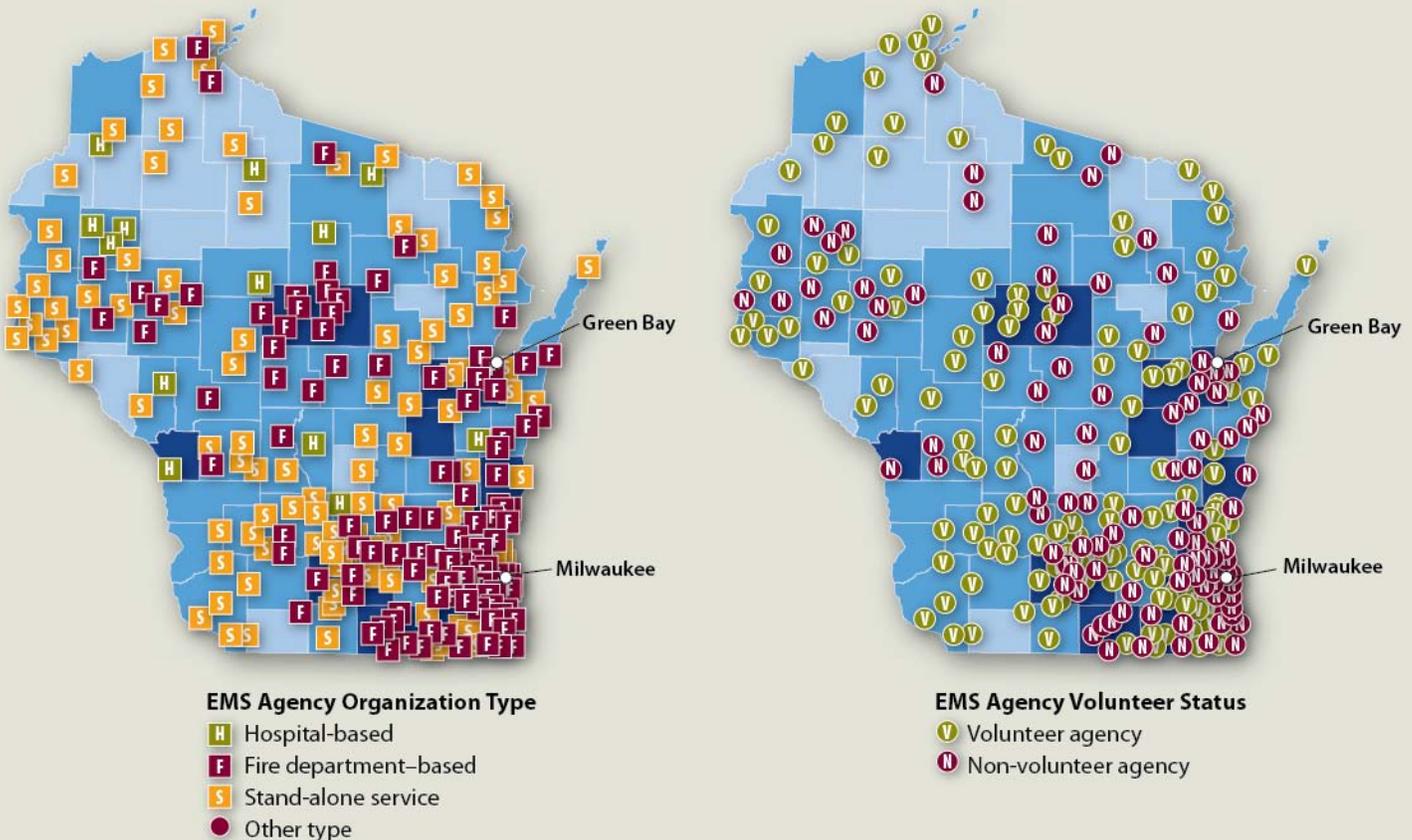


County total population categories represent the lowest, middle three, and highest quintiles, respectively.

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

Interventions	Wisconsin			All 9 States		
	EMT-Basic (%)	EMT-Intermediate (%)	EMT-Paramedic (%)	EMT-Basic (%)	EMT-Intermediate (%)	EMT-Paramedic (%)
Thrombolytic agent	0.0	0.7	17	0.6	1.6	25.1
Morphine or equivalent	0.0	20.9	87.1	0.5	27.7	91.6
Surgical airway	1.3	2.2	74.3	0.6	2.2	78.8
Beta blocker	0.0	2.2	72.3	0.6	5.6	78.2
Anti-arrhythmic medication	0.0	15.1	87.1	0.7	24.0	93.2
Pressor agent	0.4	6.5	78.0	0.8	9.9	86.3
Central IV	0.0	8.0	35.6	1.0	15.2	35.0
Endotracheal intubation	5.3	25.9	87.1	8.7	41.0	95.4
Peripheral IV	3.5	93.5	94.1	9.2	93.3	97.1
Nitroglycerin from EMT supply	18.1	88.5	93.1	15.5	56.4	95.0
12-lead ECG	44.3	67.6	92.1	22.8	36.7	88.2
Monitor end-tidal CO2	21.3	36.0	87.1	26.4	45.0	90.2
Aspirin (ASA) from EMT supply	85.8	100.0	98.0	63.7	80.8	98.1
Alternate mechanical airway	97.8	98.6	96.0	66.7	91.9	97.0
Glucometry	96.0	99.3	95.1	83.9	95.3	98.2
Assistance with patient's nitroglycerin	93.4	92.8	87.1	86.7	91.6	93.1
Assistance with patient's aspirin	94.7	96.4	92.1	87.6	91.6	94.0
Pulse oximetry	95.1	98.6	95.1	93.8	98.0	99.1

\* Source: Survey of EMS Practices for Heart Disease and Stroke, 2008. In Wisconsin, 244 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.

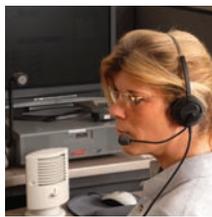


\* EMS agency is represented at the centroid of the ZIP code in which it is located. In ZIP codes where multiple agencies responded to the survey, agencies are slightly offset from the centroid. All EMS agencies in the state are not represented on this map. Only EMS agencies that responded to the survey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

## EMS Agency Characteristics That Are Important for Cardiovascular Emergency Response\*

		Wisconsin		All 9 States	
Number of Agencies that Responded to Survey		244		1,292	
		Count	(%)	Count	(%)
<b>Location</b>	Rural	126	51.6	665	51.5
	Urban	118	48.4	627	48.5
<b>Organization Type</b>	Fire based	122	50.0	756	58.5
	Non-fire based	122	50.0	536	41.5
<b>Volunteer Status</b>	Volunteer	133	54.5	545	42.4
	Non-volunteer	111	45.5	672	55.2
<b>Medical Director Involvement</b>	Full-time	89	36.6	520	40.9
	Part-time	52	21.4	354	27.8
	Volunteer	102	42.0	383	30.1
	No medical director	0		15	1.2
	Involvement in past 4 weeks	127	52.5	633	50.4
<b>Communication Center</b>	Prioritizes dispatching	104	43.9	678	54.2
	Provides caller with CPR instructions	154	66.4	861	69.5
	Uses automatic vehicle location technology	40	16.7	210	16.6
<b>Highest EMS Level of Life Support</b>	Basic life support	65	26.8	187	15.6
	Intermediate life support	60	24.7	187	15.6
	Advanced life support	118	48.6	828	68.9
<b>Online Immediate Access to Medical Consultation</b>	Always, 24 hours a day, 7 days a week	234	95.9	1,155	90.3
	Sometimes, less than 24 hours a day	8	3.3	88	6.9
	Never	2	0.8	36	2.8
<b>Provides On-Scene Time Benchmark</b>	Chest pain or suspected heart attack	191	79.3	1,045	82.0
	≤ 15 min	170	89.0	914	87.7
	> 15 min	21	11.0	128	12.3
	Cardiac arrest	170	70.5	969	76.1
	≤ 15 min	147	86.5	806	83.4
	> 15 min	23	13.5	160	16.6
	Stroke	192	79.7	1,037	81.4
	≤ 15 min	173	90.1	921	89.1
> 15 min	19	9.9	113	10.9	
<b>Uses Stroke Scale for Diagnosing Stroke</b>		187	77.9	1,018	80.3
<b>Patient Information to Receiving Hospital in Advance of Arrival</b>	Yes	241	99.6	1,158	96.3
	No	1	0.4	45	3.7
<b>New Therapy or Technology Adopted for Stroke in the Past Year</b>					
Most common therapies/technologies reported (if specified):					
Immediate transport to specialized stroke center if accessible		19	21.8	399	31.4
Pre-arrival alert of stroke team at hospital					
Adopted new stroke scale					
<b>Funding Basis</b>	Private for-profit	13	5.4	102	8.0
	Private not-for-profit	52	21.4	184	14.4
	Public/government	170	70.0	933	72.8
	Public-private partnership	9	3.7	62	4.8
<b>System Capabilities</b>	Basic 9-1-1 system	35	14.5	160	12.6
	Enhanced 9-1-1 system	206	85.5	1,073	84.2
	Other	0		41	3.2

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**Publication date:** 4/5/2011