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Short Communication

Automated external defibrillator prevalence among the municipal police agencies of New Jersey: how regional differences affect national data

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Introduction

As sudden cardiac death continues to be among the nation's leading causes of mortality,[1] interventions aimed at treatment of out-of-hospital cardiac arrest (OHCA) have been studied extensively. Recent investigations have examined intravenous drug administration[2] and institution of the advanced cardiac life support algorithm,[3] but the only therapy that has been repeatedly proven effective is early defibrillation with a manual or automatic external defibrillator (AED).[3] In particular, the use of AEDs by law enforcement personnel has been shown to reduce time to defibrillation by an average of 4 min[4,5] and improve absolute survival rates by up to 8.2% for patients presenting in ventricular tachycardia or ventricular fibrillation.[5]

According to the 2006 study conducted by Hawkins et al., the national prevalence of AEDs is 31.0% (95% CI: 27–36%).[6] However, Fig. 1 may be misleading, as prevalence rates vary by geography from 10.6% in self-reported 'urban' areas to as high as 53.8% in self-reported 'suburban' locales. Since a significant source of funding for public access AEDs originates from both federal and national private grants, it is important to develop an accurate assessment of the prevalence of defibrillators throughout the United States. We hypothesized that state-specific legislation and regional cultural differences alter the real distribution of AEDs across the country. The objective of our investigation was to determine the prevalence of defibrillators among the municipal police departments in New Jersey and to compare the prevalence of AEDs in New Jersey to national estimates.

Results

Of 566 municipalities in New Jersey, 134 were randomly selected, of which 120 (89.6%) completed the survey. Randomization was accomplished via arbitrary simple selection from a listed frame. The selected municipalities represented 15 (71.4%) of the 21 counties in New Jersey. The mean department size was 40.8 (95% CI: 27.3–54.2; Range: 5–777) officers and averaged 15.3 (95% CI: 11.2–19.4; Range: 3–220) patrol vehicles per municipality. A majority of surveys (67.5%) were answered by a sergeant or administrative sergeant with knowledge of department operations, with 32.5% of surveys completed by officers including medical programs officers, training officers, public information officers, and chiefs of police. Most communities (65.8%) were described as 'suburban' by the survey respondents. The majority (75.8%) of agencies reported a response time of less than 4 min, with

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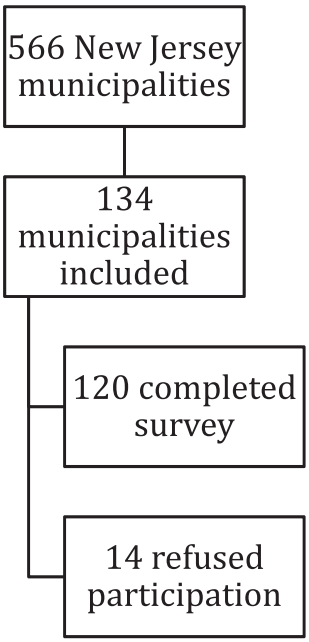

Fig. 1 – Flow diagram of inclusion and response rates of police municipalities.

only 1.7% of departments reporting a response time of greater than 8 min.

Every department reported 100% officer training in CPR (Table 2). Percentage of officers with training in the use of an AED was slightly lower. Of the agencies surveyed, 98.3% reported some amount of AED training, with 96.6% of those departments reporting universal officer AED training. Of the remaining departments that answered 'yes' for training officers in the use of AEDs, 0.85% each reported training 75–99%, 50–74%, and 25–49% of their officers, respectively. The reason for disparity between CPR and AED training was unclear. Additionally, the frequency of re-training or skills currency was not reported.

The majority (67.7%) of departments surveyed indicated they had never received state or federal funding to assist in the purchase of AEDs. Over half (65.8%) of agencies reported arriving to medical emergencies prior to EMS greater than 75% of the time, and 80.0% of departments indicated that an officer from the department had performed cardiopulmonary resuscitation within the past year. Finally, 72.5% of municipal agencies reported that a patrol vehicle AED had been used to administer a defibrillating shock within the past year. Nearly all of the agencies equipped their departments' vehicles with automated external defibrillators, 95% (95% CI: 90.9–99.1%), which is significantly higher than the 31.0% (95% CI: 27–36%) national prevalence rate noted in the most recent study. New Jersey AED prevalence and usage data are presented in Table 1.

Table 1 – Municipal police agency demographic data.

Survey question	Responses (%) (n = 120)
What is your role in the municipal police department?	
AED/Medical programs officer	9 (7.5)
Training officer	3 (2.5)
Public information officer	9 (7.5)
Chief of police	9 (7.5)
Administrative sergeant	40 (33.3)
Patrol officer	21 (17.5)
Other	29 (24.2)
Number of law enforcement officers (mean, [range])	40.8 [5–777]
Number of patrol vehicles (mean, [range])	15.3 [3–220]
Per capita income (mean, [range]) [$]	39,036 [17,400–86,812]
Population (mean, [range])	18,284 [606–24,7597]
How would you characterize your community/jurisdiction?	
Urban	17 (14.2)
Suburban	79 (65.8)
Rural	24 (20.0)
What is your department's average response time?	
<4 min	91 (75.8)
4–8 min	27 (22.5)
>8 min	2 (1.7)
What type of EMS system services your community?	
Volunteer	54 (45.0)
Paid	42 (35.0)
Hybrid	21 (17.5)
Unknown/Other	3 (2.5)

Table 2 – Municipal police agency CPR/AED training.

Survey question	Responses (%) (n = 120)
Are your officers trained in the use of AEDs?	
Yes	118 (98.3)
No	2 (1.7)
What percentage of your officers is trained in AED use?	
100%	114 (95.8)
75–99%	1 (0.8)
50–74%	1 (0.8)
25–49%	1 (0.8)
1–24%	0 (0)
Are your officers trained in cardio-pulmonary resuscitation (CPR)?	
Yes	120 (100)
No	0 (0)
What percentage of your officers is trained in CPR?	
100%	120 (100)
75–99%	0 (0)
50–74%	0 (0)
25–49%	0 (0)
1–24%	0 (0)

Discussion

Our study demonstrated an exceptional rate of AED prevalence among the municipal police departments of New Jersey, to the extent that correlation of demographics that would render an agency more likely to equip their vehicles with defibrillators was unnecessary. With 95% of municipal police departments reporting AEDs in their vehicles, 78.3% of which have at least half of their departments' vehicles equipped with AEDs, such nearly-universal supply of AEDs among municipal police departments was encouraging to the authors. The impact of police department AEDs to patient outcome can be significant, as 93.4% of participating police departments reported that police