



THE CITY OF NEW YORK

DEPARTMENT OF HEALTH AND MENTAL HYGIENE

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2007 Report to City Council on Local Law 20: Public Access Defibrillator Use In New York City

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**Prepared by the
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Bureau of Chronic Disease Prevention and Control
Cardiovascular Disease Prevention and Control Program**

Executive Summary

In March 2005, the New York City Council enacted Local Law 20 (LL20) requiring the placement of Automated External Defibrillators (AEDs) in specific public places. This report outlines the locations and quantities of AEDs in New York City (NYC) required by LL20, as well as other registered AEDs, and looks closely at city agency compliance with the provisions of the law. All city agencies mandated under the law, including Department for the Aging, Department of Citywide Administrative Services, Department of Parks and Recreation, and Department of Transportation, are in full compliance with the law.

New York State Law requires that all AEDs in NYC be registered with the Regional Emergency Medical Services Council of New York City, Inc. (REMSCO). However, registration of devices and reporting of AED use appears to be inconsistent across different types of facilities, thus data completeness is not assured. REMSCO reports that 4257 public access defibrillators (PADs) are registered in the database, up from 1941 registrations last year. This large increase is due in part to compliance with the registration provisions in NYS law by city agencies mandated under LL20 and by the Department of Education.

There were 182 documented AED uses reported to REMSCO for the period of June 1, 2006 through May 31, 2007. During the period June 1, 2006 through May 31, 2007, there were a total of 6140 out-of-hospital cardiac arrests reported in New York City by the Fire Department of New York (FDNY). While acknowledging gaps in the existing data, they show that survival from out-of-hospital cardiac arrests in NYC associated with the use of AEDs prior to EMS arrival is small, not greater than 0.6 percent (based on REMSCO data on return of spontaneous circulation following AED use) of all out-of-hospital cardiac arrests.

It is well documented that AEDs placed in high traffic areas (e.g.: airports, other transportation hubs) and in places where people who are at a high risk for sudden cardiac arrest live or congregate (e.g.: nursing homes, senior centers) have a higher likelihood of saving lives.^{1,2,3,4,5,6} AEDs are already in use by FDNY, the New York City Police Department (NYPD), Port Authority Police Department (PAPD) and in other private settings. FDNY maintains AEDs on all fire engines, NYPD utilizes AEDs within many of its units, and PAPD maintains AEDs at the airports, with some patrol units and at some PATH train hubs.

Most cardiac arrests are due to underlying causes that evolve over years and can be prevented and treated prior to the onset of cardiac arrest. Addressing smoking, obesity, physical inactivity, high blood pressure and elevated cholesterol effectively as a City will have the greatest impact on reducing cardiac deaths.

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Attachments:

- Local Law 20, 2005
- NYC DOHMH Rule Implementing Section 17-188 of the Administrative Code Requiring Placement of Automated External Defibrillators in Certain Public Places
- *Report to City Council on Local Law 20: Public Access Defibrillators in New York City, July 7, 2006.*

1.0 Introduction

In March 2005, the New York City Council enacted Local Law 20 (LL20) requiring the placement of Automated External Defibrillators (AEDs) in specific public places. LL20 also mandated that the New York City Department of Health and Mental Hygiene (DOHMH) provide a report on the registration and placement of AEDs following the first year of enactment. After the first year's report, DOHMH is required to report on placement and registration for each of the four years following. Now at the completion of year two of LL20's enactment, and in accordance with this mandate, we submit this report indicating the quantities and locations of AEDs in public places as required by LL20.

LL20 and the DOHMH rules state that any AED be acquired, possessed and operated in accordance with New York State Public Health Law §3000-b, which requires registration of the devices with the Regional Emergency Medical Services Council of New York City, Inc. (REMSCO) before they can be used by non-health care professionals. Although not mandated by LL20 reporting requirement, the limited available data from REMSCO and the Fire Department of New York (FDNY) on AED uses and outcomes is also reported here in an attempt to assess the effectiveness of this law. For those readers becoming newly acquainted with LL20, we refer you to the original legislation, the DOHMH regulation and the submitted, *Report to City Council on Local Law 20: Public Access Defibrillators in New York City*, July 7, 2006.

These regulations only govern Public Access Defibrillation (PAD) provider sites, defined as sites where AEDs are used by non-medical personnel. They do not cover the use of AEDs as part of medical response by emergency medical systems (EMS) personnel, including emergency medical technicians and paramedics, nor do they govern the use of AEDs in medical facilities that have more advanced levels of medical care. While many patients receive defibrillation from trained EMS personnel, AED use is much less frequent.

For the purposes of this report, AED means a medical device, approved by the United States Food and Drug Administration, that:

1. is capable of recognizing the presence or absence, in a patient, of ventricular fibrillation and rapid ventricular tachycardia;
2. is capable of determining, without intervention by an operator, whether defibrillation should be performed on the patient;
3. upon determining that defibrillation should be performed, automatically charges and requests delivery of an electrical impulse to the patient's heart; and
4. then, upon action by an operator, delivers an appropriate electrical impulse to the patient's heart to perform defibrillation.

The AED may also be referred to as a PAD. This is to denote that the AED is being used by a non-911 medical provider such as a security guard or other lay rescuer.

See attachments:

- Local Law 20, 2005
- NYC DOHMH Rule Implementing Section 17-188 of the Administrative Code Requiring Placement of Automated External Defibrillators in Certain Public Places
- *Report to City Council on Local Law 20: Public Access Defibrillators in New York City*, July 7, 2006.

2.0 Inquiries from the Public

2.1 311 Activity

Inquiries to the City's 311 helpline about "AEDs" or "defibrillators" are addressed by providing information regarding available training centers and/or callers are directed to the DOHMH's Cardiovascular Disease Prevention and Control Program (CVD) for more information.

Complaints and Inquiries through the 311 System

For the period June 1, 2006 through April 31, 2007, (May 2007 data are not yet available), 311 received 1418 calls requesting information on CPR and/or AED training. Requests for information on CPR/AED training have been consistent over the past year and demonstrate a large public interest in this type of training.

<u>Date</u>	<u>CPR or Defibrillator Training</u>	<u>Inquiries or Complaints</u>
Jun-06	148	2
Jul-06	135	4
Aug-06	171	0
Sep-06	114	5
Oct-06	130	4
Nov-06	103	4
Dec-06	83	0
Jan-06	122	0
Feb-06	134	2
Mar-06	151	3
Apr-06	125	0
<u>Period Totals</u>	<u>1418</u>	<u>24</u>

During this same period, 311 received 24 inquiries about LL20 including three complaints which were routed to the CVD program. All of these complaints were regarding health club facilities not regulated by LL20 and were referred to the New York State Attorney General's Office. Information was also sent to the facility in question detailing the New York State law and their obligations under it.

3.0 PAD Locations

3.1 Data Sources

AED placement and use data in this report comes from the following sources:

The Fire Department of New York (FDNY) Division of Emergency Medical Services (EMS), Office of Medical Affairs - This office maintains records on all patients entered into the municipal 911-EMS system. Data on specific parameters were made available for this report. FDNY intends to incorporate PAD location data into their emergency 911 dispatch systems so dispatchers may alert unaware callers of their availability as appropriate but have yet to integrate this information into their system.

The Regional Emergency Medical Services Council of New York City, Inc. (REMSCO) - REMSCO is designated by New York State law to track all registered AEDs within New York City and to maintain records on all AED use. DOHMH has provided funding to refine REMSCO tracking systems to streamline registration and improve reporting accuracy.

3.2 Data Limitations

Limited conclusions can be drawn from these data due to the nature of the information collected. There is no way to determine if all AEDs required to be registered with REMSCO have been. Initial contact with PAD providers found a general lack of awareness of this obligation.

In addition, REMSCO data only reports if there is spontaneous circulation following AED use, but provides no further information on individual outcome (survival to discharge from the hospital). Information provided to REMSCO, including details of the circumstances of AED use, is often incomplete, leading us to believe that these data do not capture all of the AED uses in New York City. Therefore there may have been AED uses leading to survivals that are not captured in this report.

3.3 PAD Locations

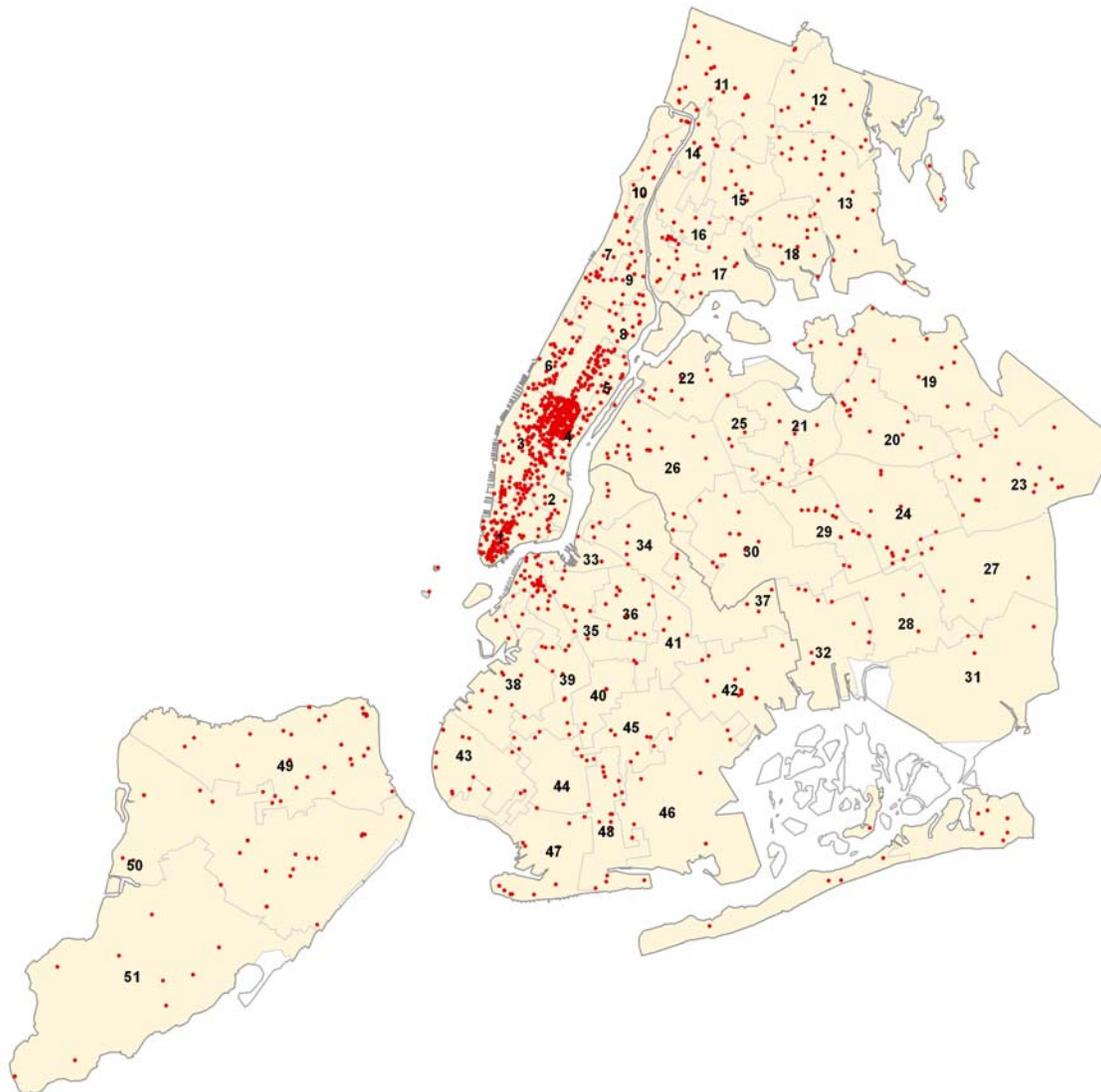
REMSCO data shows that 4701 AEDs are registered throughout the five boroughs. In the last reporting period a year ago, 1941 AEDs were registered with REMSCO. This sizable increase is due to LL20-mandated city agencies registering their AEDs as well as the 2400 devices that the Department of Education registered this year.

3.3.1 Map of PAD Locations

The following map displays all registered AED locations in NYC. Boundaries drawn on the map represent the council districts and each red dot represents a PAD site. Multiple AEDs may exist in one location. Registered AED sites are concentrated in Manhattan.



Public Access Defibrillation Sites in New York City



Note: This represents only PAD sites and does not include AEDs used by medical personnel in an official emergency response capacity. This also does not include AEDs maintained by the Department of Education.

3.3.2 Non-Government Locations

Following is a description, by type of location, of the number of non-government PAD facilities that are registered with REMSCO.

Nursing Homes

Nursing homes that already provide advanced life support, which includes use of a manual or automated defibrillator and trained physicians, registered nurses or emergency medical technicians present on-site 24 hours a day, seven days a week, are exempt from these regulations. However, those nursing homes that do not have a manual defibrillator or AED are required to obtain an AED and to have at least two staff members trained in the use of an AED on premises at all times. Of the 181 nursing homes in the city⁷, 43 are registered and have a total of 101 AEDs.

Stadia and Arenas

There are at least 21 stadia and arenas in the city which would be subject to LL20 but few have AEDs registered with REMSCO. DOHMH polled several of these facilities for this report and all of the facilities contacted reported offering a higher level of medical care, either providing full-time clinical services staffed by medical personnel or private EMS on a stand-by basis, during events held at each respective stadium.

Private Golf Courses

The two private golf courses were contacted and both have registered AEDs.

3.3.3 City Agency AED Placement

Following is a review of the status of AED placements by city agencies covered under LL20.

Department for the Aging

Prior to LL20, the Department for the Aging (DFTA) possessed 84 AEDs which were given to them by the NYC Office of Emergency Management (OEM). To become compliant with LL20, DFTA purchased an additional 238 devices for placement in senior centers serving meals and operating a minimum of three days per week. This brings their total to 316 devices. All DFTA AEDs are appropriately registered in accordance with New York State Law.

New York City Housing Authority

DOHMH has recently learned that of some senior centers located in New York City Housing Authority (NYCHA) facilities may also fall under LL20 jurisdiction (providing they serve meals and operate more than three days per week). DOHMH is working with DFTA and NYCHA to further clarify the status of these senior centers regarding compliance with this law.

Department of Parks and Recreation, including Public Golf Courses

As outlined in LL20, the Department of Parks and Recreation (Parks) is required to identify six parks in each borough where devices should be placed. Parks actually

identified a minimum of ten facilities in each borough. These placements fulfill the provisions as outlined in LL20. Public golf courses are required to have AEDs, and all eleven of the golf courses within the Parks system have AEDs in place and are included in these numbers. All Parks AEDs are appropriately registered in accordance with New York State Law.

Borough	Parks Facilities Identified	Number of AEDs in Parks System
Bronx	10	10
Brooklyn	12	12
Manhattan	19	20
Queens	10	10
Staten Island	13	13

Data Source: NYC Parks Department, 2007

Department of Citywide Administrative Services

The Department of Citywide Administrative Services, Division of Facilities Management and Construction (DCAS) has a total of 112 PADs placed throughout its facilities. DCAS has a minimum of 10-12 people trained for every AED they have placed.

Borough	Number of DCAS Buildings with AEDs	Total Number of AEDs in DCAS System
Bronx	6	13
Brooklyn	11	21
Manhattan	22	51
Queens	7	15
Staten Island	7	12

Data Source: NYC Department of Citywide Administrative Services, 2007

All DCAS AEDs are appropriately registered in accordance with New York State Law.

Department of Transportation

Ferry terminals owned and operated by the Department of Transportation (DOT) with a passenger capacity of ≥ 1000 are also subject to LL20. The two facilities under DOT jurisdiction that fit this criteria are the South Ferry Terminal in Battery Park and the St. George Terminal on Staten Island. Both of these facilities have AEDs as required.

Although not required by LL20, DOT also placed AEDs on all of the ferry vessels. All AEDs owned by DOT are appropriately registered in accordance with New York State Law.

4.0 PAD Uses

4.1 FDNY EMS Data on Out of Hospital Cardiac Arrests

The following chart displays the number of out-of-hospital cardiac arrests occurring during the 11 month period of June 1, 2006 through April 31, 2007 by borough. Emergency medical personnel, in consultation with an online medical control physician and in accordance with practice protocols, may pronounce a patient deceased on the scene. In this case, transportation will not be provided by EMS. Of note, 38 percent (2345/6140) of all out-of-hospital cardiac arrests were not transported by EMS.

Out of Hospital Cardiac Arrests Responses by FDNY			
Borough	Transported	Not Transported (Deceased on Scene)	Borough Totals
Brooklyn	1129	802	1931
Bronx	723	516	1239
Manhattan	825	368	1193
Queens	908	513	1421
Staten Island	210	146	356
Totals	3795	2345	
Total Cardiac Arrests		6140	

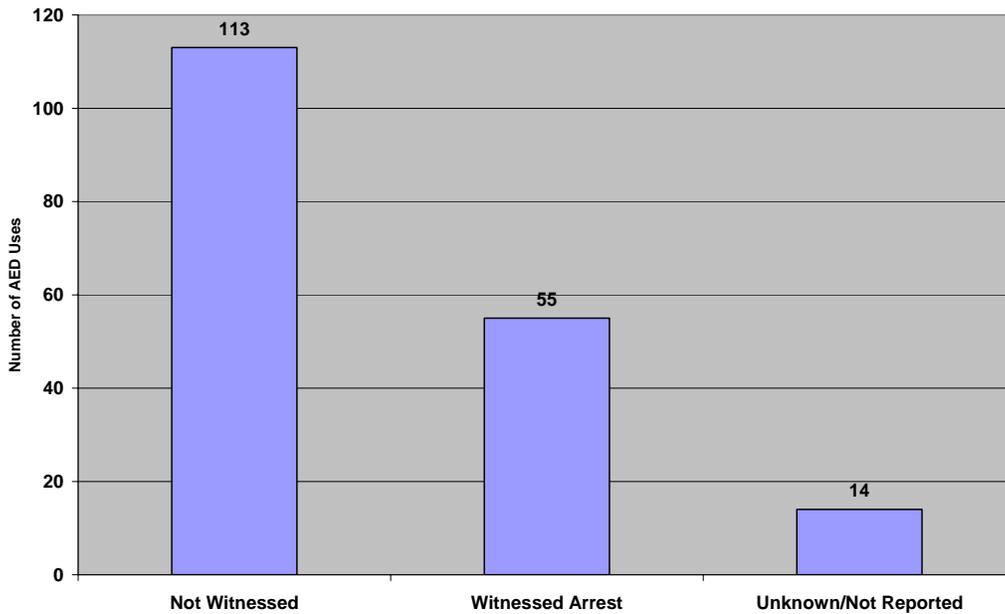
911-EMS Data from 6/1/2006-4/31/2007

Data Source: Fire Department of New York, Office of Medical Affairs, 2007

4.2 REMSCO Data on Witnessed Arrests

AEDs are most effective if used within several minutes of a cardiac arrest.⁸ Therefore having an event witnessed offers the greatest likelihood for immediate lifesaving action. In 113 out of 182 (62 percent) AED uses, the actual arrests were not witnessed. In 55 of 182 (30 percent) AED uses, the arrests were witnessed by either a bystander or a CPR/AED trained lay-responder who then utilized the AED.

The Majority of AED Use Cardiac Arrests Were Not Witnessed

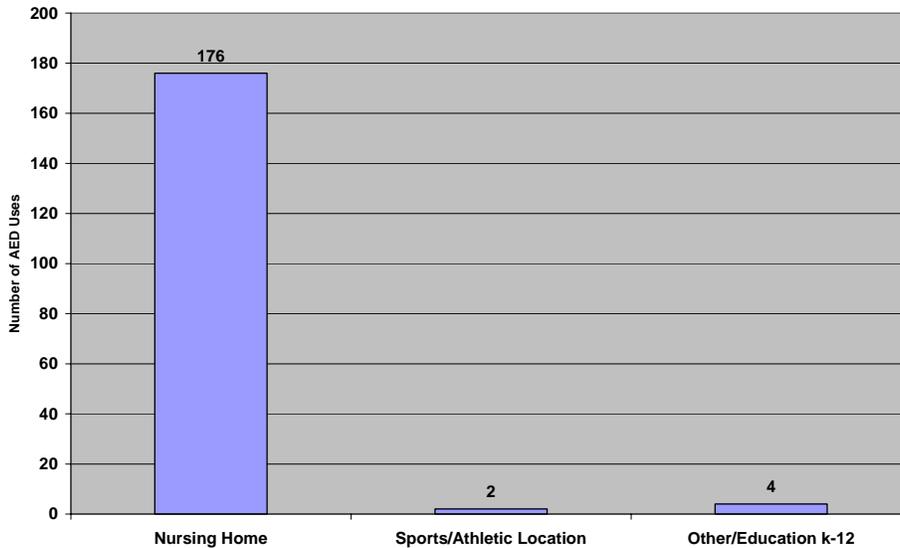


Data Source: Regional EMS Council of New York City, 2007

4.3 REMSCO Reported PAD Use in New York City

According to available data on registration and use of devices, AED uses were reported primarily by nursing homes during this period as well as in the prior reporting year (Includes both LL20 required AED sites and all others reported to REMSCO).

AED Uses by Location

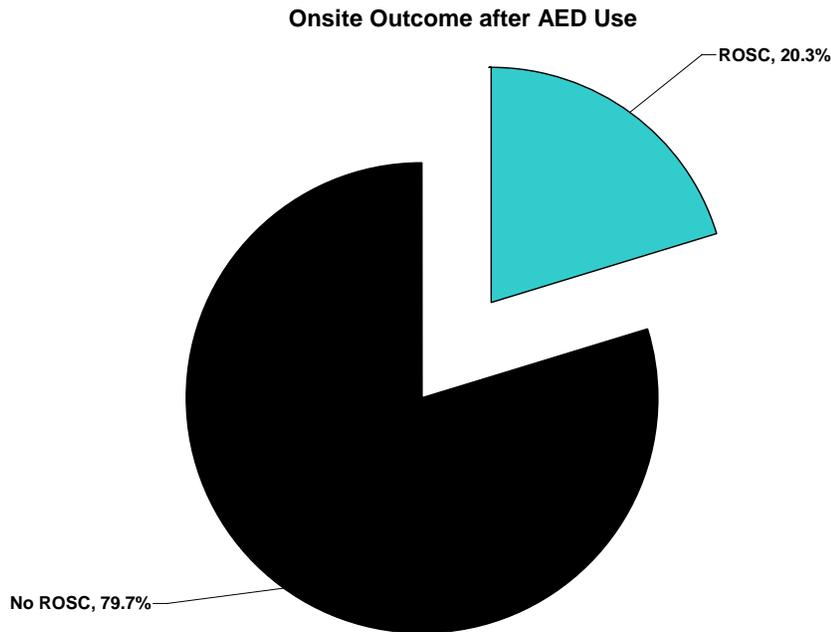


Data Source: Regional EMS Council of New York City, 2007

While the largest reported user of AEDs in the REMSCO data is nursing homes, no survivors were identified from these AED uses by FDNY.

4.4 REMSCO Data on Return of Spontaneous Circulation

REMSCO PAD use data reports on ‘return of spontaneous circulation’ (ROSC), defined as a return of a pulse when it had been reported as absent prior to AED use. ROSC related outcomes reported here are categorized as follows: ‘Return of Spontaneous Circulation’ (ROSC), ‘No ROSC’ and ‘unknown’.



Data Source: Regional EMS Council of New York City, 2007

According to REMSCO data, 37 of the 182 (20 percent) uses were associated with a return of spontaneous circulation (ROSC), an estimate for the upper limit number of survivors from out of hospital cardiac arrest. REMSCO does not follow-up on outcomes for ROSC cases. Therefore we can only conclude the absolute maximum number of survivors associated with AED use is 37. The FDNY data show that one of these survivals is a result of an AED use in a location mandated by LL20. This use was in a New York State Court building with an organized response system consisting of police officers, however we are unable to ascertain whether this AED was in place prior to or as result of LL20.

4.5 Survival to Hospital Discharge

While the following reported data are quite limited, we include them in this report for descriptive purposes and to monitor data quality from all sources. FDNY collects individual outcome data following PAD use only when resulting in ROSC.

Location and Outcome of Patients with ROSC following PAD Use

Type of Location	All Outcomes	<i>Discharged from Hospital</i>	<i>Admitted</i>
Health Club/Gym	1	1	
Educational	1		1
Government Office	1	1	
Totals	3	2	1

911-EMS Data from 6/1/2006-4/31/2007

Data Source: Fire Department of New York, Office of Medical Affairs, 2007

As shown in the chart, 3 out of the 6140 total out-of-hospital cardiac arrests in New York City from June 1, 2006 through April 31, 2007 were associated with PAD usage and resulted in 'survival' (defined here as "discharged" "transferred" or "admitted to the hospital") by FDNY report. One of these uses resulting in 'survival' occurred at a DCAS-run building, required by LL20 to have an AED. The two other survivals occurred in health clubs, not required due to existing New York State law. Of note, 2 of these 3 uses were not reported in the REMSCO use data.

We recognize that inconsistencies exist among the data sources used in this report. We are currently working with REMSCO to refine the data collection system and to devise ways to increase registration of AEDs and accurate reporting of use.

5.0 Conclusions

LL20 mandated wide placement of AEDs by both public and private entities. To date, registration of required AEDs does not appear to have been universal and therefore the subsequent data available is likely incomplete. City agencies specified in LL20, DCAS, DFTA, Parks and DOT, are now in full compliance with all of the provisions. However we suspect that data on the location and placement of AEDs in privately owned and operated entities remains incomplete, since in our initial contact with many city agencies, they were unaware of the registration component of the law. While we believe that the process of registration is now easier and more streamlined with the addition of the web-based registration system, it is too early to determine if the online system is a barrier to reporting or an improvement in the reporting system. The online registration system does allow for easier capture and organization of the data and has, thereby, streamlined access to data used in this report. We recognize that inconsistencies exist between the two data sources used in this report as demonstrated by the reported uses in the FDNY data not captured by the REMSCO data. DOHMH will continue to work with REMSCO to develop and refine the reporting system and devise methods for increasing registration of AEDs.

While these data sources have not allowed a comprehensive assessment of the impact of LL20 on NYC out-of-hospital sudden cardiac arrest survival rates, we believe that some conclusions can be drawn. As mentioned in section 4.4, FDNY reported that 3 of the 6140 total out-of-hospital cardiac arrests in NYC were associated with PAD usage *and* resulted in ‘survival’. Two of these survivals were at health clubs and the third at a New York State Court building, run by DCAS.

There were 176 AED uses (97 percent of all reported uses) in nursing homes, indicating that LL20 may fill a treatment and medical care gap at these sites. However, none of these uses resulted in survival, according to FDNY data.

It is well documented that AEDs placed in high traffic areas (e.g.: airports, other transportation hubs) and in places where people who are at a high risk for sudden cardiac arrest live or congregate (e.g.: nursing homes, senior centers) have a higher likelihood of saving lives.^{9,10,11,12,13,14} AEDs are already in use by FDNY, NYPD, Port Authority Police Department (PAPD) and in other private settings. FDNY maintains AEDs on all fire engines, NYPD utilizes AEDs within many of its units, and PAPD maintains AEDs at the airports, with some patrol units and at some PATH train hubs.

As expected voluntary AED placements have continued to expand. DOHMH does not recommend any further expansion of mandated AED placement at this time.

Public health interventions take on many forms and include on-going evidence-based initiatives designed to significantly decrease cardiovascular disease related death and illness. There was one AED associated save in a LL20 mandated facility, but it is unclear whether the site had an AED prior to or in response to LL20. We have no evidence that implementation of LL20 has had an impact in its second year. The AEDs in nursing

homes, while not associated with documented lives saved, were used and are likely to prove an appropriate measure.

Most cardiac arrests are due to underlying causes that evolve over years and can be prevented and treated prior to the onset of cardiac arrest. Addressing smoking, obesity, physical inactivity, high blood pressure and elevated cholesterol effectively as a City will have the greatest impact on reducing cardiac deaths.

6.0 References

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- ⁵ Page RL, Joglar JA, Kowal RC et al. Use of automated external defibrillators by a U.S. airline. *N Engl J Med* October 26 2000;343(17):1210-6.
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