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## Singapore – Community Training

# Residential Public Access Defibrillation Program in Singapore

## BRIEF BACKGROUND

In most EMS systems, the rates of early defibrillation remain low. In Singapore, bystander AED defibrillation rates were only 1.8% in 2011, and PAD usage rates in residential areas were even lower at 0.4%. This issue was compounded by the fact that PADs were not legislated for location reporting or maintenance.

Training and equipping professional first responders to arrive in four minutes is operationally and logistically challenging for most EMS systems to achieve. PAD programs have proliferated as an adjunct to reduce the time to defibrillation. Singapore used a data-based approach to leverage a highly-urbanized living environment to pioneer a residential PAD program and AED registry to help raise survival rates.

## STEPS TAKEN

The SCDF engaged the Singapore Heart Foundation (SHF) to start a community-based AED registry and develop PAD program educational materials for building managers — including AED-related topics in their public outreach programs — and develop AED mapping/registration operations by visiting the PAD sites annually. Using the data from the registry, SCDF advocated for a residential PAD leasing program to install 5,000 AEDs to cover 10,000 public housing blocks — approximately 82% of the local population. The PADs were installed in phases from 2015 to 2019.

PAD data is regularly updated to the 995 dispatch center and the myReponder crowdsourcing app to increase PAD use. Additional PAD data collection confirmed that only 0.4% of OHCA at residential areas receive bystander AED usage.

Location with bystander AED	Frequency	%	Total OHCA	% OHCA
Healthcare Facility	82	21	400	20.5
Home Residence	30	7.7	8942	0.4
Industrial Place	20	5.1	301	6.6
Nursing Home	37	9.5	451	8.2
Other (Air base, army camps etc)	21	5.4	554	3.8
Place of Recreation	83	21.3	247	33.6
Public/Commercial Building	81	20.8	954	8.5
Street/Highway	5	1.3	567	0.9
Transport center	31	7.9	124	25.0
Total	390	100	12540	100

## CHALLENGES

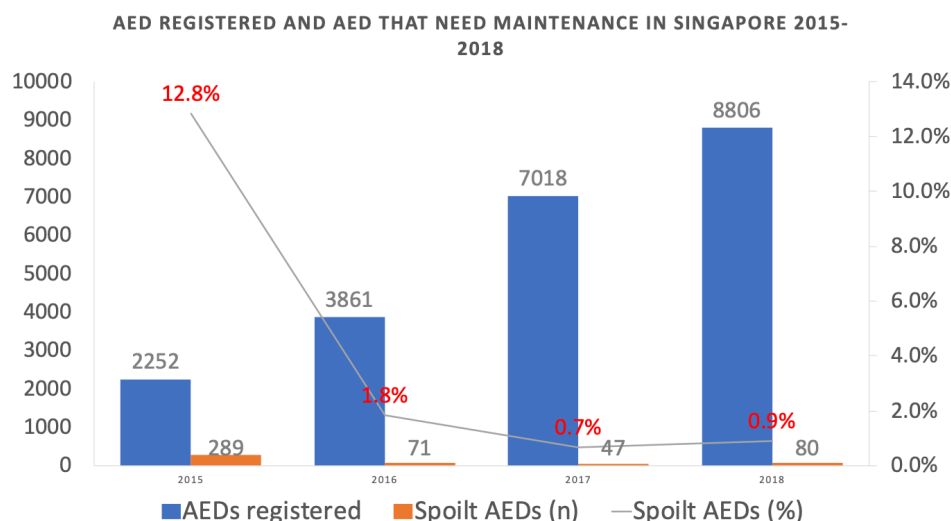
Even with the improved accessibility of PADs, only one third of the layperson population was CPR/AED-trained. Also, while 79% of the population recognized AED signage, only 35% believed that anyone was permitted to use an AED.

## RESULTS

The AED leasing program proved to be transformative for the management of AEDs in Singapore:

1. It reduced the high capital cost of purchase to a much lower annual cost spread over six years.
2. It contractually provided comprehensive annual maintenance and insurance against an estimated 5% chance of any particular AED being activated. The small increase in cost per AED covers the cost of replacement AEDs, pads and batteries after an AED activation.
3. During restoration of the PAD, operational data was downloaded and sent to the OHCA registry.

With the registration of PADs, Singapore has reduced the number of faulty AEDs (defined by expired pads, batteries, maintenance or non-function) from 12.8% to 0.9%, and now have 8,806 AEDs in the registry as of December 2018.



Bystander AED usage increased from 1.8% in 2011 to 4.6% in 2016. This is associated with an improved Utstein survival rate from 11.6% in 2011 to 23.4% in 2016. The country expects to see continued rise in residential bystander AED, helping to address the gap in PADs in residential areas.

## OUTLOOK

Singapore is currently rolling out one-hour, hands-only CPR/AED programs at all public schools and community centers. The OHCA registry is concurrently collecting data on population intervention, determining whether the density of AED installation across housing blocks is adequate.

## CONTACT

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