True Public Access Defibrillator Coverage is Overestimated

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**Background:** Out-of-hospital cardiac arrests (OHCAs) occur at all times of the day and night. Immediate access to an AED increases survival. However, most public-location AEDs are placed in buildings without 24 hour access.

**Objective:** To measure fixed-location public AED coverage of OHCAs by time of day and day of week in a Canadian urban setting.

**Methods:** We identified all atraumatic public OHCAs occurring in Toronto, Canada from Jan. 2006 – Aug. 2014. We obtained a list of registered AEDs from Toronto Emergency Medical Services as of March 2015 and determined the hours that each AED was available based on operating hours of the building housing the AED. We counted the number of OHCAs that occurred within 100 m of an AED ("assumed 24/7 coverage") and the number that occurred both within 100 m of an AED and when the AED was available ("actual coverage"). Statistical analysis was performed using a $\chi^2$ test.

**Results:** We identified 2440 atraumatic public OHCAs and 737 registered AED locations. A total of 451 OHCAs were covered under assumed 24/7 coverage. In terms of actual coverage, 354 OHCAs were covered, representing a coverage loss of 25.5%. The figure shows coverage decreased by 8.6% during the day (8am-3:59pm), 28.6% in the evening (4pm-11:59pm), and 48.4% at night (12am-7:59am); the differences were statistically significant ($p<0.001$). During the evenings, nights, and weekends the coverage loss was 31.6%, which is when the majority (66.1%) of the OHCAs occurred. The largest coverage losses were found in schools (39.7%), industrial facilities (39.3%), recreation facilities (37.1%), and offices (35.7%). Transportation facilities, long term care homes and homeless shelters had no coverage loss.

**Conclusion:** One out of every four OHCAs in proximity of an AED occurs when that AED is inaccessible due to lack of 24/7 access. When deciding on candidate locations for placement of AEDs, temporal access should be considered to maximize the number of lives saved.
Disclosure:

C.L. Sun: None. D. Demirtaş: None. S.C. Brooks: Other; Modest; Travel reimbursement from the PulsePoint Foundation. L.J. Morrison: None. T.C. Chan: None.