Out-of-hospital cardiac arrest is a significant public health issue, responsible for more than 300,000 deaths in North America annually. The treatment for cardiac arrest, namely, cardiopulmonary resuscitation (CPR) and defibrillation is very time-sensitive. Public access defibrillation programs, which deploy automated external defibrillators (AEDs) in public areas for bystander use in an emergency, reduce the time to defibrillation and improve survival rates. The success of PAD programs depends on the strategic location of AEDs. In this talk, we present mathematical models to optimize and evaluate the deployment of AEDs in public settings. Our models are motivated by real-world views on AED usage during a cardiac arrest emergency. Computational results using real data from Toronto, Canada show that an optimized approach to AED deployment can substantially outperform existing approaches. Overall, we believe this project scratches the surface of what may be possible at the intersection of operations research and resuscitation science.

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