# MINIMIZING SERVICE TIMES IN A PUBLIC HEALTH EMERGENCY: A LOCATION-ALLOCATION MODEL

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## ABSTRACT

This paper presents a *p-median* facility location model with queuing approximations embedded into it to minimize the total service times in response to a public health emergency. The model determines the optimal locations of a given number of mass dispensing facilities; PODs (Point of Dispensing), from a pre-determined set of possible locations and incorporates staff allocation decisions to optimize the throughput capacity of these facilities. The presented mathematical model is a nonlinear integer programming model and we present a genetic algorithm (GA) to solve the location-allocation problem and determine the optimum staffing at each facility. Our computational results show that convenient locations of these facilities can significantly decrease the total travel time for individuals in a major public health emergency. In addition, we found that demographic information about the population can significantly impact the optimal staffing decisions. The results presented in this paper can help public health decision makers to make better planning and resource allocation decisions in response to a public health crisis.