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**Nathaniel D Bastian\*** ([nathaniel.bastian@us.army.mil](mailto:nathaniel.bastian@us.army.mil)), 187 Columbia Hill Road, Danville, PA 17821. *A Robust, Multi-Criteria Modeling Approach for Optimizing Aeromedical Evacuation Asset Emplacement.*

The U.S. Army's Health Service Support system is designed to maintain a healthy force and to conserve combat strength of deployed soldiers by employing standardized aeromedical evacuation assets and providing a responsive field-sited medical treatment facility for the wounded soldiers evacuated from the battlefield. Since the beginning of Operation Enduring Freedom, military commanders have faced a significant combinatorial challenge integrating limited air evacuation assets into a comprehensive system for the entire combat theatre. This work describes a robust, multi-criteria decision analysis methodology using a scenario-based, stochastic optimization goal programming model that U.S. Army medical planners can use as a strategic and tactical aeromedical evacuation asset planning tool to help bolster and improve the current air evacuation system in Afghanistan. Specifically, this model optimizes over a set of expected scenarios with stochastically-determined casualty locations to emplace the minimum number of helicopters at each medical treatment facility necessary to maximize the coverage of the theatre-wide casualty demand and the probability of meeting that demand, while minimizing the maximal medical treatment facility evacuation site total vulnerability to enemy attack. (Received July 28, 2009)