Medical Planners' Toolkit (MPTk)

Medical Mission Support

Problem and Requirement

Military medical planners and logisticians have lacked a science-based, repeatable, and standardized methodology for predicting the likelihood of injuries and illnesses, for creating casualty estimates and the associated patient streams, and for estimating the requirements relative to theater hospitalization to service that patient stream. These capability gaps undermine planning for medical support that is associated with military operations.

Solution and Product

While no two military contingency operations are identical, they share certain similarities that allow planning for future engagements based on empirical data from past operations. The Naval Health Research Center has developed the Medical Planners' Toolkit (MPTk) to close the capability gap by combining a suite of tools into a single desktop application. MPTk consists of the Patient Condition Occurrence Frequency (PCOF) tool, the Casualty Rate Estimation Tool (CREstT), and the Expeditionary Medicine Requirements Estimator (EMRE). This suite of tools provides planners with an end-to-end solution for medical support planning across the range of military operations, from combat operations to humanitarian assistance.

Approach and Results

The PCOF tool provides 23 range of military operations-spanning baseline probability distributions for illnesses and injuries based on empirical data all expressed in *International Classification of Diseases, 9th Revision* codes. The tool allows the user to adjust these baselines to better fit planned operations and to manage (i.e., store, edit, export, and import) the results.

CREstT provides the capability to emulate the operational plan using a 180-day palette to calculate the battle and nonbattle injuries and illnesses that are expected during military operations. Casualty estimates can be generated for ground combat, ship attacks, fixed facilities, and natural disasters. This functionality is integrated with the PCOF tool, which provides the patient distributions used to develop patient streams. CREstT uses stochastic methods to generate its estimates and can, therefore, provide quantile estimates in addition to mean value estimates.

EMRE estimates operating room, intensive care unit, ward bed, evacuation, and blood product requirements for theater hospitalization based on a given patient load. EMRE can provide these estimates based on a user-specified average daily patient count (in its standalone mode) or it can use the patient streams derived by CREstT. EMRE is fully integrated with both the PCOF tool and CREstT. EMRE uses stochastic processes to enable users to more accurately evaluate risks in medical planning.

Benefits

- Logisticians and medical planners obtain authoritative estimates quickly and efficiently using an integrated, desktop application.
- Results obtained are based on recent empirical data and subject matter expert knowledge.
- All formulas and algorithms are fully documented to assist in verification and validation.

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