Motivated by the extent of stockouts of essential medicines in developing countries, we study the periodic procurement of multiple health products subject to an exogenous fund disbursement schedule. The objective is to minimize expected discounted health costs in the presence of random demand and procurement lead times. Inventory dynamics are affected by two types of product-specific characteristics: fraction of patients in critical condition and availability of alternative distribution channels. We derive a heuristic for the dynamic allocation of funds based on index functions that evaluate the attractiveness of each additional unit of each product in the current period and for the future system state. The index functions quantify the trade-off between the cost of patients in critical conditions in the current period (myopic) and their benefit for future periods (lookahead). The proposed fund allocation algorithm is: optimal and asymptotically optimal under certain conditions; intuitive, easy to implement, and generalizable; incorporates all available problem information. We present numerical results that suggest the algorithm also yields near-optimal fund allocations and outperforms policies such as fixed base-stock, constant order quantity and myopic.

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