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Is slowing evolution a more effective means of managing antimicrobial resistance than enhancing drug development?

The evolution of drug resistance is a serious impediment to the successful control of many microbial diseases. In principle there are two ways in which this problem might be addressed – (i) enhancing the rate at which new drugs are brought to market, and (ii) slowing the rate at which resistance to currently used drugs evolves. We present a modeling approach based on queueing theory that explores how interventions aimed at these two facets of the problem affect the ability of the entire drug supply system to provide service. Analytical and simulation-based results show that, all else equal, slowing the evolution of drug resistance is more effective at ensuring the adequate availability of effective drugs than is enhancing the rate at which new drugs are brought to market.