In response to demand for fast and efficient clinical testing, the use of point-of-care testing (POCT) has become increasingly common in the United States. However, studies of POCT implementation have found that adopting POCT may not always be advantageous relative to centralized laboratory testing. We construct a simulation model of patient flow in an outpatient care setting to evaluate tradeoffs involved in POCT implementation across multiple dimensions, comparing measures of patient outcomes in varying clinical scenarios, testing regimes, and patient conditions. We find that POCT can significantly reduce clinical time for patients, as compared to traditional testing regimes, in settings where clinic and central testing areas are far apart. However, as distance from clinic to central testing area decreased, POCT advantage over central laboratory testing also decreased, in terms of time in the clinical system and estimated subsequent productivity loss. For example, testing for pneumonia resulted in an estimated average of 27.80 (central lab) versus 15.50 (POCT) total lost productive hours in a rural scenario, and an average of 14.92 (central lab) versus 15.50 (POCT) hours in a hospital-based scenario. Our results show that POCT can effectively reduce the average time a patient spends in the system for varying condition profiles and clinical scenarios. However, the number of total lost productive hours, a more holistic measure, is greatly affected by testing quality, where POCT often is at a disadvantage. Thus, it is important to consider factors such as clinical setting, target condition, testing costs, and test quality when selecting appropriate testing regime.

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