Data-driven Approaches to Antibiotic Resistance Policy

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Abstract:
Antibiotic resistance is a key threat to public health. Reducing antibiotic use in the community is a central strategy for controlling and reversing resistance. However, the quantitative relationships between population-level antibiotic use and antibiotic resistance --the amount by which use must be reduced to achieve a targeted reduction in resistance-- remain challenging to detect, measure, and interpret. I show that large antibiotic use and resistance datasets can address fundamental questions about the relationships between antibiotic use and resistance, such as how the distribution --not just the aggregate amount-- of antibiotic use in a population affects resistance. In other cases, however, refined statistical methodology and targeted data collection will be required to develop rational policy for antibiotic resistance.