

Revisiting the restriction of antibiotics

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Antibiotic resistance, and multi-drug resistance, is a major public health threat. A new study publishing in *PLOS Computational Biology* finds conditions where restricting certain antibiotics may increase the frequency of multiple drug resistance.

Uri Obolski and Prof. Lilach Hadany and colleagues used a mathematical model and [electronic medical records](#) data to show that drug restriction may also lead to results opposite of those desired. Restriction might facilitate the spread of resistant pathogens, due to ineffective treatment with antibiotics that have high resistance frequencies.

If bacterial spread between patients is significant, the advantages of deliberately using the restricted antibiotics can outweigh the disadvantages, and lead to fewer instances of bacteria resistant to all available drugs in the long term as well as more effective treatment in the short term. These results have important implications for drug usage strategies and lead to rethinking the optimal ways of minimizing multiple drug resistance.

The study was performed by means of mathematical modeling, relying on data from the literature and from estimates of drug resistance using blood culture results of patients from Rabin Medical Center, Israel. Further clinical investigation, examining cultures of other infections and performing more clinical research will help ascertain and generalize the optimal conditions for drug restriction.

More information: *PLOS Computational Biology*:
[journals.plos.org/ploscompbiol ... journal.pcbi.1004340](https://journals.plos.org/ploscompbiol/article/journal.pcbi.1004340)

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