



[Probabilistic network modelling of the impact of penicillin consumption on spread of pneumococci.](#)

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Abstract: The worldwide increase of resistant *S. pneumoniae* is a growing clinical problem. In several countries, a more restrictive use of penicillin has been promoted in hope of slowing the rates of resistant pneumococci. However, the consequences of such an action on pneumococcal population dynamics are not fully understood. Thus, a network model was constructed to assess the impacts of penicillin consumption and between-strain competition on the spread of penicillin non-susceptible pneumococci. Model simulations suggest that the age distribution for carriage of penicillin non-susceptible pneumococci, in contrast to susceptible pneumococci, is affected by penicillin consumption. Furthermore, it appears extremely difficult to reduce the incidence of penicillin non-susceptible pneumococci by simply controlling penicillin consumption, assuming that reduced penicillin susceptibility does not confer a fitness cost for the organism. A more judicious use of penicillin together with control measures are in that case required to manage penicillin resistance in pneumococci.

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