

Optimale Strategien für das Testen von Patienten mit diabetischer Retinopathie

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In this paper, we present the first published healthcare application of discrete-event simulation embedded in an ant colony optimization model. We consider the problem of choosing optimal screening policies for retinopathy, a serious complication of diabetes. In order to minimize the screening cost per year of sight saved, compared with a situation with no screening, individuals aged between 30 and 60 should be screened every 30 months, using tests with low sensitivity and high specificity, at an undiscounted cost of around £950 per year of sight saved. If the objective were simply to maximize the total number of years of sight saved, regardless of expense, then tests with high sensitivity and specificity should be used to screen all patients with diabetes every 6 months, at an undiscounted cost of around £4,000 per year of sight saved. The former strategy would incur up to 12 times lower costs in total, but would result in up to 3 times more years of preventable blindness in the population, compared with the second strategy.

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