

ESTIMATING THE TRANSMISSION DYNAMICS OF DENGUE FEVER IN SUBTROPICAL MALAYSIA USING SEIR MODEL

(Menganggarkan Dinamik Penularan Demam Denggi di Subtropika Malaysia Menggunakan
Model SEIR)

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ABSTRACT

In this study, we utilized the SEIR model in conjunction with Heun's predictor-corrector method to analyze the transmission dynamics of dengue fever over time in subtropical Malaysia. Our main focus was on estimating the recovery rate of the infected population and gaining insights into the patterns of disease spread. By applying Heun's method to the SEIR model, we were able to provide more accurate estimations and a comprehensive understanding of the dynamics of dengue fever. We examined the population dynamics of susceptible, exposed, infectious, and recovered individuals, and analyzed the effectiveness of intervention measures. Through our analysis, we not only uncovered the patterns of disease transmission but also shed light on the impact of various control measures. Our findings contribute to the existing knowledge and offer valuable insights into managing and controlling the spread of dengue fever in subtropical regions like Malaysia.

Keywords: mathematics modelling; dengue fever; Heun's predictor corrector method

ABSTRAK

Dalam kajian kami, kami menggunakan model SEIR bersempena dengan kaedah pembetulan peramal Heun untuk menganalisis dinamik penularan demam denggi dari masa ke masa di subtropika Malaysia. Fokus utama kami adalah untuk menganggarkan kadar pemulihan penduduk yang dijangkiti dan mendapatkan pandangan mengenai corak penyebaran penyakit. Dengan menggunakan kaedah Heun kepada model SEIR, kami dapat memberikan anggaran yang lebih tepat dan pemahaman yang komprehensif mengenai dinamik demam denggi. Kami mengkaji dinamik populasi individu yang mudah terdedah, terdedah, berjangkit, dan pulih, dan menganalisis keberkesanan langkah intervensi. Melalui analisis kami, kami bukan sahaja mendedahkan corak penularan penyakit tetapi juga memberi penerangan tentang kesan pelbagai langkah kawalan. Penemuan kami menyumbang kepada pengetahuan sedia ada dan menawarkan pandangan berharga dalam mengurus dan mengawal penyebaran demam denggi di kawasan subtropika seperti Malaysia.

Kata kunci: pemodelan matematik; demam denggi; kaedah pembetulan peramal Heun

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Received: 2 May 2023

Accepted: 15 June 2023

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