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Optimizing the Allocation of Vaccines in the Presence of Multiple Strains of the Influenza Virus

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During the annual flu season, multiple strains of the influenza virus are often present within a population. It is a significant challenge for health care administrators to determine the most effective allocation of two different vaccines to combat the various strains when treating the public. We employ a mathematical model, a system of differential equations, to find a strategy for vaccinating a population in order to minimize the number of infected individuals. We consider various strengths of transmission of the disease, availability of vaccine doses, vaccination rates, and other model parameters. This research may lead to more effective health care policies for vaccine administration.

Information about the Authors:
Ana Eveler (‘15) is a music education major and mathematics minor who shows great interest in applied mathematics. Tayler Grashel (‘13) is a psychology and chemistry major with human biology and mathematical minors. Her interest in biological research and health care brought her into this project. Abby Kenyon (‘15) is a meteorology and math double major. Abby wanted further experience in mathematical modeling. Jessica Richardson (‘15) is an economics major with business and math minors. Jess wanted to gain experience in the mathematical research process.

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