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Simple models in a world of Big Data

Abstract

Technology, and the ability to generate vast volumes of data, has revolutionised Biology. This data deluge is meaningless without a logical framework to help us interpret it. The need for careful, and sometimes very simple, mathematics is greater than ever.

I will discuss some exploratory evolutionary models for the stochastic foraging of fish larvae in search of patchy plankton prey. I will then show how these ideas can be translated towards practical impacts in human health. Leishmaniasis is neglected tropical disease which kills tens of thousands of people annually. By applying the patchy plankton paradigm, together with detailed imaging and cell biology, we have been able to identify new mechanisms for disease transmission which could be important in treatment and eradication programmes.