ABSTRACTS SUBMISSION

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Epidemiological and evolutionary consequences of periodicity in treatment coverage

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Host heterogeneity is a key driver of host–pathogen dynamics. In particular, the use of treatments against infectious diseases creates variation in quality among hosts, which can have both epidemiological and evolutionary consequences. We present a general theoretical model to highlight the consequences of different imperfect treatments on pathogen prevalence and evolution. These treatments differ in their action on host and pathogen traits. In contrast with previous studies, we assume that treatment coverage can vary in time, as in seasonal or pulsed treatment strategies. We show that periodic treatment strategies can limit both disease spread and virulence evolution, depending on the type of treatment. We also introduce a new method to analytically calculate the selection gradient in periodic environments, which allows our predictions to be interpreted using the concept of reproductive value, and can be applied more generally to analyse eco-evolutionary dynamics in class-structured populations and fluctuating environments.

1. What is your pathogen? Multiple options possible (e.g. if working on coinfections)
   - Coronavirus
   - Other viruses
   - Bacteria
   - Fungi
   - Protozoan
   - Metazoan
   - Other

2. On a scale of 1-5 is your work mostly eco/epidemiological or evolutionary? 3
3. On a scale of 1-5 is your work mostly theoretical or experimental/empirical? 1 (100% theoretical or experimental)