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(Don't) Panic! — Modelling changes in human behaviour over the course of an infectious disease outbreak

Suppose there is a new and serious infectious disease circulating in your area. Would you go about your daily life just as you do when there is no threat of becoming ill? Probably not: instead, you might wash your hands more often, avoid contact with clearly infected people, be more diligent about using hand sanitizers before meals, or even avoid public places over the course of the outbreak – all in an attempt to reduce your personal risk of becoming infected. These special disease-induced behaviours have been proposed to explain certain observed epidemic patterns (such as multiple waves of infection), but they are often ignored in mathematical modelling of infectious disease spread.

In this talk, I will provide an overview of some work that has been done to model self-initiated changes in human behaviour due to fear of an infectious disease over the course of an epidemic. One approach has been to define a new class of compartmental models where “fearful” susceptible individuals (those that modify their behaviour to reduce their infection risk) are explicitly incorporated into the model as a distinct disease state. I will discuss these models, as well as on-going work to investigate whether it is possible to distinguish the dynamics of these explicit models from those of the simpler SIR model by using incidence data.