ID de Contribution: **52** Type: **Non spécifié**

Targeted immunization strategies

vendredi 4 décembre 2020 16:00 (30 minutes)

In an homogeneous population, the basic reproduction number of an infection, denoted by R_0, has originally been defined as the number of cases one individual generates on average over the course of its infectious period, in an otherwise uninfected population. This number plays a fundamental role in epidemiology as it provides a scale to measure how difficult to control an infectious disease is. More importantly, R_0 is often used as a threshold which determines whether the disease will die out (if $R_0 > 1$) or whether it can invade the population (if $R_0 > 1$).

This latter property led to the recognition of a simple threshold theorem,mainly that if immunity is delivered at random, then the incidence of the infection will decline if the proportion of immune exceeds $1-1/R0$. Hence, this so-called herd immunity threshold, sometimes abbreviated HIT, is usually given as the targeted percentage of people that have to be vaccinated in order to acquire herd immunity.

When the contacts are not homogeneous, the basic reproduction number is defined as the number of secondary cases generated by a typical infectious individual when all the other individuals are uninfected. In heterogeneous populations, the herd immunity threshold $1-1/R0$ remains if the vaccines are delivered uniformly in the population. However, one can even achieve herd immunity with a proportion of immunized individuals lesser than $1-1/R_0$ by targeting certain group within the population. It is then natural to ask how to devise optimal allocation strategies for limited vaccines.

The aim of this presentation is to introduce an SIS infinite-dimensional model with vaccination and prove the existence of optimal vaccination strategies for this model. In the second part of the talk, I will discuss algorithms to compute these optimal allocations.

Auteurs principaux: DRONNIER, Dylan (CERMCIS); Dr ZITT, Pierre-André; Dr DELMAS, Jean-François

Orateur: DRONNIER, Dylan (CERMCIS)

Classification de Session: Session parallèle 10