# Dynamics and control of vaccine-preventable infectious diseases spread

Rossella Della Marca

Università di Parma

Mathematical epidemiology plays a key role in supporting health authorities, providing indications on the spread of infections and intervention strategies. In this context, we present two SIR-like models for vaccine-preventable infectious diseases which incorporate appropriate control functions. In particular, we search for the 'optimal' control, namely the one that minimizes suitable disease-related costs. The first problem concerns childhood diseases spread under voluntary immunization regimes and the fight against parents hesitancy via public vaccine awareness campaigns. The second one is a time-optimal vaccination control problem in the framework of a single epidemic outbreak under the assumption of limited control resources.