-cycle 29th
ORAL DEFENCE OF THE PHD
THESIS

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Mathematical modeling for
epidemiological inference and
public health support

Abstract:
Mathematical modeling have a wide range of applications in epidemiology and public health. Models can help identifying the key general mechanisms driving the complex dynamics of infectious diseases. Moreover, they play a crucial role in evaluating the efficacy of possible interventions, thereby supporting public health authorities in the choice of adequate strategies for the effective prevention and control of infection. This thesis faces some of the current challenges in the field of computational epidemiology of infectious diseases. First, I investigate the role played by demographic processes in the dynamics of varicella and Herpes Zoster to evaluate the cost-effectiveness of vaccination in Italy. Second, I identify human behavioral changes as one of the possible determinants of the spatiotemporal spread of the 2009 H1N1 influenza pandemic in England. Finally, I investigate the current dynamics of measles in Italy to shed some light on the epidemiology of vaccine-preventable diseases when viral circulation is low.

Relatori:
Andrea Pugliese e Stefano Merler