

THE DEPARTMENT OF MATHEMATICAL SCIENCES PROUDLY PRESENTS

COLLOQUIUM

SPRING 2015

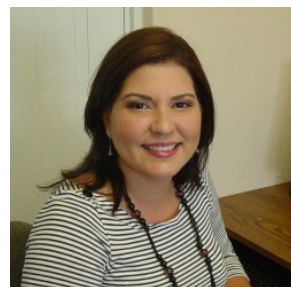
On the estimation of epidemiological parameters: dengue fever in PR as an example

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ABSTRACT



In this talk, I will briefly discuss some mathematical and statistical aspects of *inverse* or *parameter estimation* problems for models of non-linear ordinary differential equations. Following a basic example, I will elaborate on two problems recently studied on the estimation of epidemiological parameters for dengue fever from incidence data of confirmed by laboratory dengue cases in Puerto Rico. In one case, we construct a mathematical epidemiological model with seasonality of nonlinear ordinary differential equations to estimate epidemiological parameters from a time dependent transmission function. Among the estimated parameters are the average effective vector-human contact rate and the amplitude of seasonality of that rate on the island. In the other work, the model takes into account the dynamics of initial joint evolution for dengue serotypes DENV1 and DENV4. In this case, we estimated the transmission rates from mosquitoes to humans for each serotypes during the epidemics that occurred in the years 2010 and 2012 in Puerto Rico. For the estimation we implemented the method of least squares and a statistical model to measure the errors in the estimated values. Residuals plots were used as diagnostic tools of the underlying assumptions of the estimation techniques.

Monzón Building, Room 201, 10:45 AM
Refreshments will be served
15 minutes before the colloquium, M213

