

# M9 Biomathematics

Organiser: Sylvia Kiwuwa, *Aalto University*

## **1. How Rare is Rare? Fat-Tailed Distributions in Biostatistics**

Matias Heikkilä, *Aalto University*

Quantifying the rate at which a distribution vanishes at infinity is a formal way of describing the prevalence of extreme observations. For many familiar distributions this rate is exponential. However, the case of a polynomial rate is gaining increasing interest due to the extensive empirical evidence of its significance in several fields.

In this talk we will discuss these fat-tailed distributions in biostatistics and theoretical questions related to fat-tailed distributions.

## **2. Comparison of Cancer Incidences in Denmark, Finland and Norway**

Marianne Honkasaari, *Aalto University*

We will discuss trends of testicular cancer and ovarian cancer incidences in Denmark, Finland and Norway and compare them. Especially the effects of age at diagnosis, period of diagnosis and birth cohort on incident rates will be observed. The age-period-cohort model will be shortly introduced and different graphs will be analysed.

## **3. Phylogenetic insights into HIV-1 regional transmission in high risk communities**

Sylvia Muyingo, *Aalto University*

Fishing communities have been characterised as high HIV risk populations in Sub-saharan Africa and HIV prevention efforts continue. We apply viral phylogenetic analyses with clinical epidemiological and socio-demographic factors for a comprehensive understanding of HIV-1 transmission patterns in 5 fishing communities on the shores of Lake Victoria in Uganda to inform HIV control interventions.

#### **4. Modelling the neutral mismatch distributions of bacteria.**

Mikhail Shubin, *University of Helsinki*

The structure of the bacterial population have an impact on its persistence and evolution. A mismatch distribution is a common summary statistics used to describe the genetic diversity of a population. We study the dependence of the mismatch distribution on a population structure using the simulation approach.