Stochastic model of pathogen concentrations in water sources

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**Research field**  Water & health

**Subject title**  Stochastic model of enteric pathogens in water sources in the Netherlands

**Project proposal**

**Introduction**
Enteric pathogens are causing the main burden of waterborne disease worldwide. Pathogens enter the water environment mainly via discharges of (treated) domestic wastewater, combined sewer overflows, but also via run off from livestock manure and fecal input from wildlife. Understanding the pathogen presence in different water types is essential for appropriate health risk management of water systems. Pathogen monitoring is complex and expensive and has been conducted in a multitude of studies over the years, focusing on different pathogens and different water sources. These data serve as input for microbial risk assessment. The objective of this BSc thesis research is to develop stochastical descriptions of the concentration of different enteric pathogens in different water types. This will greatly facilitate future risk assessments of pathogens in water.

**Study design**
The main tasks are to define categories different water types, collate the available data on different enteric pathogens (Campylobacter, Cryptosporidium, Giardia, enterovirus) from different studies in each water type in a database and fit statistical distributions to the pathogen data. It is anticipated to start with a single pathogen and water type and develop the stochastical analysis and use this frame to address the other pathogens and water types.

**Requirement**
Basic understanding of statistics.
You will be working partly at KWR Watercycle Research Institute in Nieuwegein.