Building an early warning system for tick- and rodent-born diseases in Europe

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The number of recorded emerging zoonotic diseases due to various micro-organisms harboured by rodents and ticks in Europe is increasing. Several factors may be involved in this rise, ranging from the capacity to identify new pathogens and recognise clinical signs of disease, to real changes in exposure and the spatial and temporal distribution and prevalence of a disease. As driving factors, modification in habitat structure, animal community structure and climate as well as socio-economic changes occurring in Europe during recent decades, are described. Because of the significant burden some of these diseases cause for public health, such as TBE, Lyme borreliosis and nephropathia epidemica, the establishment of an early warning system for risk evaluation, disease prevention and control, is urgently required. Within the European Project EDENext (Biology and control of vector-borne infections in Europe; www.edenext.eu) a joint effort to establish a network of monitoring sites for rodents and tick borne pathogens has been established in 9 European countries (Italy, Finland, Sweden, Belgium, Germany, France, Slovakia, Czech Republic and Hungary). Several innovative monitoring tools are used simultaneously, ranging from remotely sensed climatic and environmental parameters to the identification of pathogens in ticks and hosts using advanced molecular tools, to disease risk evaluation through mathematical modelling. The general theoretical framework supporting the survey design and the expected results will be presented and discussed.