Kolloquium „Statistische Methoden in der empirischen Forschung"

Wann: 27. Januar 2015, 17:00 – 18:30 Uhr

Wo: Lebenswissenschaftliche Fakultät, Humboldt-Universität zu Berlin,
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White elephants, p-values and simulating conceptual models for Animal Health problems

When wildlife and livestock hosts share an emerging disease there is the tendency to blame wildlife as source for continued circulation of the infection. The emergence of FMD (foot-and-mouth disease) and ASF (African swine fever) in Bulgarian and Russian wild boar provides very recent examples. The observation of such landscape-scale spread of an infection (e.g. several years for ASF in South Russia) often is brought together with the concept of endemicity, i.e. the repeated occurrence of the infection in previously affected populations. The Animal Health implications, however, differ tremendously if the problem is turning into permanent exposure (e.g. rabies in foxes) or ceases after a wavy fade-out (HAPI in water birds). We propose an individual-based ecological model of wild boar to simulate both Animal Health concepts for free-ranging wildlife species. For real world corres-pondents, e.g. Classical Swine Fever virus Rösrath and Foot-and-Mouth Disease virus in wild boar, there is observational evidence of the endemic or non-endemic course in the host population, respectively.

A statistical algorithm is constructed using deliberate case notifications with space-time attribute to test the hypothesis of an endemic disease situation being congruent with the data. The approach catches the spatial and temporal association between data points and compares it to the patterns of an endemic infection. Technically, a data point is labelled as endemic if it occurs within a given distance of previous observation, but with a minimum period of time between both. The count of such "cases" is the output of the algorithm. Using randomization, the endemicity hypothesis as stated for a given data set is assigned with a p-value.

The algorithm then will be applied to ASF data from Russia reported in WAHID (OIE) between 9-2009 and 4-2011 which previously were understood as evidence of an endemic situation in wild boar. Based on the algorithm, however, the null hypothesis of an endemic situation of ASF in Russian wild boar was rejected. We discuss the implications of a static understanding of disease spread in Animal Health problems which may cause extra efforts without use – a modern white elephant.