Results of four years of digital urban monitoring of *Rattus norvegicus* with RatMap in Hamburg including data on infestation near the surface and in underground sewers

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Background

The digital monitoring system RatMap is used to monitor urban rat populations in Hamburg, Germany. In addition to the analysis of surface data, data from infestations in underground sewers are compared for the first time in Germany.

Methods

Infestation was identified systematically according to a case definition for rat infestation. Descriptive analysis of the data was done with EpiInfo (CDC), and the MySQL data-base RatMap linked to ArcGis (ESRI), which allows analysis of rat infestations in space and time, and the extent and outcome of control measures. However, activities of the Institute are limited to the occurrence of rats near surface of public property. Therefore, data from the sewer system provided by Hamburg water public works were entered into the geo-database. Results of evaluation over a period of four years are demonstrated. If applicable, 95 % confidence intervals were calculated.

Results

In the period from 2007 to 2010, 8,770 rat indications were notified to the database. Following the case definition for above-ground rat infestation, 7,278 were rated as true infestations, with 2,214 cases in 2007, 2,507 in 2008, 1,194 in 2009, and 1,393 in 2010 respectively. Rat incidence peaked significantly in the summer months in 2008, and decreased significantly in the summer months of 2009. Annual frequencies show at least two peaks in April and in July, where patterns may differ related to seasonal temperature cycles. The number of cases from a private pest control company roughly reflects the cases on governmental property. The frequencies of the numbers of rat notifications over the last 17 years show similar patterns compared to an index of small wild rodents monitored by a forest department in northern Germany. The geographic reflection of data from above ground infestations of *Rattus norvegicus* is not always consistent with the one from underground infestations.