

Kolloquium „Statistische Methoden in der empirischen Forschung“

Wann: 05. November 2019, 17:00 – 18:30 Uhr

Wo: Robert Koch-Institut | Nordufer 20 | 13353 Berlin (Wedding),
S41, S42, U9 Westhafen | U9, Bus 142 Amrumer Str

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Methods to estimate the number of non-exposed cases in a population – with application to lung cancer and passive smoking exposure

National mortality statistics commonly provide disease-specific absolute and relative frequencies and rates of death by sex and age, but not by exposure status. However, it is often of interest to know how many of the diseased individuals, i.e. the cases, were exposed or not exposed to a specific risk factor.

We present two methods to estimate the number of exposed and non-exposed cases, both of which require an estimate of the exposure prevalence in the non-diseased population. Method I additionally requires an estimate of the relative effect of the exposure, i.e. a relative risk function if the exposure has a continuous distribution, or a categorical estimate if the exposure is categorical. Method II additionally requires an estimate of the disease rate among the non-exposed. We provide theoretical justifications, an R script to calculate the probability for non-exposure among the diseased for Method I, and suggest approaches for sensitivity analyses. Both methods are subsequently applied to the estimation of the number of never smokers among lung cancer deaths.