

Use of police registrations and development capture-recapture methods

Summary

The project 'Use of police registrations and development capture-recapture methods' is a research project was carried out from 1999 to 2002 by the department of Methodology & Statistics of Utrecht University by order of the Scientific Research and Documentation Centre (WODC) of the Dutch Ministry of Justice. The goal of the project was twofold. First goal was a feasibility assessment of using police registration data from the Dutch registration system HKS to estimate the size of delinquent populations. A second goal was the further development of models within the capture-recapture method.

In the project estimates were made of the total number of individuals driving drunk and illegally possessing a weapon in the period 1996 to 2001. The estimates are based on registration data from the HKS of persons that were apprehended at least once during that period. The registration data was transformed into capture-recapture data and included the number of apprehensions as well as some background variables, like age, sex and number of registrations for other criminal acts. The data were analysed with the zero-truncated Poisson regression model.

The project has shown that police registration data from the HKS can be used to estimate the size of delinquent populations. The conversion of registration data into capture-recapture data has, however, proven to be an extremely complicated and time consuming process. Therefore, a manual is included in the report that alerts future researchers to problems and traps related to the creation of capture-recapture data from police registrations.

The most important theoretical development is the derivation of a confidence interval of the population size estimate so that it has an upper and a lower limit. With a confidence interval the interpretation of the population size estimate has become much more meaningful. The project has led to a substantially better understanding of the consequences of violations of model assumptions and to a better knowledge of the applicability of alternative models, like the negative binomial regression model.

The analyses show that on a national scale approximately between 400,000 and 500,000 individuals at least occasionally drive drunk and that there are about 200,000 to 300,000 persons illegally in possession of a weapon. The fact that minor, but systematic, discrepancies between data and model were found, indicates a violation of model assumptions. In view of specific systematic pattern of the discrepancies, the above-mentioned population sizes estimates should probably be interpreted as an (slight) underestimation of the true population sizes.