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Cover Letter January 8, 2025

Dear Editors of the Journal of Statistical Software,

we are writing to submit a revised manuscript of our article entitled ***singleRcapture**: An R Package for Single-Source Capture-Recapture Models* for review to the Journal of Statistical Software (previous submission number: 5538). We have considered all the comments on paper and software (see responses on next page).

Population size estimation is a major challenge in official statistics, social sciences, and natural sciences. The problem can be tackled by applying capture-recapture methods, which vary depending on the number of sources used, particularly on whether a single or multiple sources are involved. This paper focuses on the first group of methods and introduces the `singleRcapture` package in the R language (version 0.2.1.4 the same as on CRAN).

Our package serves to bridge a significant gap, as the SSCR methods are either not available at all or are only partially implemented in existing R packages and other open-source software. It offers state-of-the-art single-source capture-recapture (SSCR) models (e.g. zero-truncated one-inflated regression) together with new developments proposed by the authors, and provides a user-friendly application programming interface (API).

The novelty and our contribution can be summarised as follows:
- The package implements and extends existing SSCR methods together with new developments proposed by the authors.
- The package can be used to produce point estimates and calculate their variances; it also implements several bootstrap variance estimators.
- It implements diagnostics (e.g. rootograms) to assess quality and conduct sensitivity analysis (e.g. dfbetas).
- The package relies on the `S3Methods`, which can be easily applied by users who know how to run regression in R (e.g. `stats::glm`, `countreg`).
- The package enables flexible estimation of population size for user-specified strata and is fully integrated with the `sandwich` package.
- The `singleRcapture` package can be used to implement custom function families, which is an option advanced users will find particularly useful.

The `singleRcapture` package has been created for users interested in estimating the size of populations, particularly those that are difficult to reach or measure, for which information is available only from one source and dual/multiple system estimation is not applicable. The package has been developed since 2021 and the full history can be found at the Github repository `https://github.com/ncn-foreigners/singleRcapture`.

To the best of our knowledge, there is no open-source software that can be used to estimate population size with SSCR methods and includes variance estimators or diagnostics. That is why we believe that the paper will be of interest to the readership of the Journal of Statistical Software.

Thank you for your consideration of this manuscript.

Sincerely,
Maciej Beręsewicz & Piotr Chlebicki

Replies to general comments from the Editor (submission 5538)

- The submission "singleRcapture: An R Package for Single-Source Capture-Recapture Models" presents an R package which implements single-source capture-recapture methods for population size estimation using zero-truncated, zero-one truncated and zero-truncated one-inflated Poisson, Geometric and Negative Binomial regression as well as Zelterman's and Chao's regression. The submission also promotes package singleRcaptureExtra and uses it in the replication material. However, this package is neither included in the supplementary material nor available from a standard repository such as CRAN. In case the features of this package are to be highlighted in the manuscript both would be required.

  - We have removed the `singleRcaptureExtra` package from the paper as the main foucs should be on the `singleRcapture` package. We briefely mention this package in the conclusions.

- In addition it might be good to check class structure and inheritance to ensure that all classes defined have some methods associated and that class inheritance works (i.e., if a method does not work for the object for the more general class one would need to write a method for the specific class with a suitable error message).

  - We have corrected methods and classes as suggested by the Editor. An updated version of the package was uploaded on CRAN and the paper is based on the newest version of the package.

- We decided not to send the current submission into review. We would like to ask the authors first to decide on if they want to have singleRcaptureExtra included in the submission and thus be also reviewed and included as software component of the submission, inspect the classes and methods structure as well as check the replication material and provide a broader overview on available related functionality for statistical software packages.

  - We have included information on other software from different languages (e.g. Python, Julia), focused on the `singleRcapture` package and corrected the replication materials.