



EDITORIAL

40th Anniversary of the Brazilian Journal of Biometrics

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Abstract

2022 marks the 40th anniversary of the Brazilian Journal of Biometrics. In honor of this occasion, the last issue of 2022 features invited contributions from our editorial board, along with a brief journal history.

Keywords: Brazilian Journal of Biometrics, Statistics; Data science; Biometrics.

1. Brief history of the *Brazilian Journal of Biometrics*

The *Brazilian Journal of Biometrics* (BJB) is an international journal published quarterly by the Publisher of the Federal University of Lavras, Brazil. BJB is the official journal of the Brazilian Region of the International Biometric Society. The general objective of the journal is to publish original research papers that explore, promote, and extend statistical, mathematical and data science methods in applied biological sciences.

BJB is a peer-reviewed journal aimed at both statisticians, data scientists, and scientists who use statistical methods in different branches of biology, including agriculture, animal sciences, ecology, forest, food science, genetics and plant breeding, livestock, medicine, public health, soil science, veterinary science and, wood science to name but a few. The BJB has neither article submission nor article processing charges.

This Special Issue celebrates the fortieth anniversary of the *Brazilian Journal of Biometrics*. It is an opportunity to acknowledge Editors, Associate Editors, reviewers, and all authors that have contributed to the development of the *Brazilian Journal of Biometrics*.

The *Brazilian Journal of Biometrics* was founded in 1983 at São Paulo State University (UNESP) – Campus Jaboticabal under the name of *Revista de Matemática e Estatística* (Journal of Mathematics

and Statistics; ISSN: 0102-0811), with annual periodicity until 2002, with 20 issues in 20 years. In 2003, aiming at a faster circulation of articles, it became a quarterly publication. Between 1983 and 2004, the journal was published in print only (ISSN: 0102-0811), and in 2005 it became an electronic journal (ISSN: 1980-4245). In 2007, the journal changed the name to *Revista Brasileira de Biometria* (Biometric Brazilian Journal; ISSN: 1983-0823) to meet a growing demand for the development and application of statistical methods in the field of biological sciences.

At the beginning of 2016, the journal's headquarters moved from the São Paulo State University (UNESP), Campus Jaboticabal, SP, Brazil, to the Department of Statistics, at the Federal University of Lavras, MG, Brazil. At this time, the Journal began a new phase in its history with a new submission system, monitoring, and publication of articles using the Open Journal Systems.

In 2021, the Journal became the official Journal of the Brazilian Region of the International Biometric Society, representing the third Era of the Journal. Specific rules and duties were created for the editorial board members, and a plan for marketing and internationalization was set up. In March 2022, the name of the Journal became *Brazilian Journal of Biometrics* (ISSN: 2764-5290), and after 2022 only accepts submissions written in English.

From 1983 to 2015, the journal was financially supported by UNESP through its Central Coordination for Graduate Education as regards its editorial production, printing, and distribution. Since 2016, the Federal University of Lavras has partially financed the Journal. In 2021, a large part of the financial support for the *Brazilian Journal of Biometrics* came from the Brazilian Region of the International Biometric Society.

For forty years, the *Brazilian Journal of Biometrics* has been published without interruption, without charging any fees to authors and readers, thanks to the voluntary work of its Editors, Associate Editors, and Reviewers. In particular, we acknowledge the contribution of the Editors-in-Chief of the *Brazilian Journal of Biometrics*: Euclides Braga Malheiros (1983 – 2015), João Domingos Scalon (2016–2020), and Tales Fernandes (since 2021) for keeping the Journal alive and always very active.

2. The scientific articles in this Special Issue

The year 2022 marks the 40th anniversary of the *Brazilian Journal of Biometrics*. In honor of this occasion, the last issue of 2022 features invited contributions from our editorial board members. We were very pleased with the outstanding outcome regarding the quality of the papers in this special issue, which exceeded all our expectations. This special issue includes ten papers that cover a number of the topics related to the mission of the *Brazilian Journal of Biometrics*: Promoting the development and application of statistical and data science methods to biological sciences.

Oliveira *et al.* (2022) uses statistical learning algorithms such as logistic regression, K-nearest neighbors, decision trees, random forest, and support vector machines for diabetes classification. They consider these models separately and combined via hard and soft voting classifiers, showing that, in their application, the use of a soft voting classifier combining random forest, SVM, and KNN yielded the best performance in all metrics considered, indicating that this is the most suitable model for predicting diabetes in this database.

Scalon *et al.* (2022) advocate that a complete characterization of the interaction between spatial and size distributions of second-phase particles in composite materials that are used in the manufacture of biomedical instruments might be carried out by applying bivariate spatial point process methods.

Silva *et al.* (2022) aim to identify demographic, socioeconomic, and health factors that influenced the reduction of fertility levels in the 1262 municipalities that compose the Brazilian Semi-arid region in 1991–2010. They applied the panel data regression model, showing that the reduction in the Gini index and the illiteracy rate, and the increase in life expectancy at birth and the aging rate contributed significantly to the decrease in fertility levels in the Semi-arid region.

Trinca & Garcia (2022) proposes a general strategy for model-building and variable selection that takes advantage of the fractional polynomials within the framework of linear mixed models. They have also applied their method to three data sets from the literature, known for violating the linearity assumption, illustrating that it is possible to solve the problem of lack-of-fit by using fewer terms in the model than the usual approach of fitting higher-order polynomials.

Colosimo *et al.* (2022) treated binary response with cure fraction for correlated data adopting a Generalized Estimation Equations model using the Expectation-Solution algorithm version to take into account the cluster structure. A Monte Carlo simulation evaluated the small sample properties of the proposed estimators, and real data illustrated the results. In the application, they aimed to identify risk factors for the presence of External Inflammatory Root Resorption (EIRR) using a real data set about replanted permanent teeth referred to treatment at the Dental Trauma Clinic of the School of Dentistry from the Federal University of Minas Gerais (DTC-SD-UFMG), Brazil, after emergency care at the Metropolitan Hospital Odilon Beherns in Belo Horizonte, Brazil. They considered a logistic regression type model to study the association between clinical and radiographic factors and the presence/absence of EIRR, measured radiographically at the first patient appointment at DTC-SD-UFMG.

Fernandes *et al.* (2022) presented the weighted importance resampling as an alternative for the bayesian estimation of parameters in nonlinear double sigmoid regression models. They successfully applied this methodology in the estimation of parameters of the nonlinear double logistic model for the description of coffee fruit growth.

Nakamura *et al.* (2022) presented the Box-Cox family of distributions as an interesting alternative to fit censored data under the generalized additive models for location, scale, and shape (GAMLSS) framework. Among the considered distributions, the Box-Cox power exponential returned the best (smallest) AIC and BIC values when compared to the Box-Cox t (BCT) and Box-Cox Cole and Green (BCGG) distributions. Moreover, the BCPE distribution outperformed the Weibull distribution, which was previously fitted to these data.

Tighiouart *et al.* (2022) investigate the claims that there is no added value in including an interaction term to model synergism between the two drugs in parametric Bayesian designs of early-phase cancer clinical trials in the setting of continuous dose levels of the two agents. They used parametric models to describe the relationship between the doses of the two agents and the probability of dose-limiting toxicity and efficacy. They also compare trial safety and efficiency of the estimated maximum tolerated dose curve between models, including an interaction term with models without the synergism parameter, with extensive simulations.

Carrilho & Lopes (2022) applied sparse and robust sparse logistic regression models with the elastic net penalty to glioma RNA-seq data from The Cancer Genome Atlas to identify relevant transcriptomic features in the separation between lower-grade glioma (LGG) subtypes and identify putative outlying observations, yielding good accuracies for all all classification models and selecting different sets of genes.

Freitas *et al.* (2022) study discrete mortality data for groups of individuals observed over time and present four models suitable for grouped multinomial data, three of which are directed towards handling overdispersion. The application is made to a specific insect bioassay of the fungus *Beauveria bassiana*.

It is our understanding that this Special Issue contributes to increasing knowledge in biostatistics, biometry, and data science, by fostering discussions about real data problems.

We want to finalize this editorial by thanking the authors for sharing their exciting work in this special issue and the reviewers for their critical feedback that helped improve the quality of this special issue. We acknowledge the Editors and Associate Editors who have contributed to the Brazilian Journal of Biometrics development over the past 40 years.

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