Imputation Plots

Theiss Bendixen

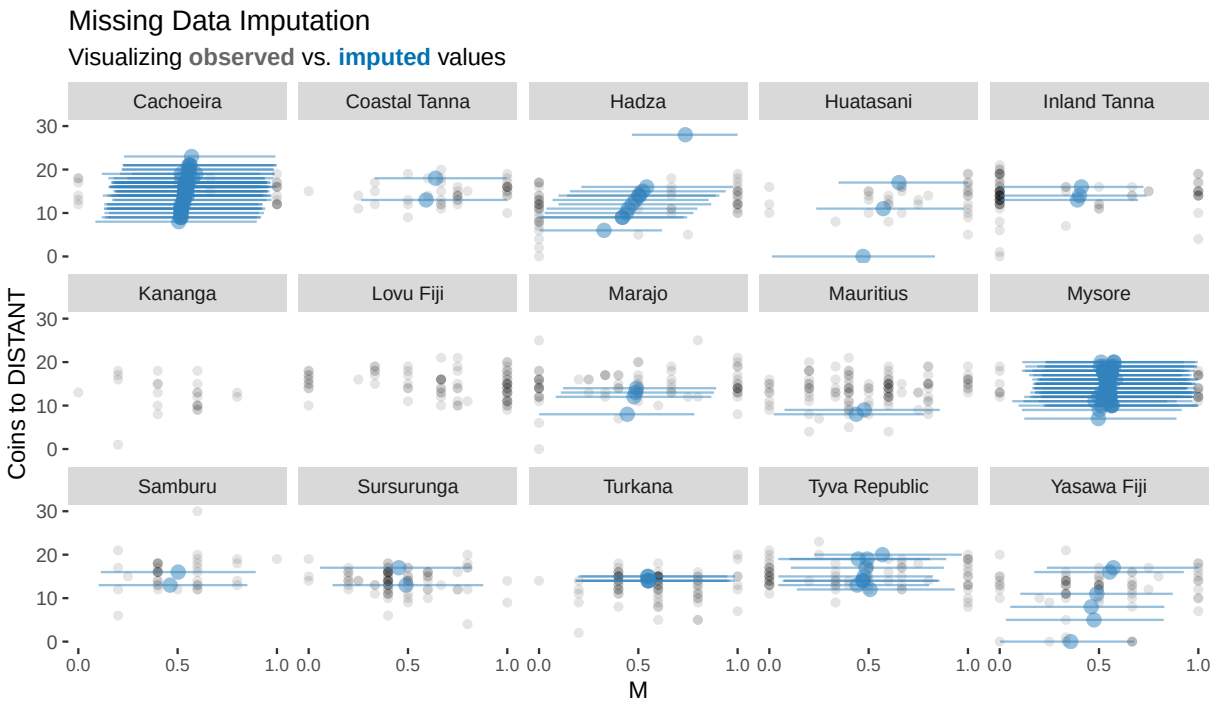
2023-01-19

Introduction

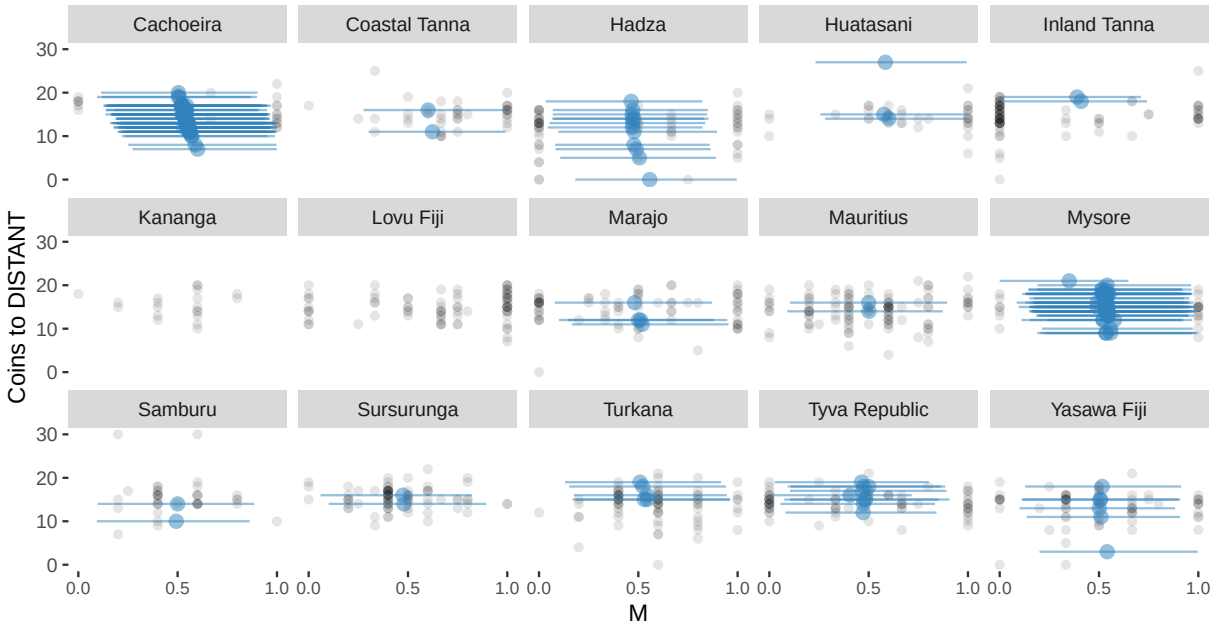
This notebook reports plots from missing data imputations of all variables and across all main models. The imputations of the supplementary models can also be inspected, see the `.Rmd` file for details.

In the plots, the black points are observed values, while the blue points and intervals are posterior means and HPDIs of the imputed values. The **caption gives the model** – e.g., `RAG SELF INT` refers to the RAG SELF interaction model and `RAG SELF ADD` refers to the RAG SELF additive model – and the ***x*-axis gives the variable key**.

Note that for the binary variables food security (`S`) and game check (`check`), the imputed values are the probabilities of a 1 (denoted, respectively, by ϕ_{food} and ϕ_{check} in our formal model notation).



RAG SELF INT Model.
Imputed values are posterior means and 89% HPDIs.



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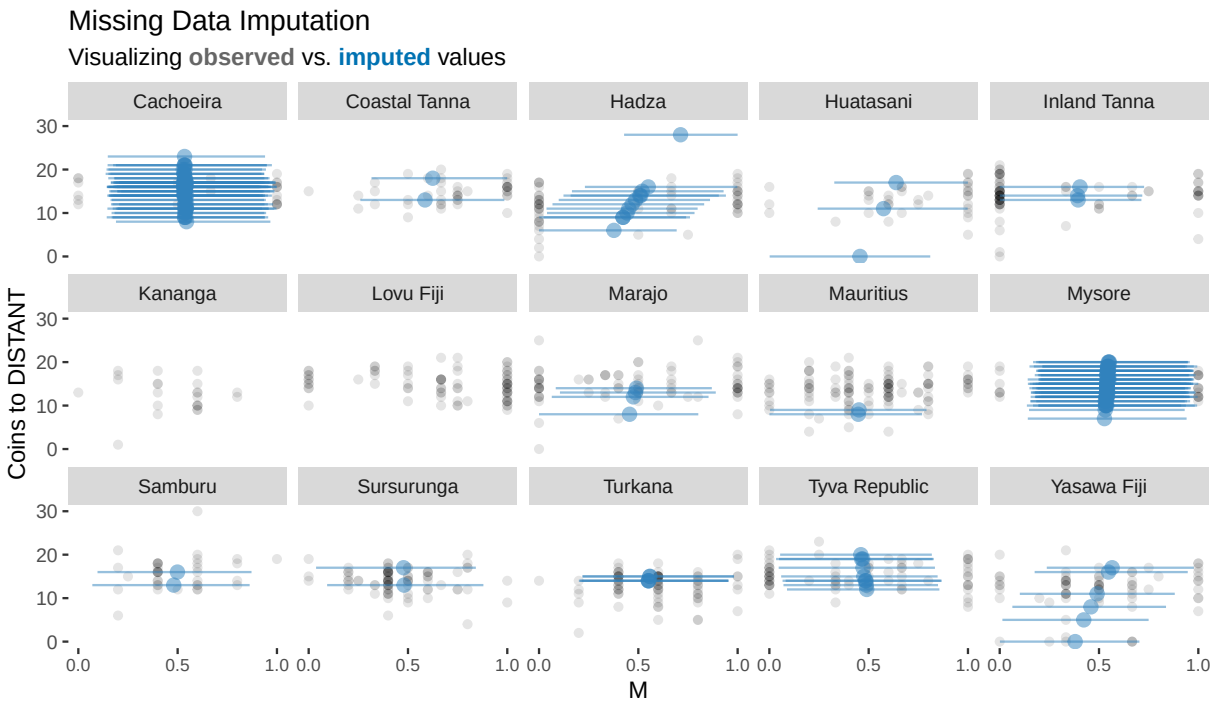

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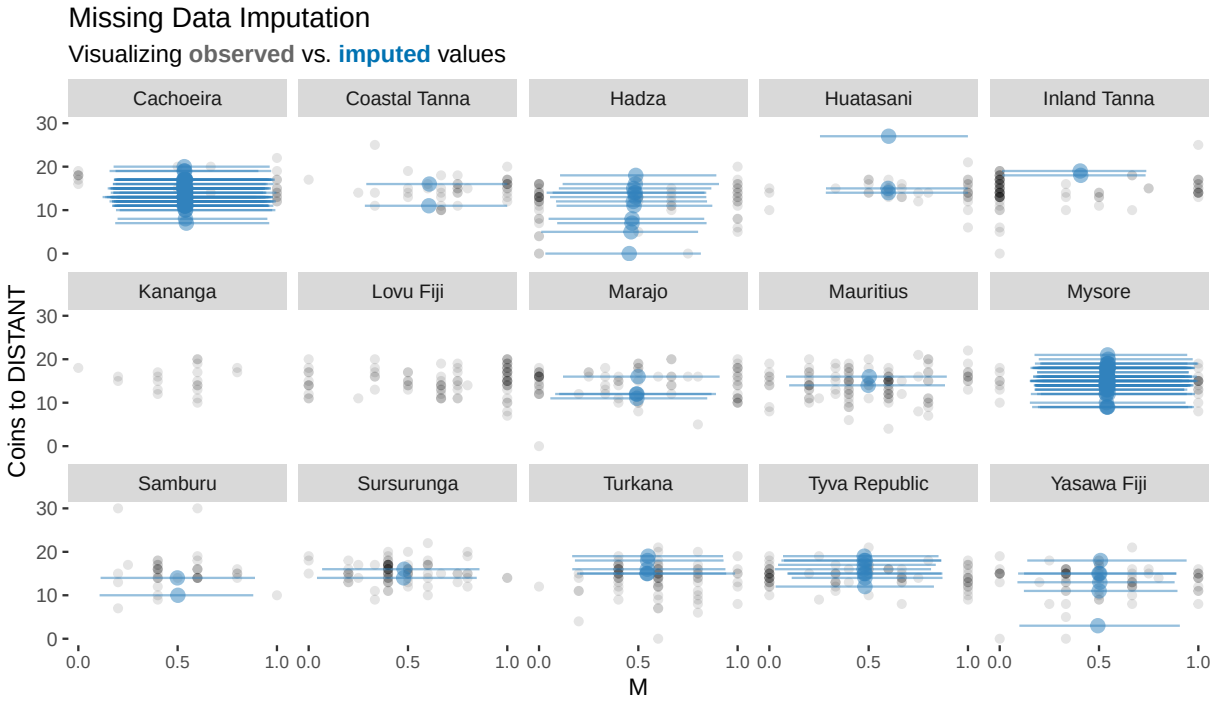

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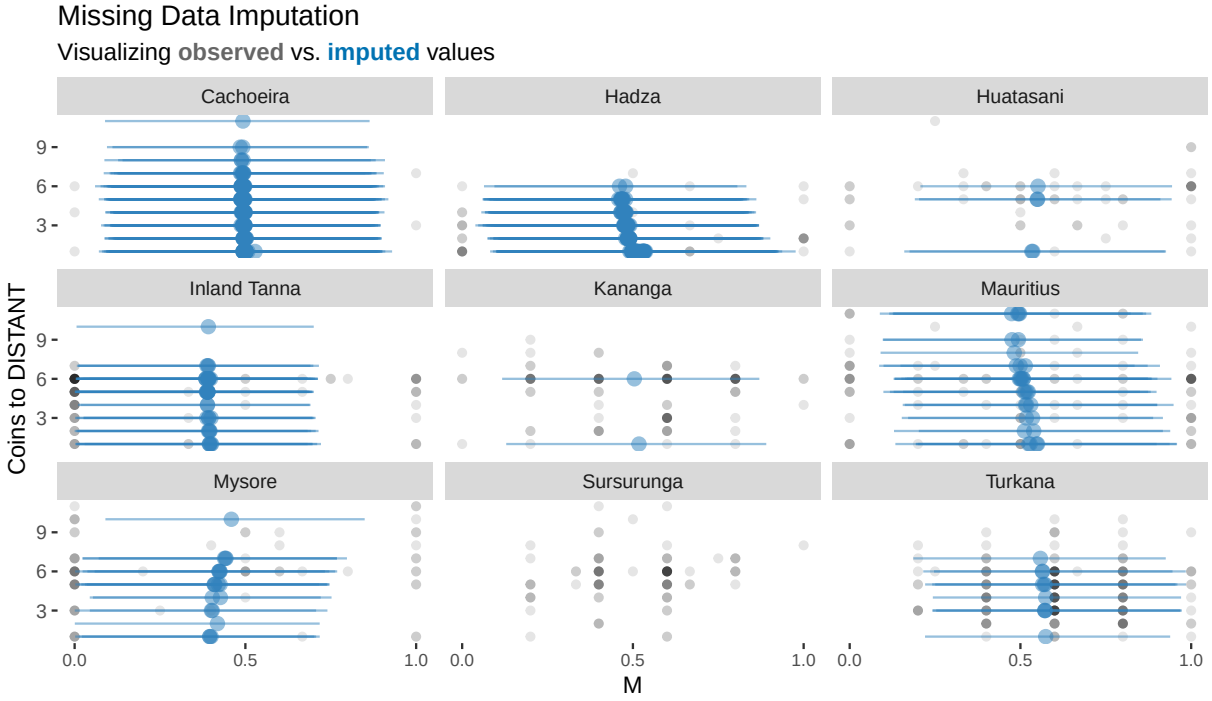

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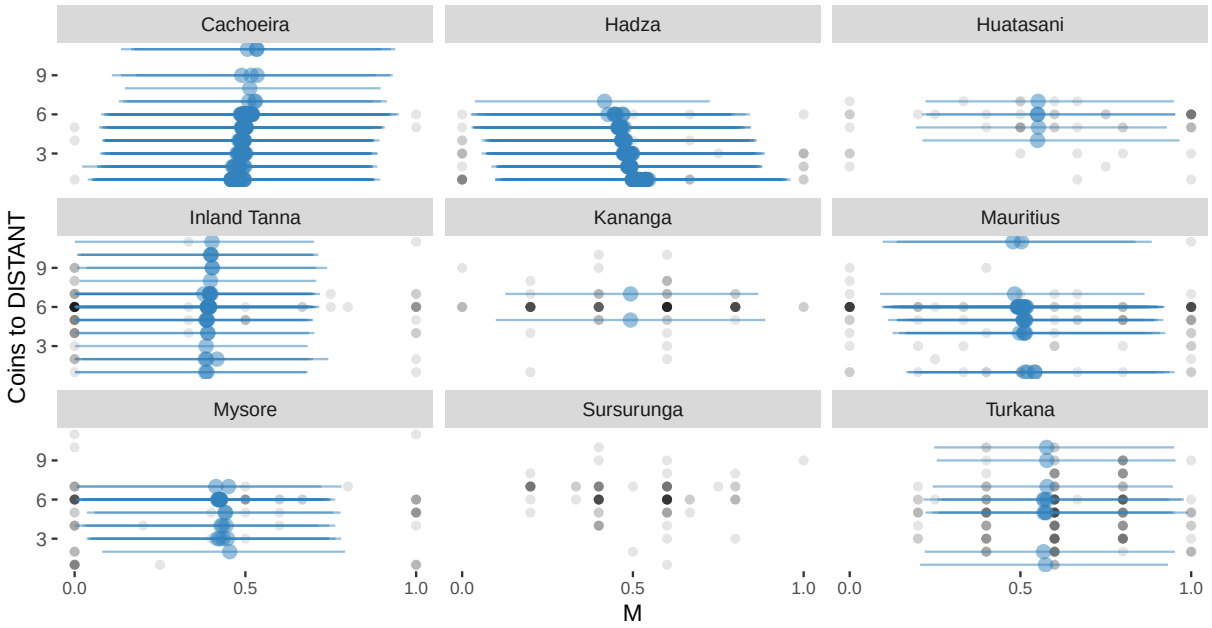

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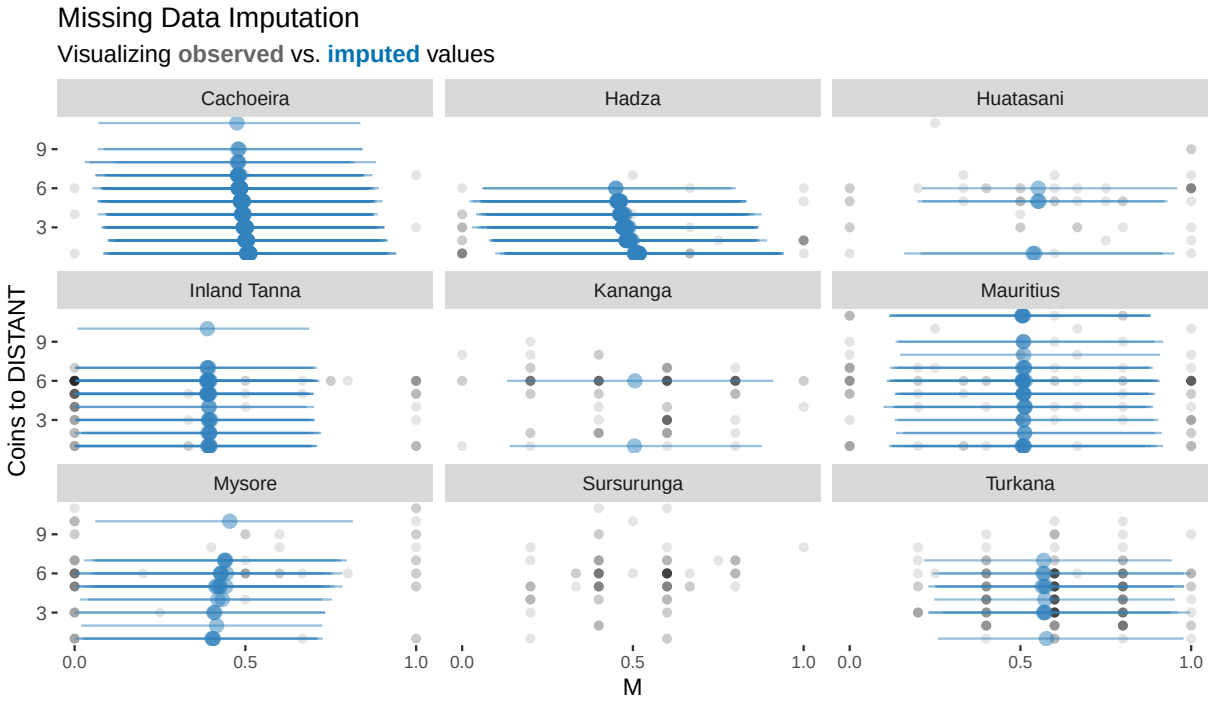

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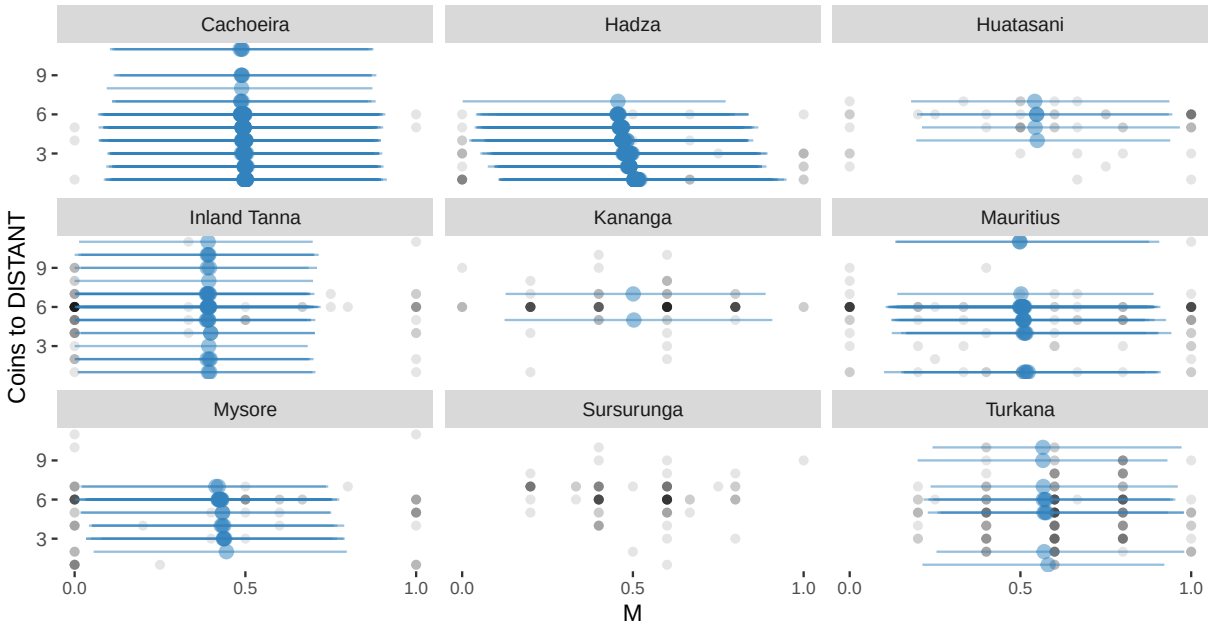

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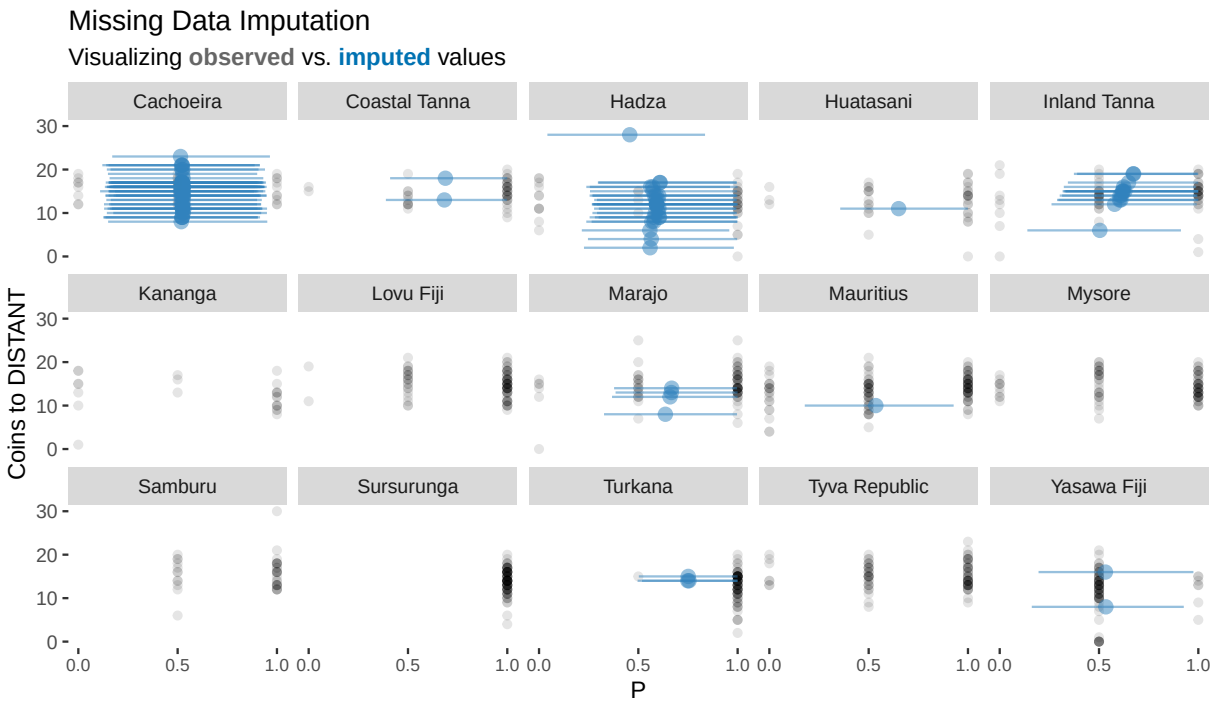

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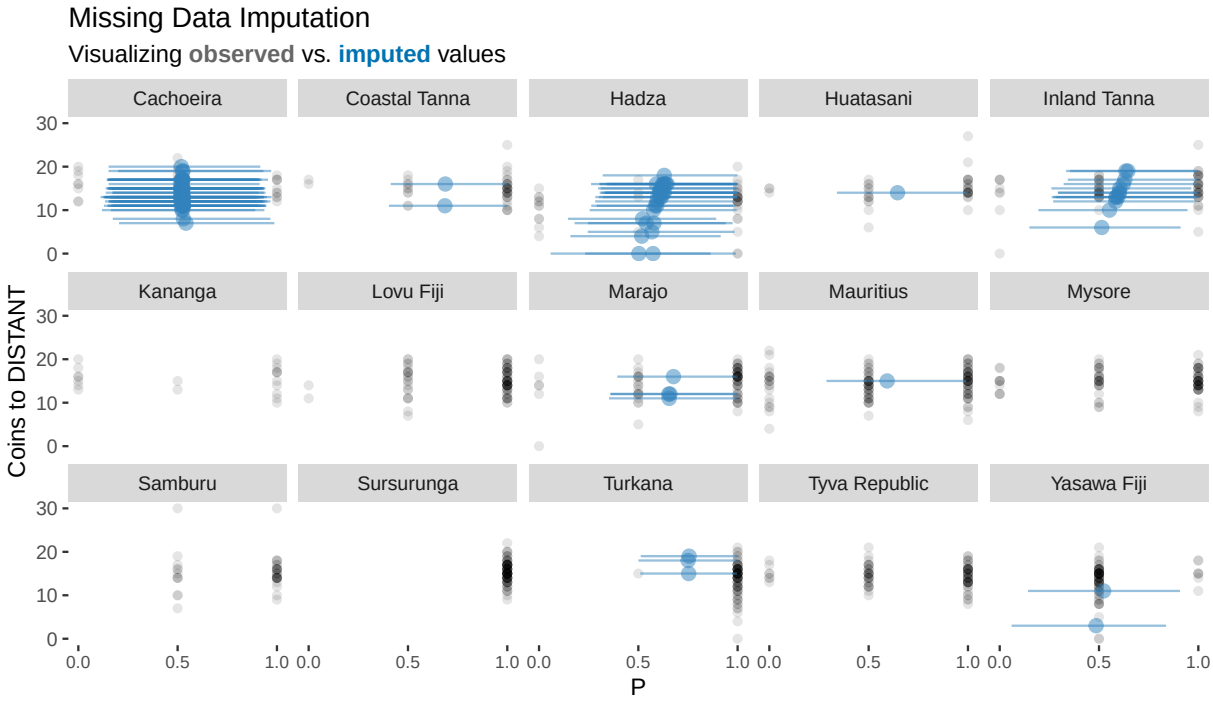

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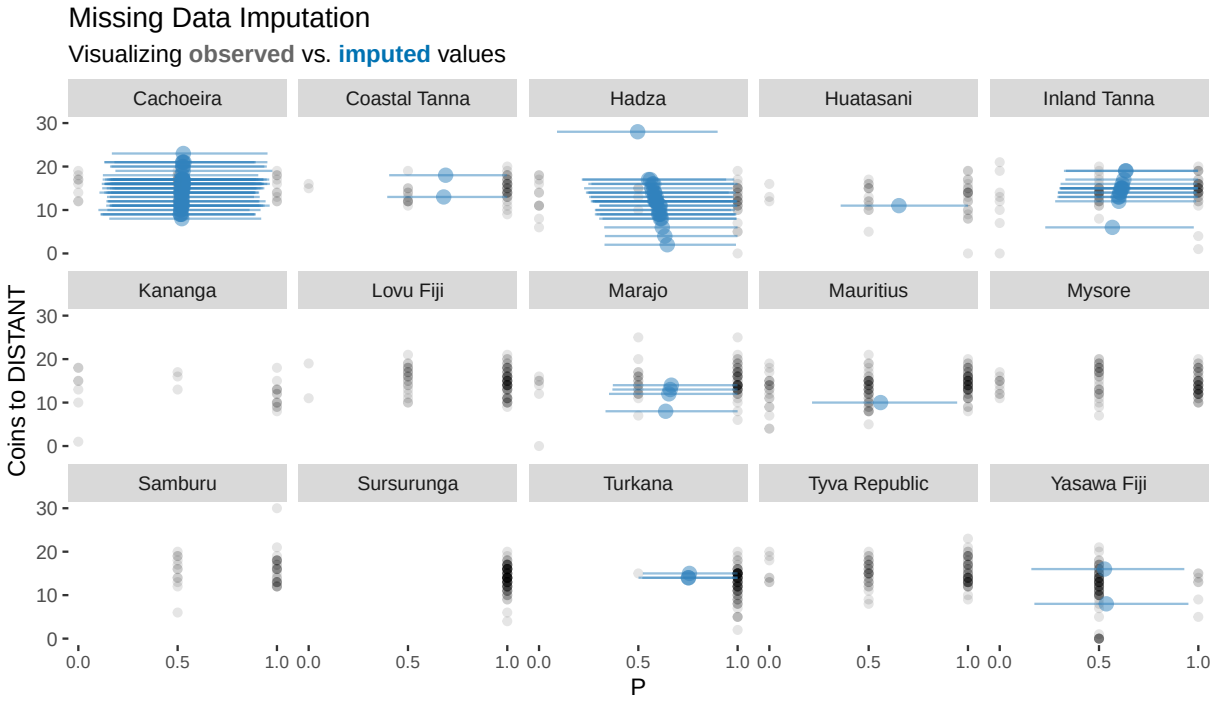

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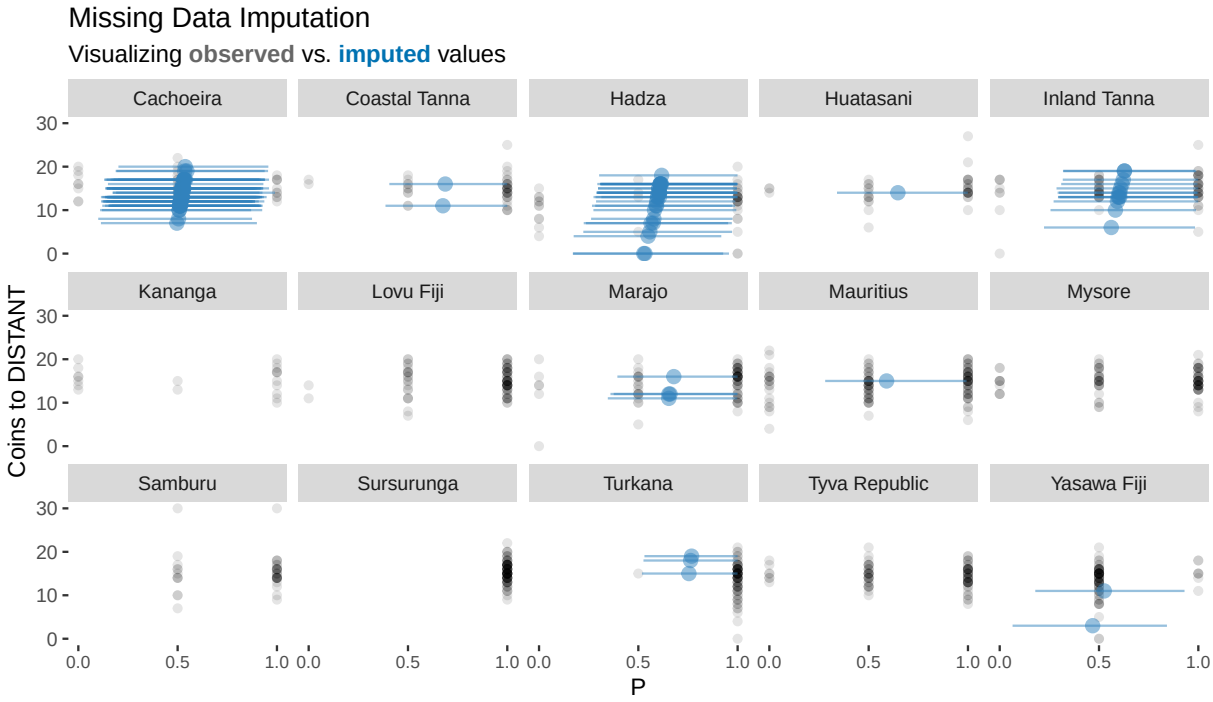

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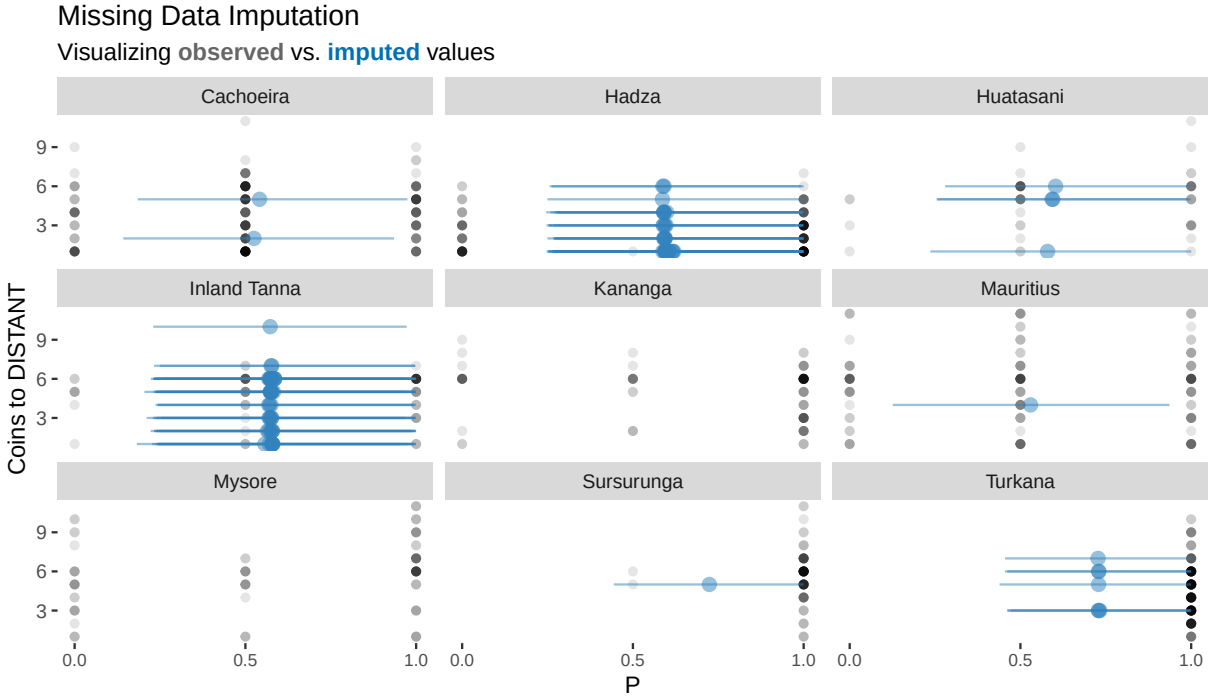

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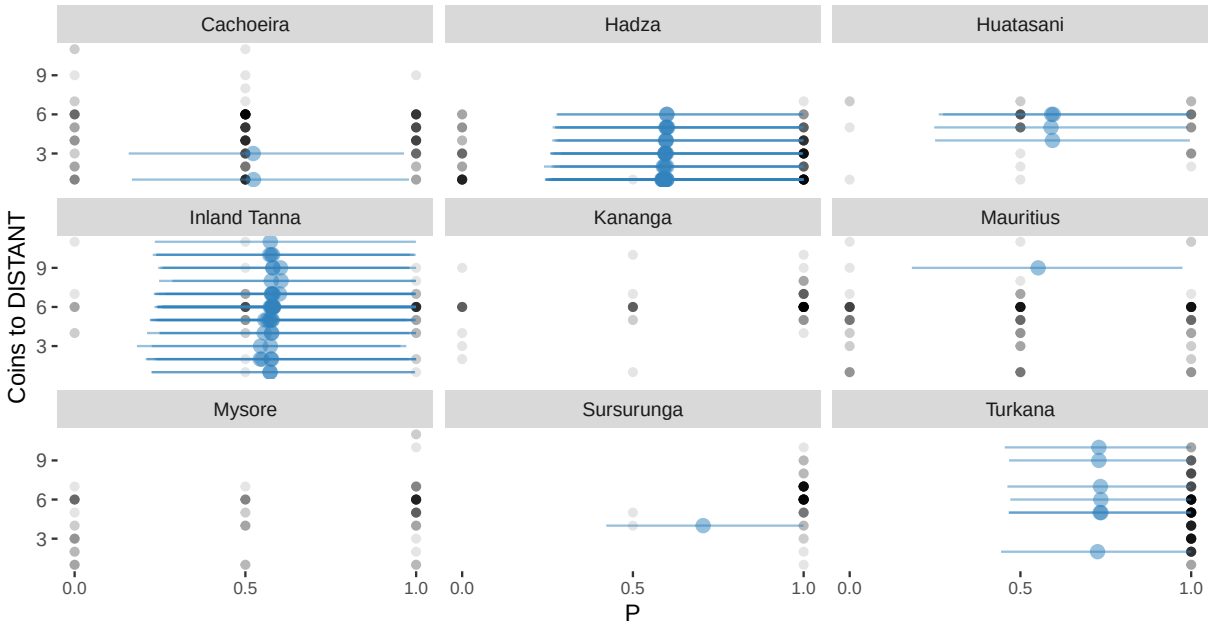

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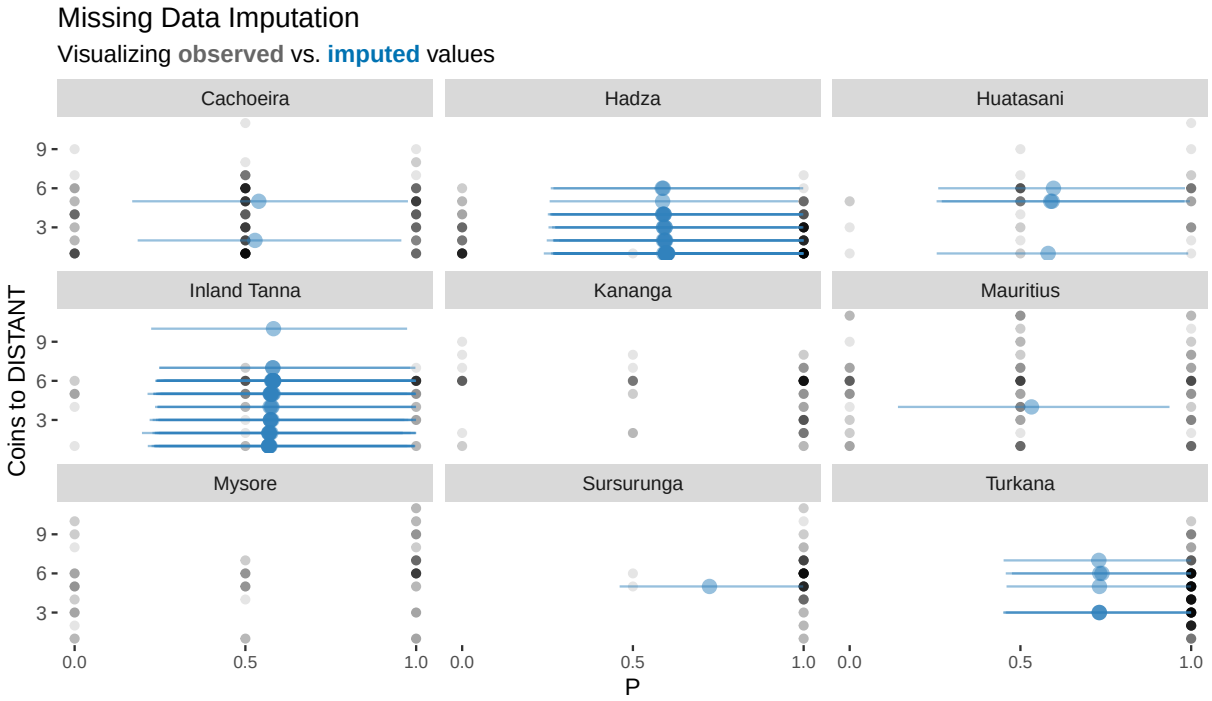

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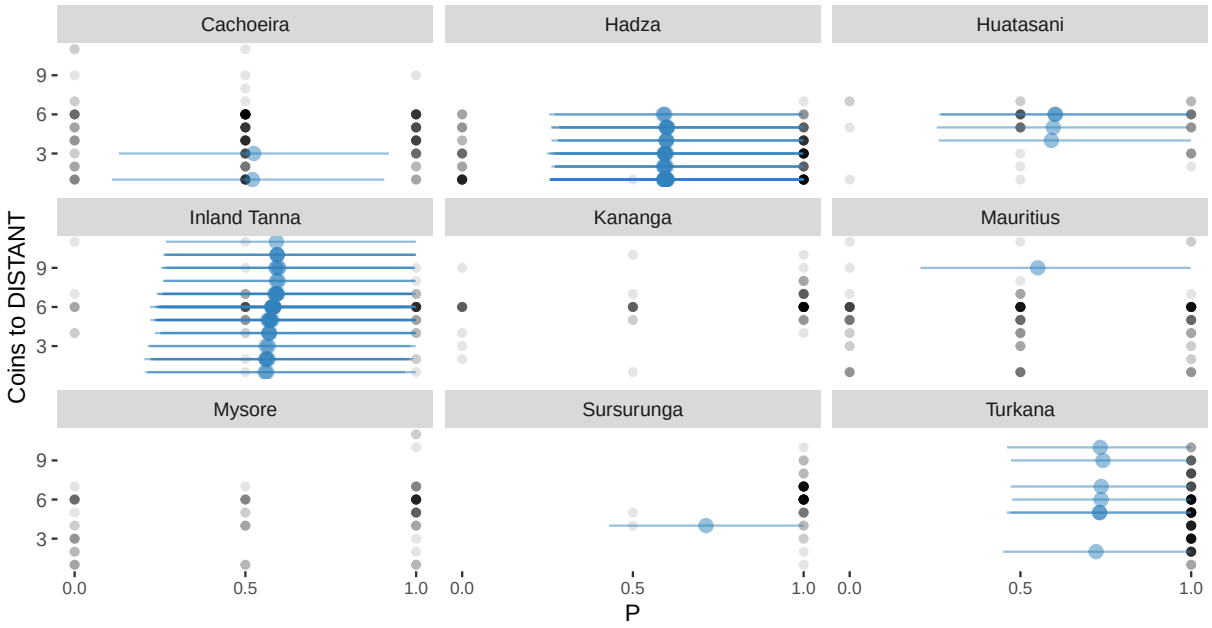

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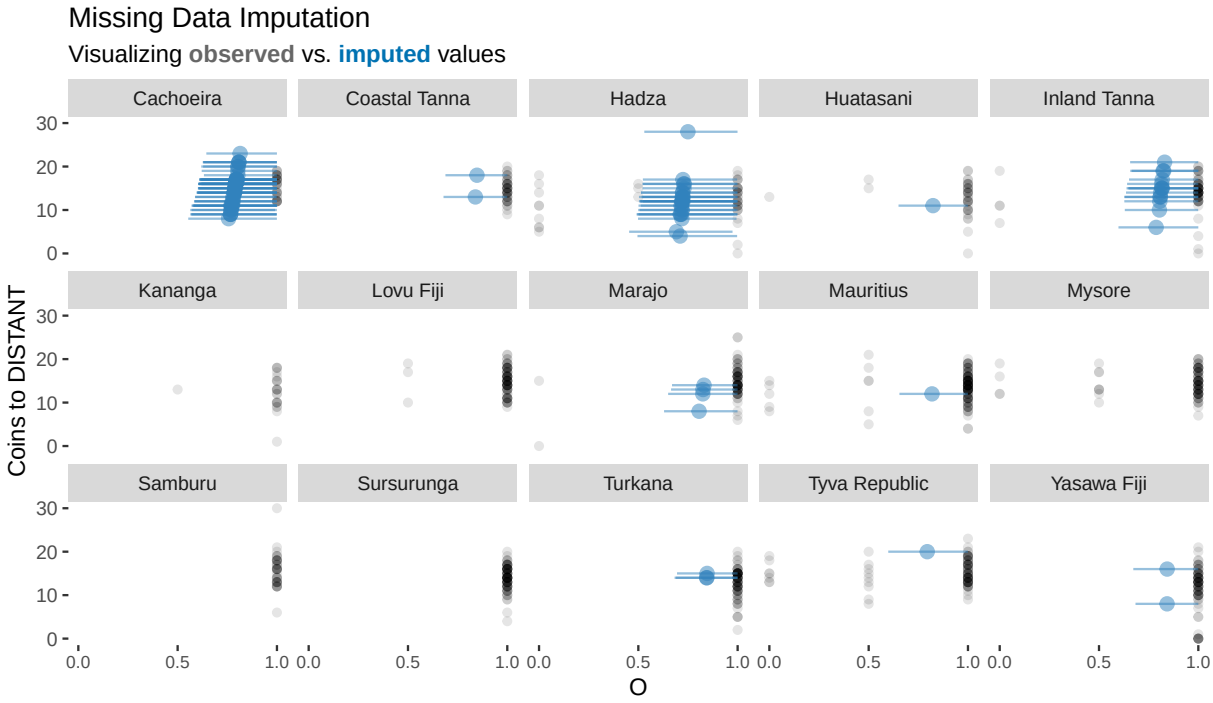

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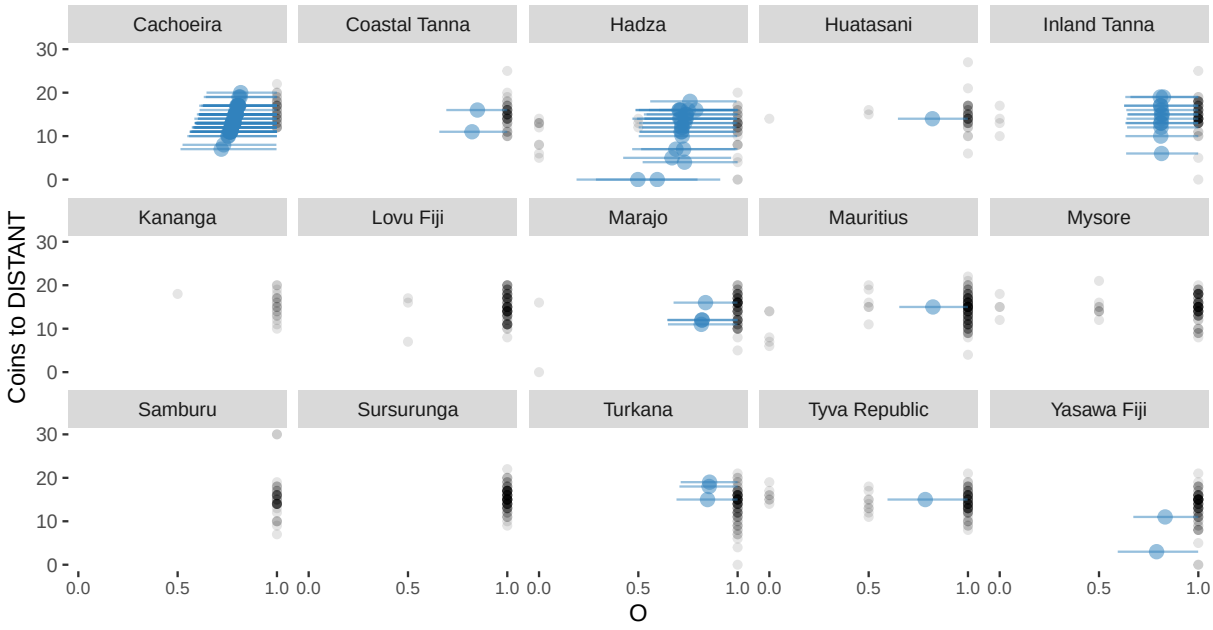

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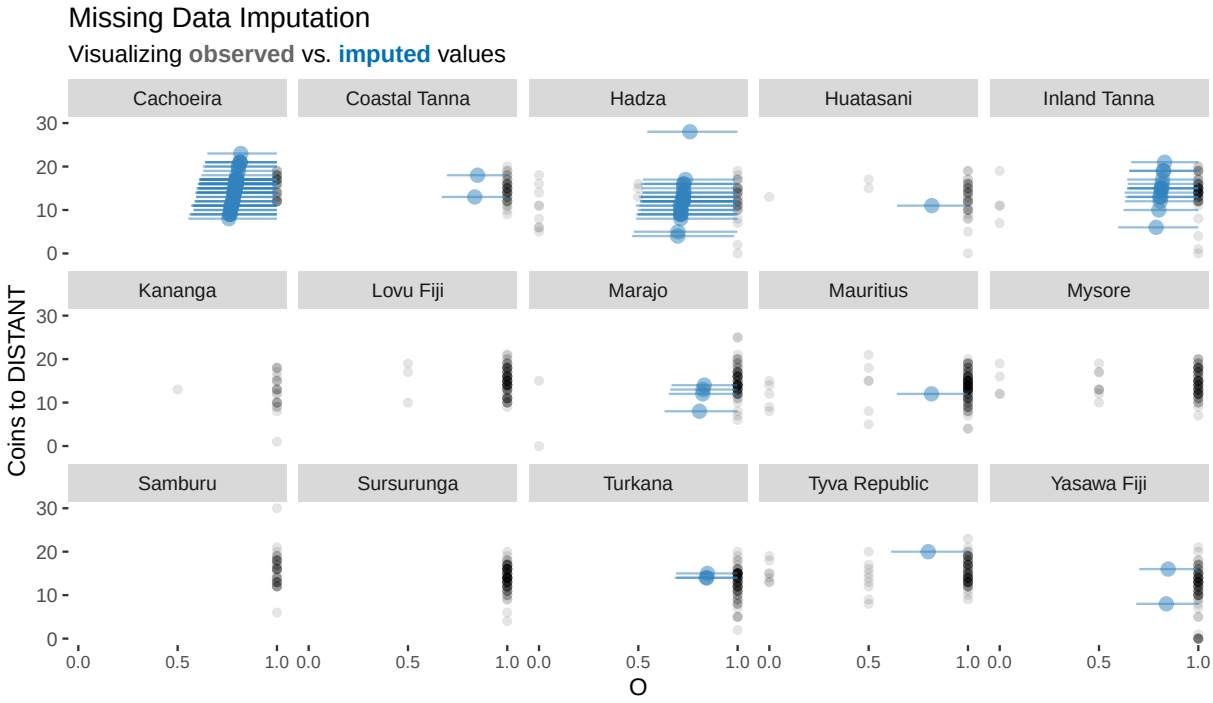

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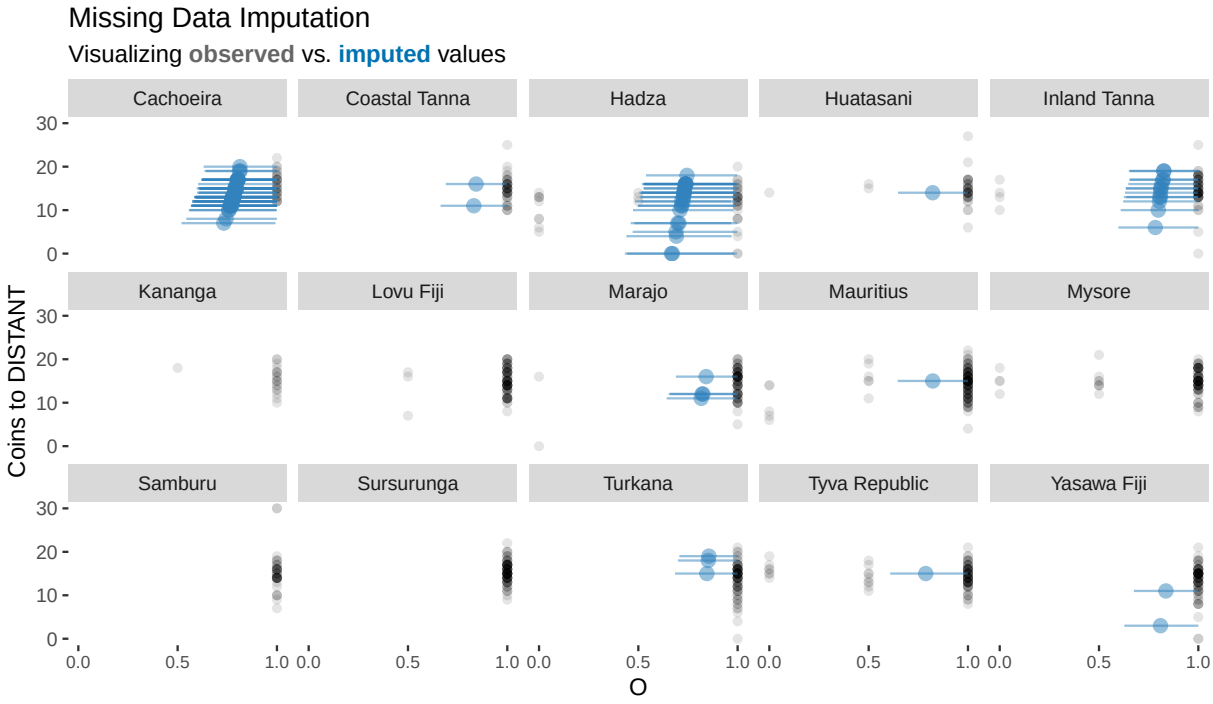

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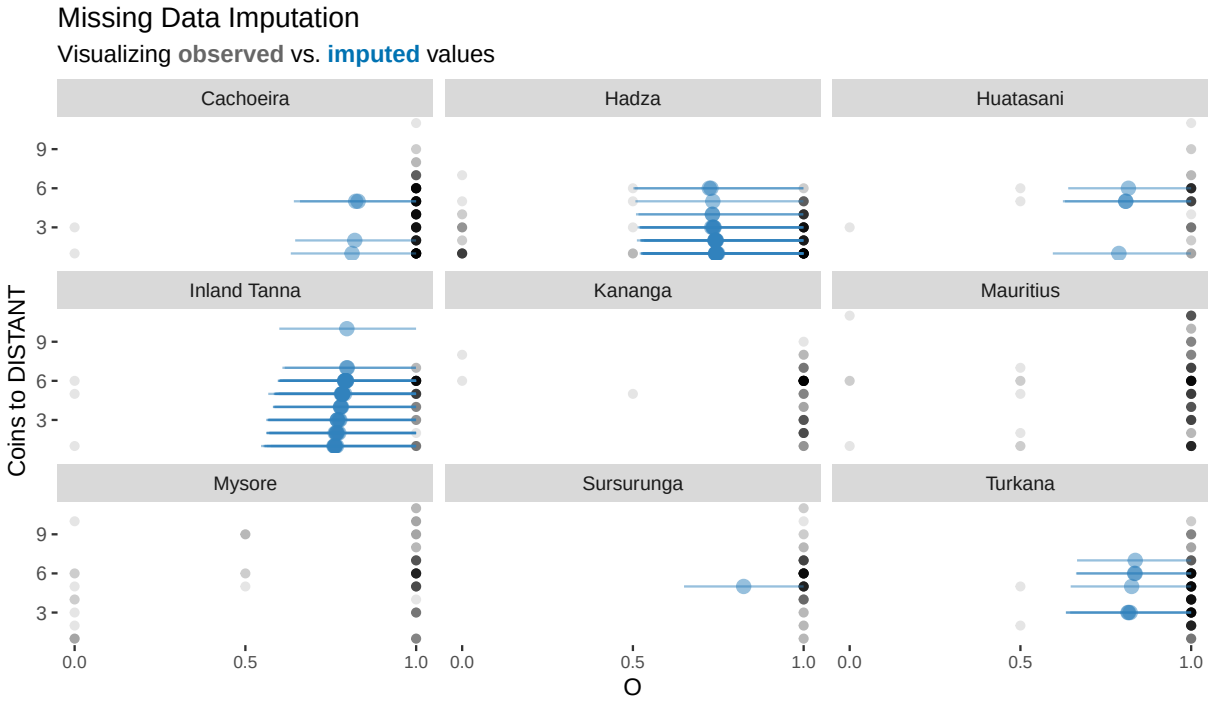

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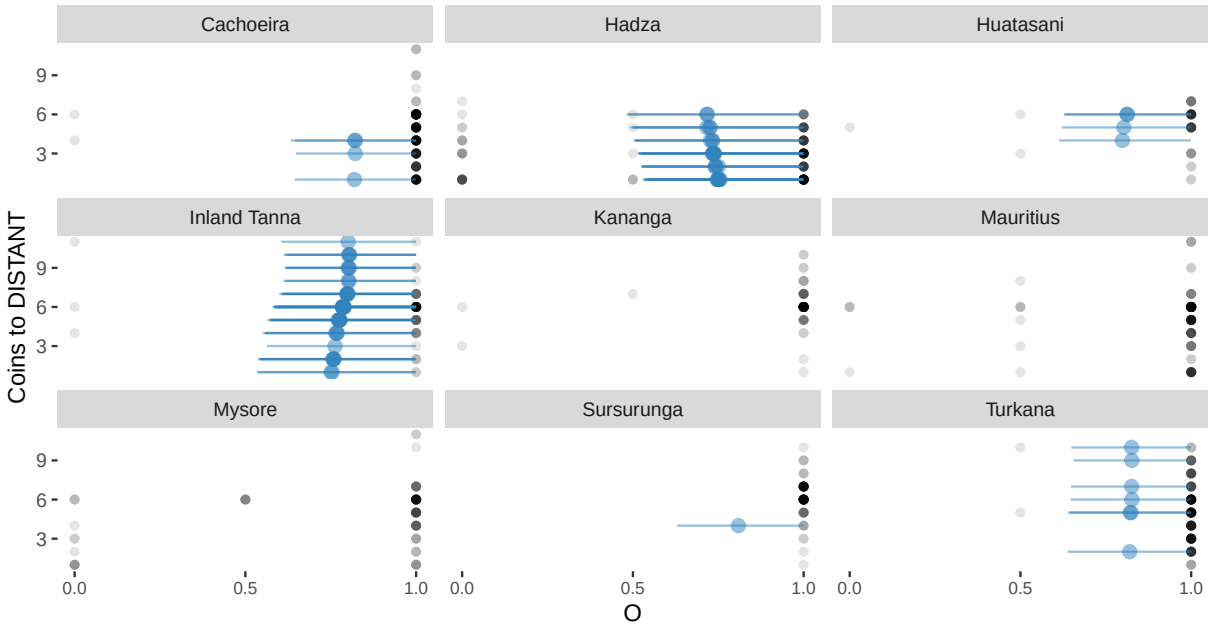

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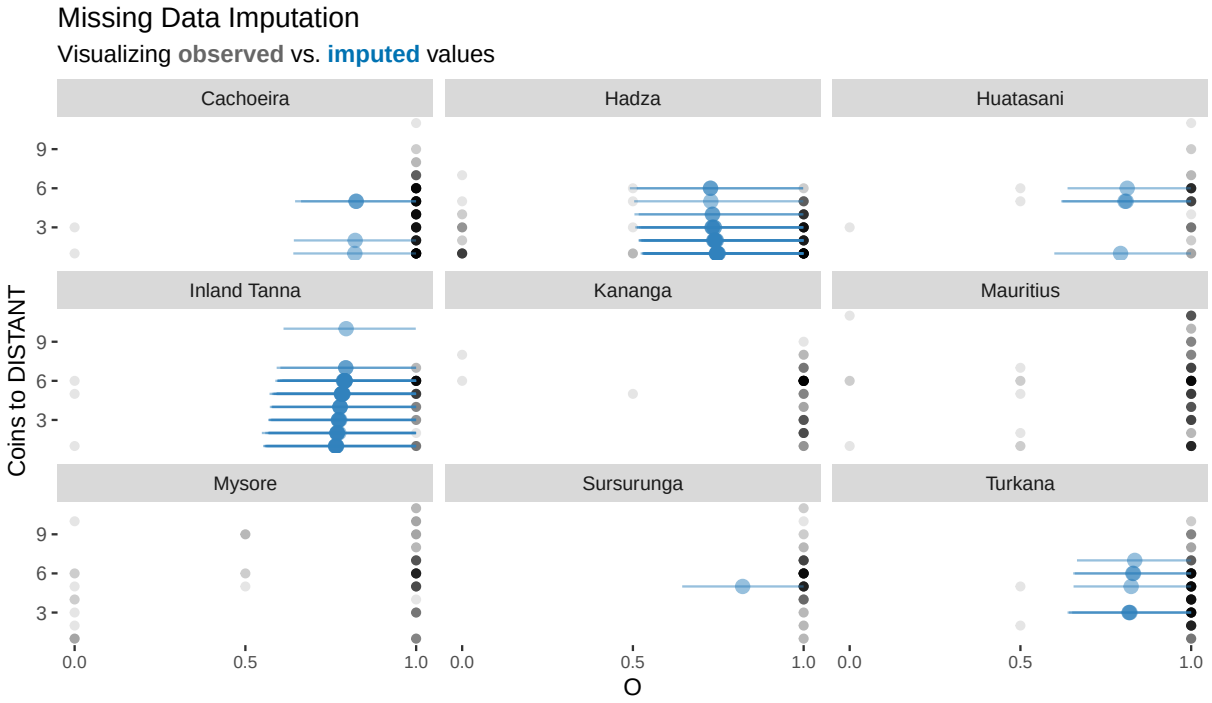

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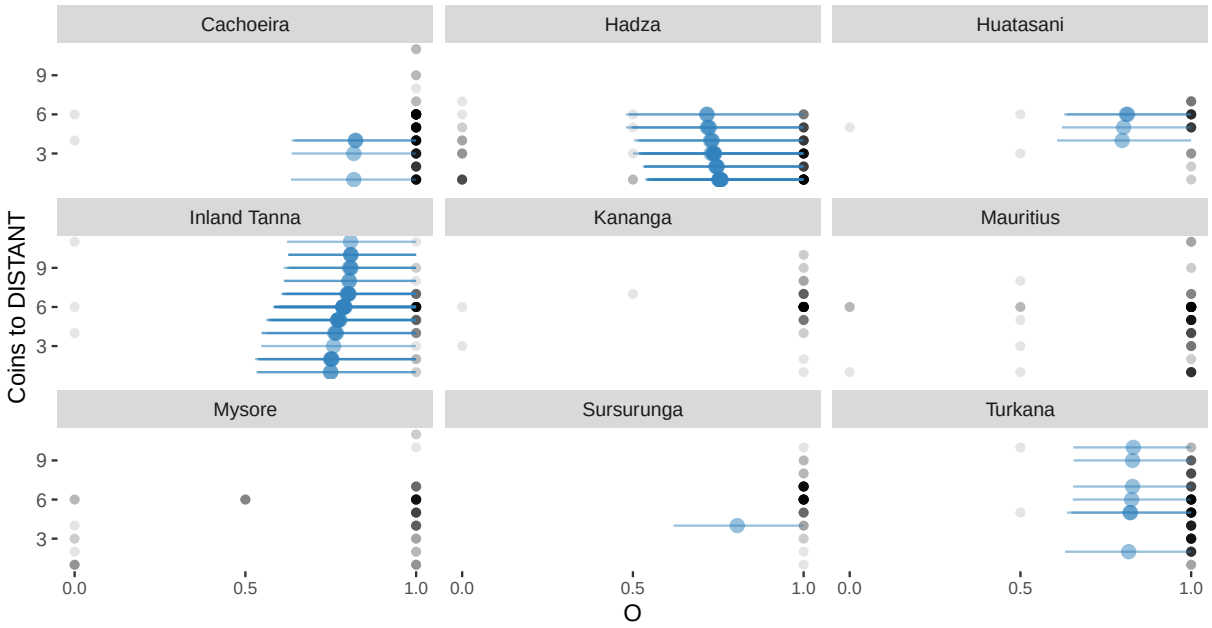

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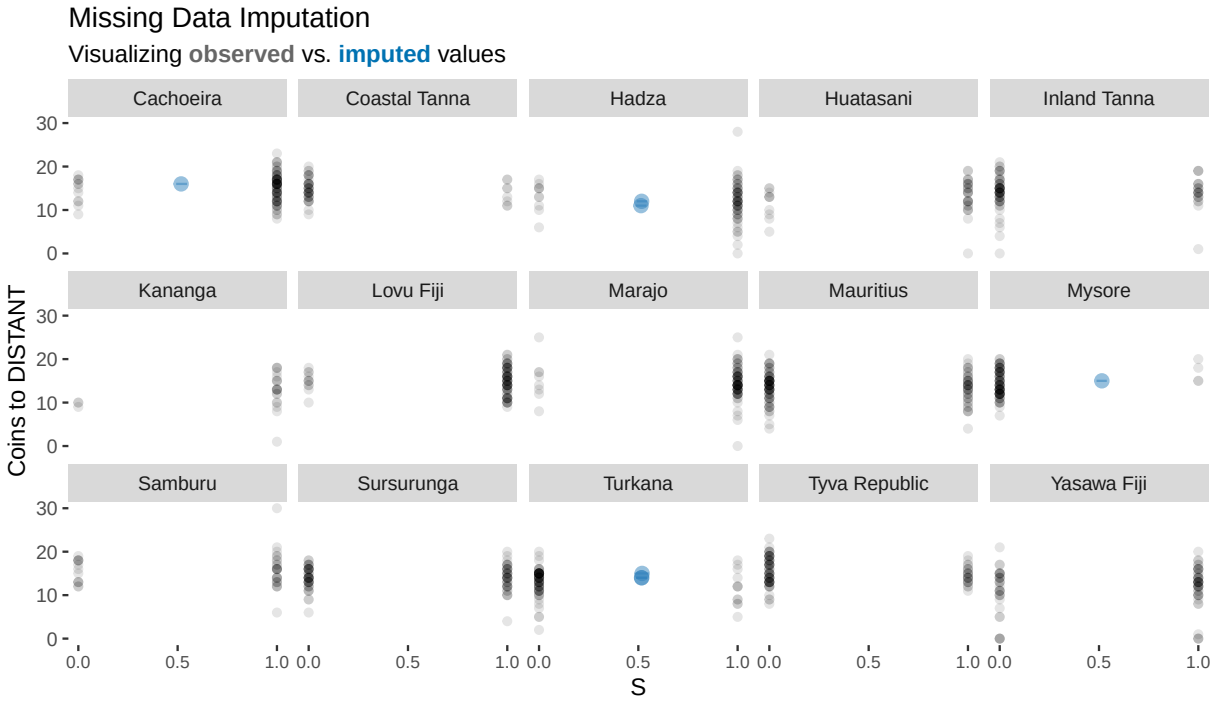

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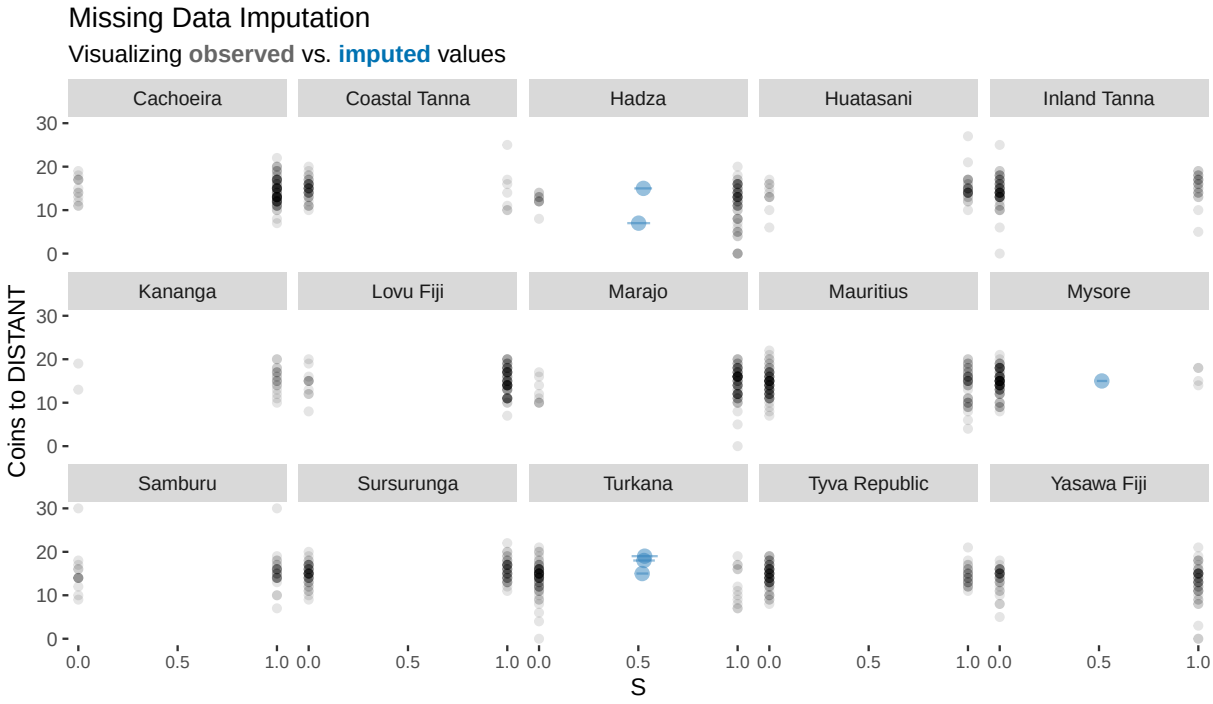

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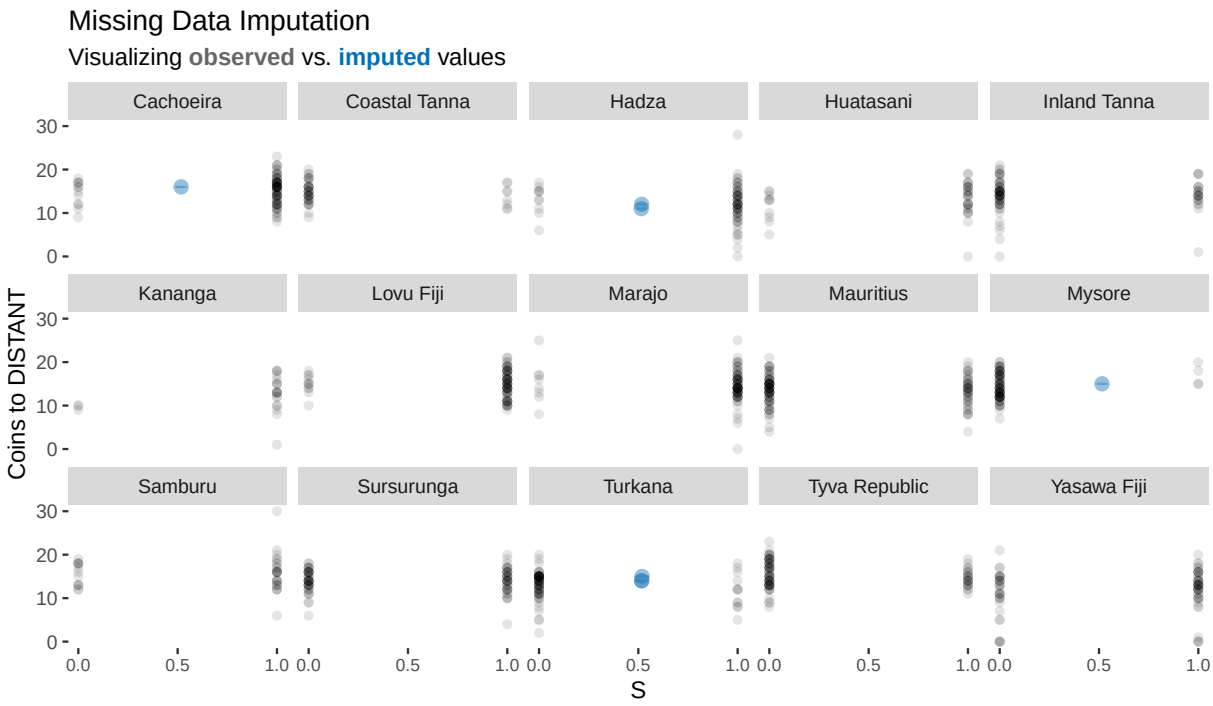

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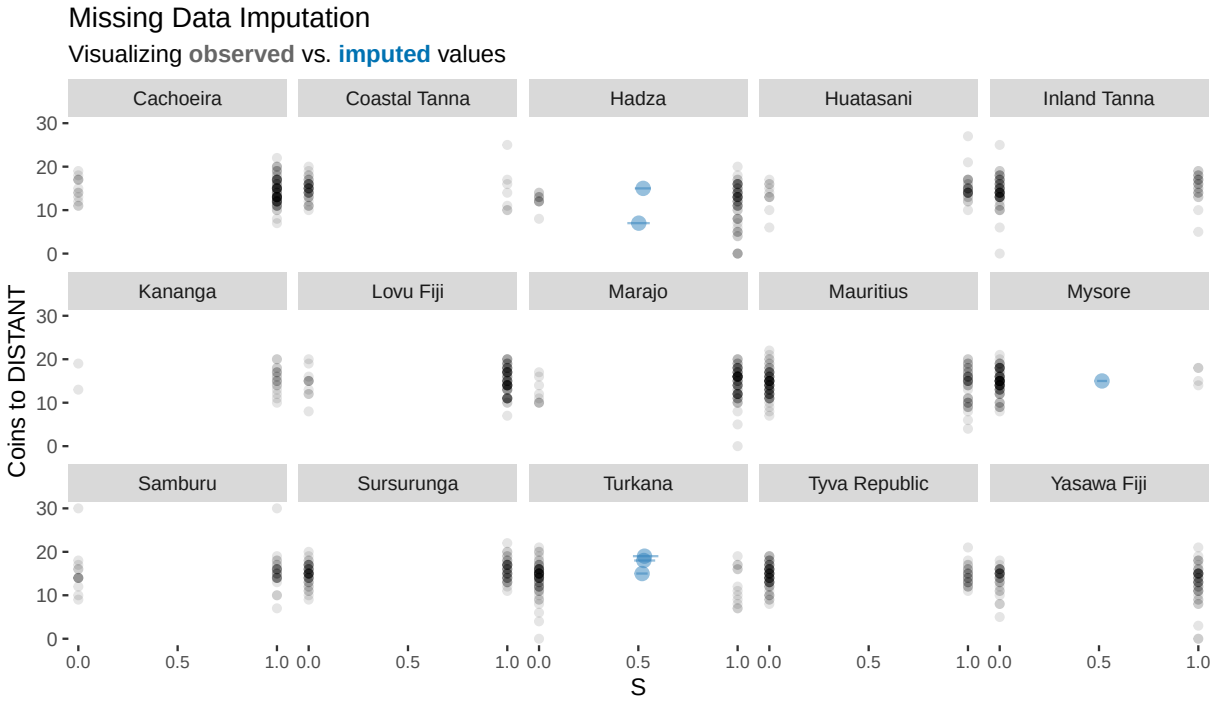

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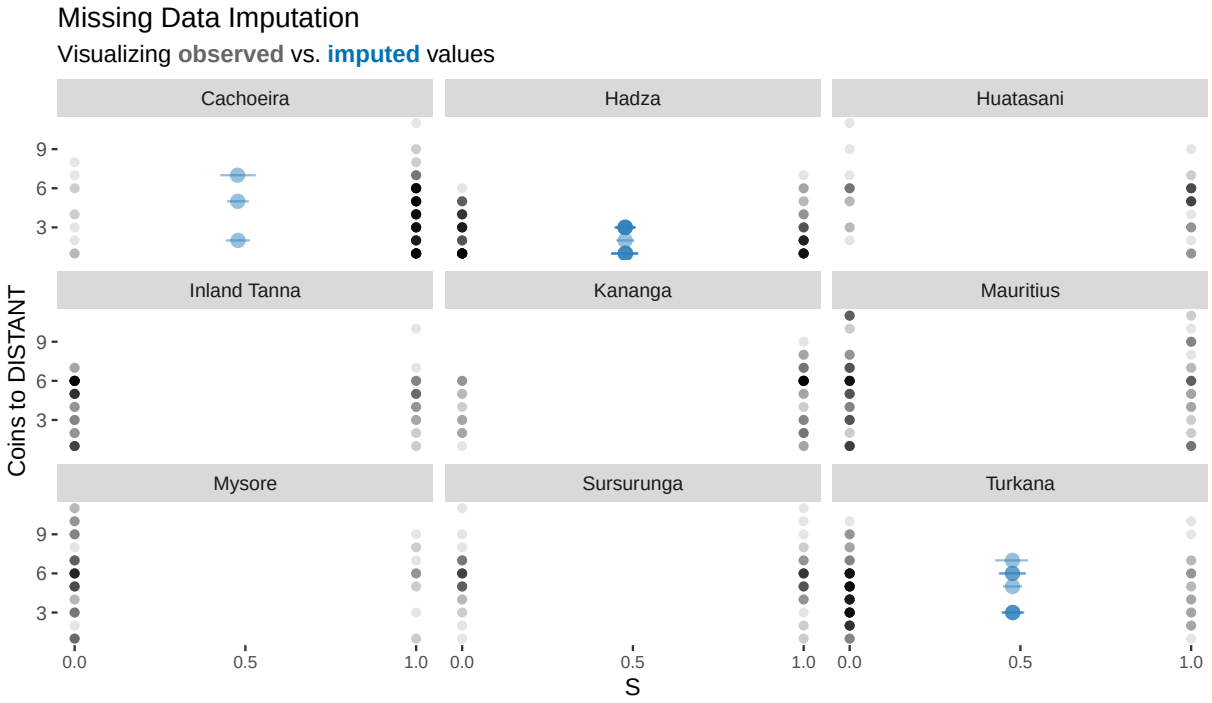

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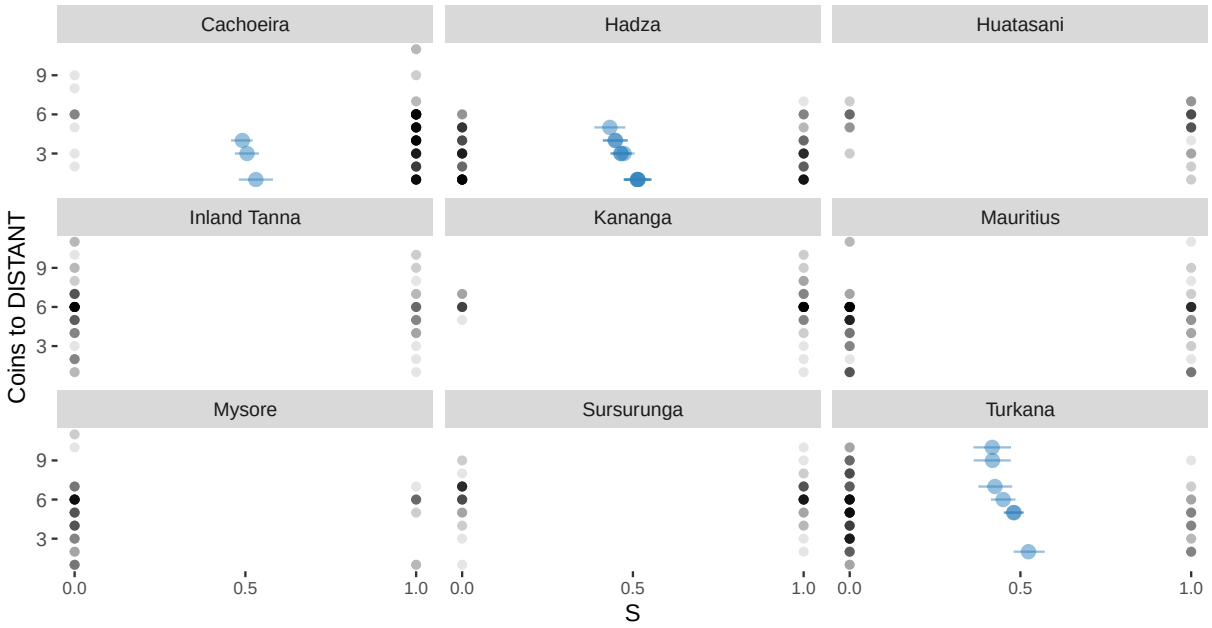

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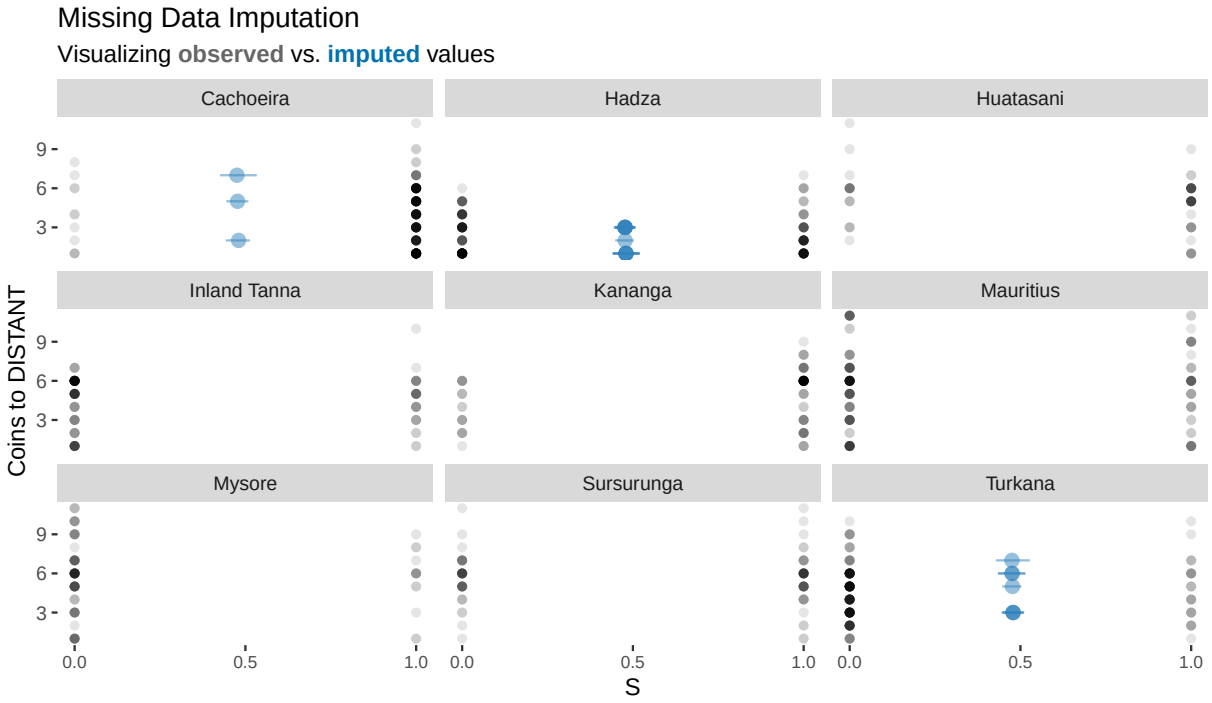

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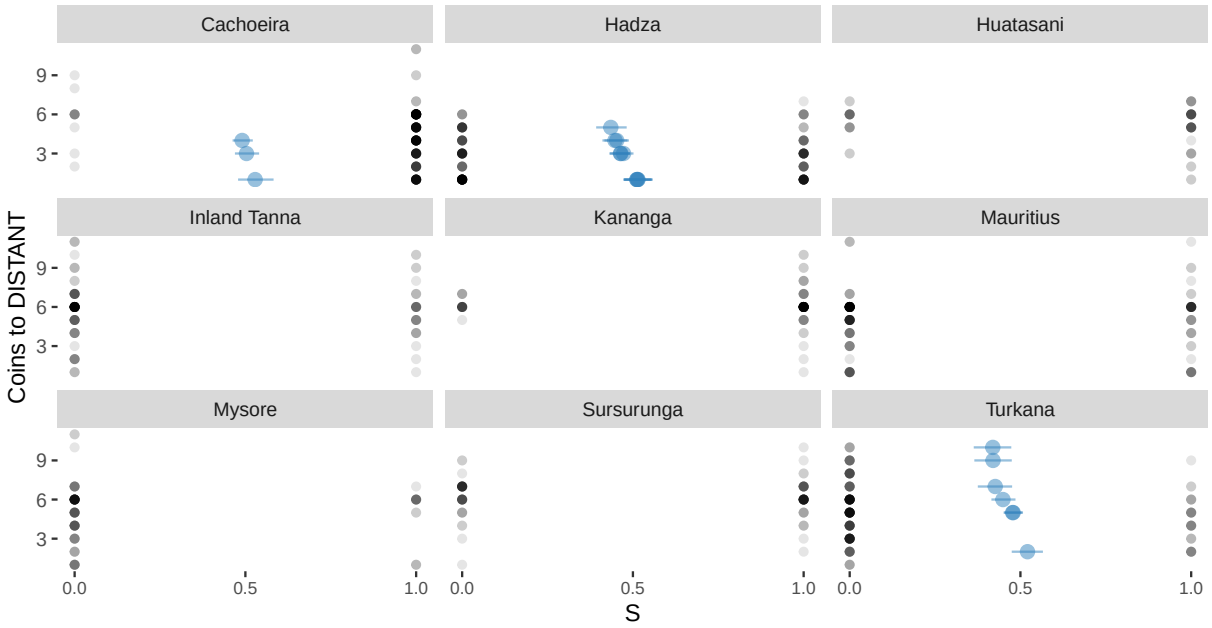

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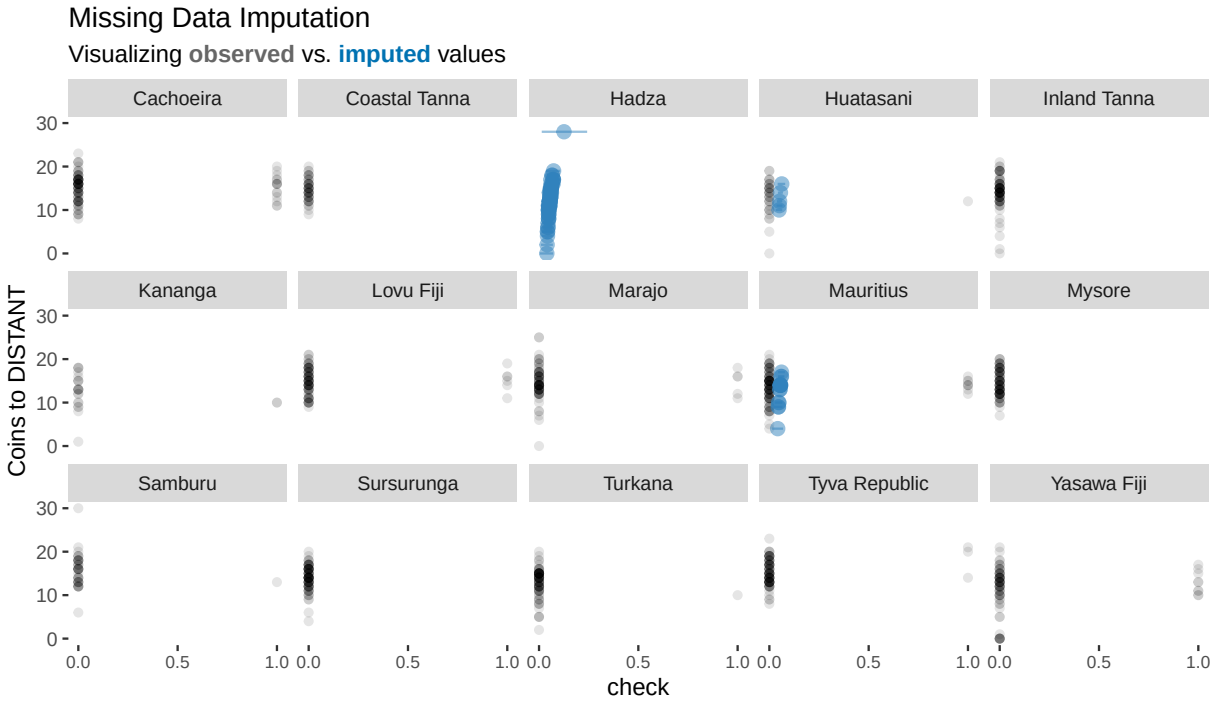

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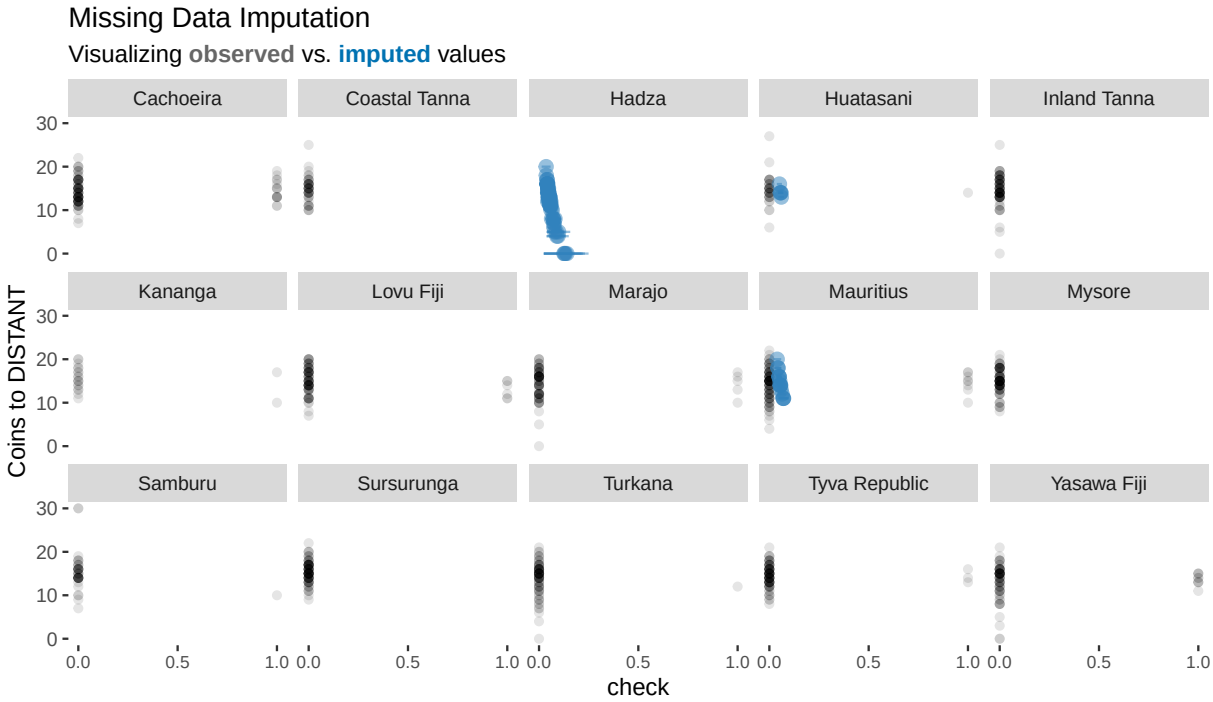

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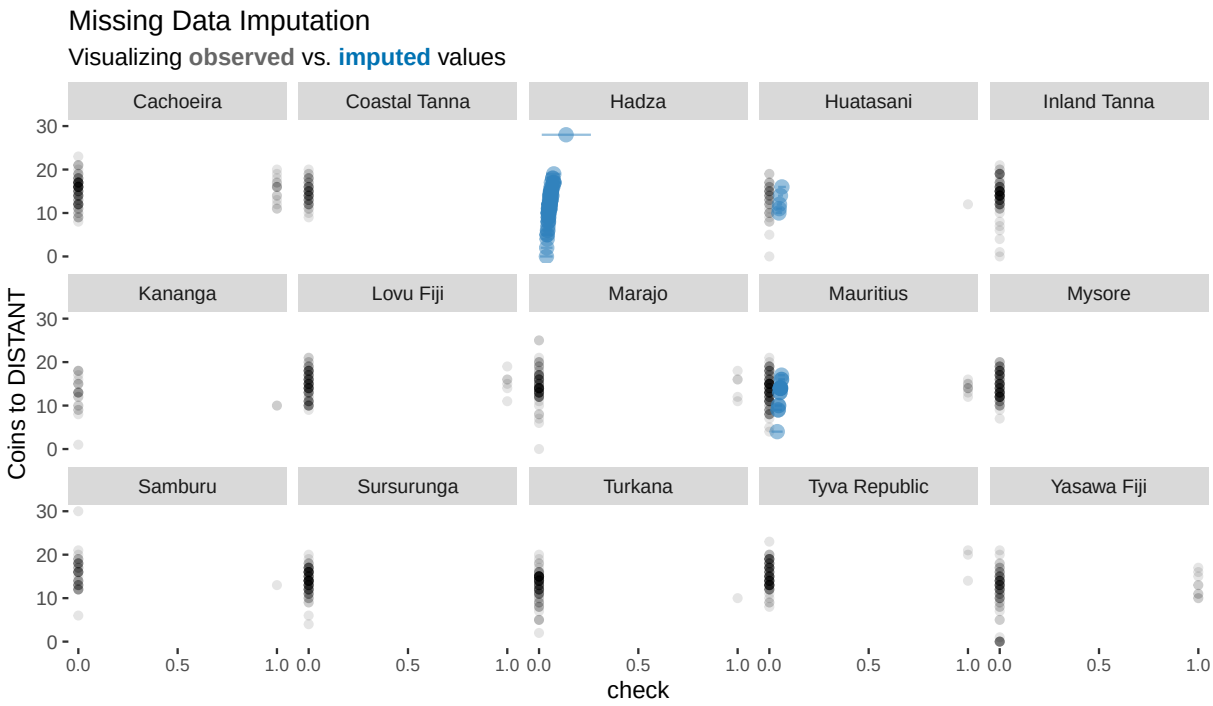

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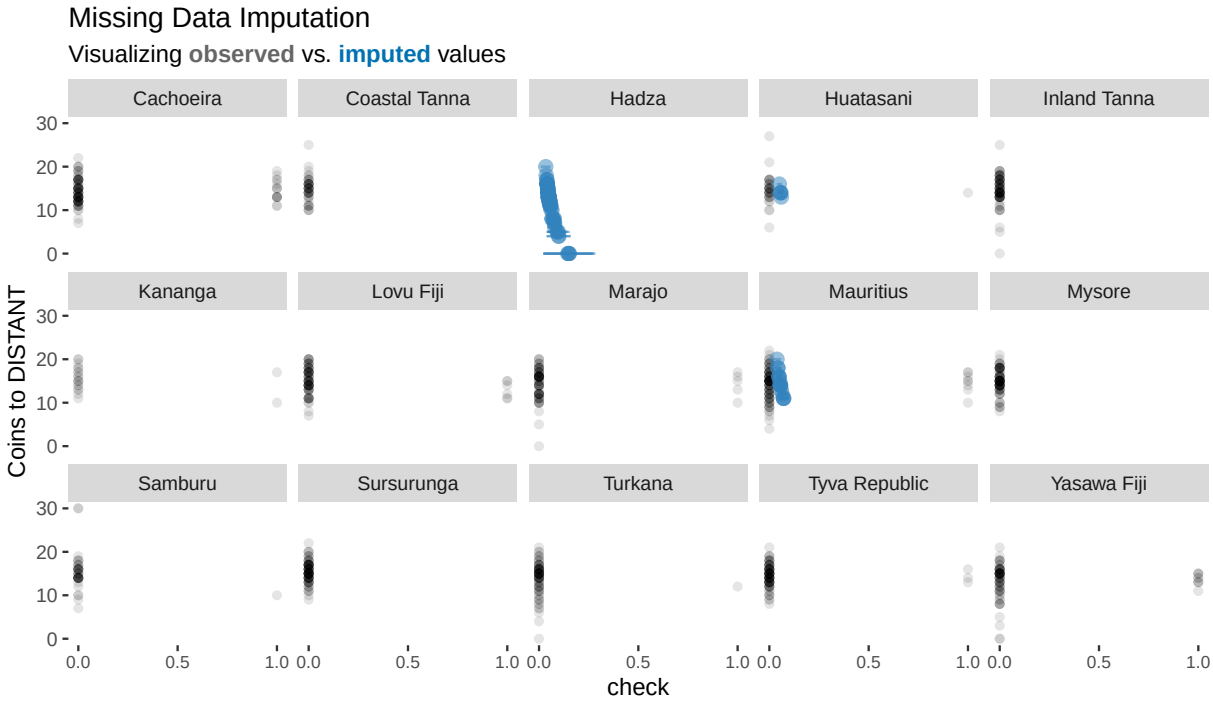

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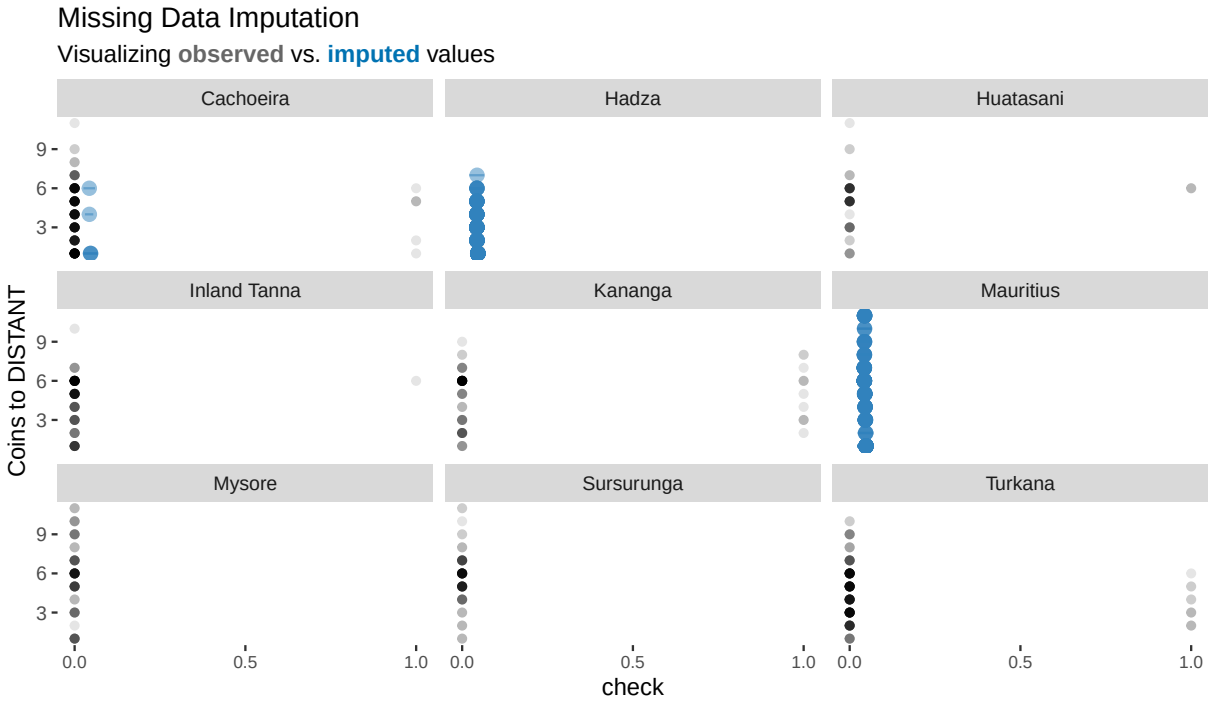

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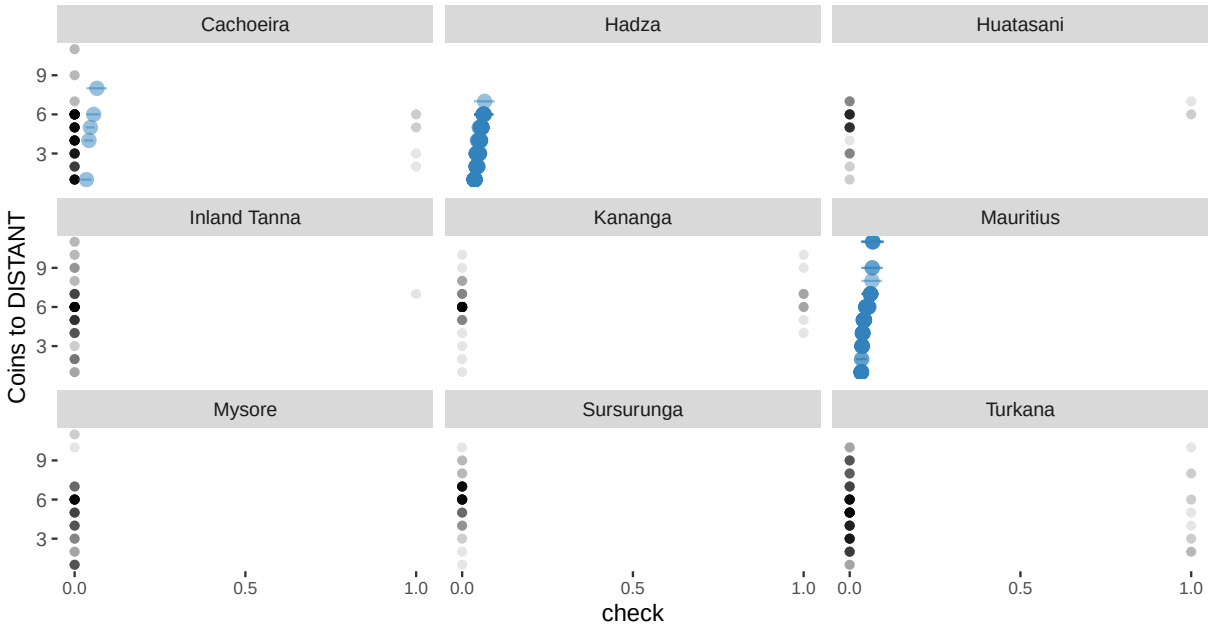

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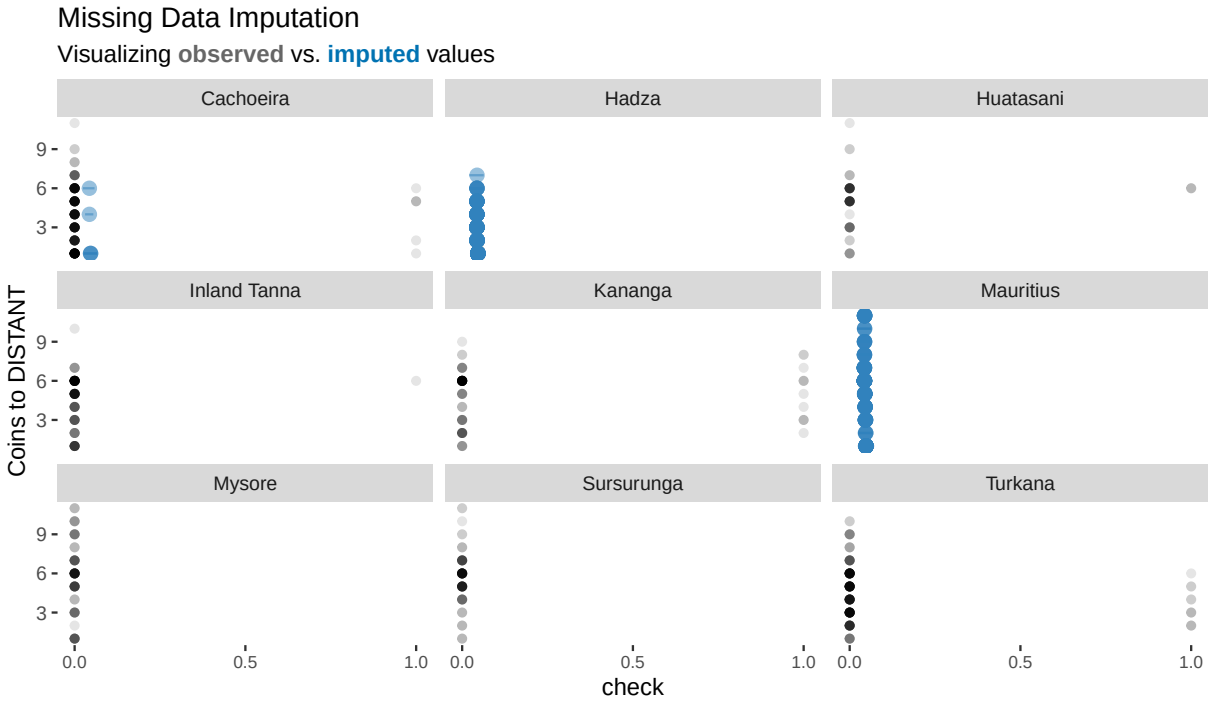

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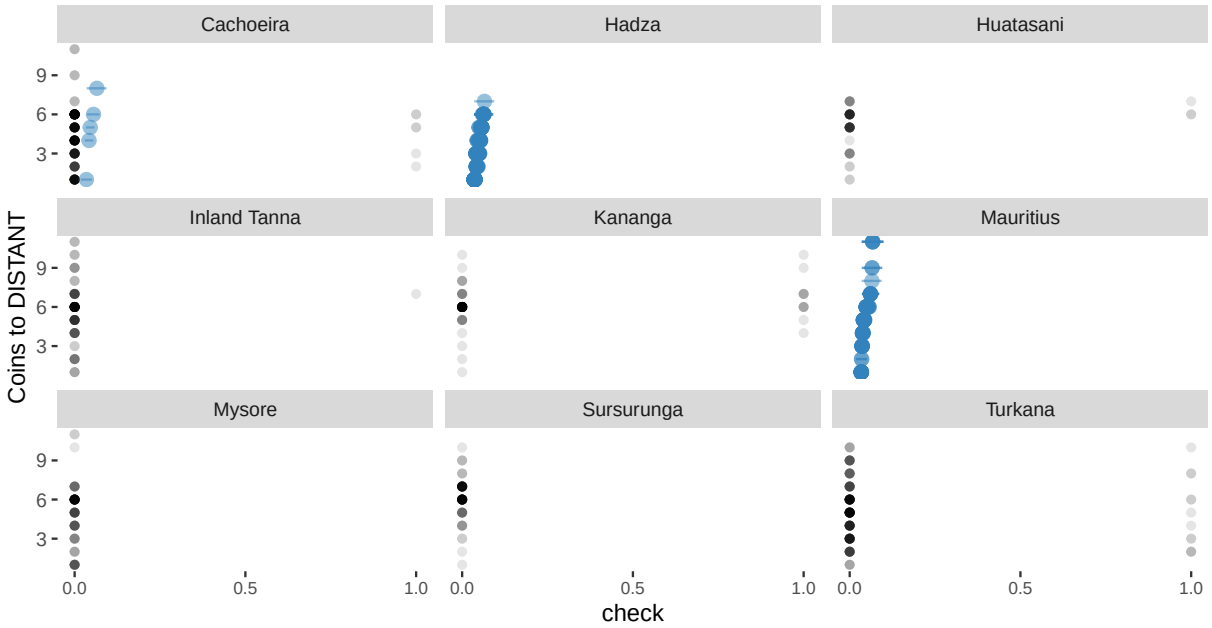

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Imputed values are posterior means and 89% HPDIs.

R packages

We used R version 4.1.2 (R Core Team 2021) and the following R packages: abind v. 1.4.5 (Plate and Heiberger 2016), arrayhelpers v. 1.1.0 (Beleites 2020), backports v. 1.4.1 (Lang and R Core Team 2021), base64enc v. 0.1.3 (Urbanek 2015), bayesplot v. 1.8.1 (Gabry et al. 2019; Gabry and Mahr 2021), bdsmatrix v. 1.3.6 (Therneau 2022), brio v. 1.1.3 (Hester and Csárdi 2021), bslib v. 0.3.1 (Sievert and Cheng 2021a), cachem v. 1.0.6 (Chang 2021a), callr v. 3.7.0 (Csárdi and Chang 2021a), checkmate v. 2.0.0 (Lang 2017), coda v. 0.19.4 (Plummer et al. 2006), colorspace v. 2.0.3 (Zeileis, Hornik, and Murrell 2009; Stauffer et al. 2009; Zeileis et al. 2020), commonmark v. 1.7 (Ooms 2018), cpp11 v. 0.4.2 (Hester and François 2021), curl v. 4.3.2 (Ooms 2021), data.table v. 1.14.2 (Dowle and Srinivasan 2021), desc v. 1.4.0 (Csárdi, Müller, and Hester 2021), diffobj v. 0.3.5 (Gaslam 2021), digest v. 0.6.29 (Antoine Lucas et al. 2021), distributional v. 0.3.0 (O'Hara-Wild, Kay, and Hayes 2022), ellipsis v. 0.3.2 (H. Wickham 2021a), evaluate v. 0.15 (H. Wickham and Xie 2022), fansi v. 1.0.2 (Gaslam 2022), farver v. 2.1.0 (Pedersen, Nicolae, and François 2021), fastmap v. 1.1.0 (Chang 2021b), finalfit v. 1.0.6 (Harrison, Drake, and Ots 2023), fs v. 1.5.2 (Hester, Wickham, and Csárdi 2021), generics v. 0.1.2 (H. Wickham, Kuhn, and Vaughan 2022), GGally v. 2.1.2 (Schloerke et al. 2021), ggdist v. 3.1.1 (Kay 2022a), ggridges v. 0.5.3 (Wilke 2021), ggtext v. 0.1.1 (Wilke 2020a), glue v. 1.6.1 (Hester and Bryan 2022), grateful v. 0.1.11 (Rodríguez-Sánchez, Jackson, and Hutchins 2022), gridExtra v. 2.3 (Auguie 2017), gridtext v. 0.1.4 (Wilke 2020b), gtable v. 0.3.0 (H. Wickham and Pedersen 2019), HDInterval v. 0.2.2 (Meredith and Kruschke 2020), highr v. 0.9 (Xie and Qiu 2021), htmltools v. 0.5.2 (Cheng et al. 2021), isoband v. 0.2.5 (Wilke and Pedersen 2021), jpeg v. 0.1.9 (Urbanek 2021), jquerylib v. 0.1.4 (Sievert and Cheng 2021b), knitr v. 1.39 (Xie 2014, 2015, 2022a), labeling v. 0.4.2 (Justin Talbot 2020), lifecycle v. 1.0.1 (Henry and Wickham 2021), lme4 v. 1.1.28 (Bates et al. 2015), loo v. 2.4.1 (Vehtari, Gelman, and Gabry 2017; Yao et al. 2017; Vehtari et al. 2020), markdown v. 1.1 (Allaire et al. 2019), matrixStats v. 0.61.0 (Bengtsson 2021), memoise v. 2.0.1 (H. Wickham, Hester, et al. 2021), mice v. 3.14.0 (van Buuren and Groothuis-Oudshoorn 2011), mime v. 0.12 (Xie 2021a), minqa v. 1.2.4 (Bates et al. 2014), munsell v. 0.5.0 (C. Wickham 2018), nloptr v. 2.0.0 (Johnson ?), numDeriv v. 2016.8.1.1 (Gilbert and Varadhan 2019), patchwork v. 1.1.1 (Pedersen 2020), pkgconfig v. 2.0.3 (Csárdi 2019), pkgload v. 1.2.4 (H. Wickham, Chang, et al. 2021), plyr v. 1.8.6 (H. Wickham 2011b), png v. 0.1.7 (Urbanek 2013), posterior v. 1.2.0 (Vehtari et al. 2021; Bürkner et al. 2022), praise v. 1.0.0 (Csardi and Sorhus 2015), prettyunits v. 1.1.1 (Csardi 2020), pROC v. 1.18.0 (Robin et al. 2011), processx v. 3.5.2 (Csárdi and Chang 2021b), progress v. 1.2.2 (Csárdi and FitzJohn 2019), ps v. 1.6.0 (Loden et al. 2021), quadprog v. 1.5.8 (Berwin A. Turlach R port by Andreas Weingessel <Andreas.Weingessel@ci.tuwien.ac.at> Fortran contributions from Cleve Moler dpodi/LINPACK) 2019), R6 v. 2.5.1 (Chang 2021c), rappdirs v. 0.3.3 (Ratnakumar, Mick, and Davis 2021), RColorBrewer v. 1.1.2 (Neuwirth 2014), Rcpp v. 1.0.8 (Eddelbuettel and François 2011; Eddelbuettel 2013; Eddelbuettel and Balamuta 2018), RcppEigen v. 0.3.3.9.1 (Bates and Eddelbuettel 2013), rematch2 v. 2.1.2 (Csárdi 2020), renv v. 0.16.0 (Ushey 2022), reshape v. 0.8.9 (H. Wickham 2007a), reshape2 v. 1.4.4 (H. Wickham 2007b), rethinking v. 2.21 (McElreath 2021), rmarkdown v. 2.14 (Xie, Allaire, and Grolemund 2018; Xie, Dervieux, and Riederer 2020; Allaire et al. 2022), rprojroot v. 2.0.2 (Müller 2020), sass v. 0.4.1 (Cheng et al. 2022), scales v. 1.1.1 (H. Wickham and Seidel 2020), stringi v. 1.7.6 (Gagolewski 2021a, 2021b), svUnit v. 1.0.6 (Grosjean 2021), tensorA v. 0.36.2 (van den Boogaart 2020), testthat v. 3.1.2 (H. Wickham 2011a), tidybayes v. 3.0.2 (Kay 2022b), tidyselect v. 1.1.2 (Henry and Wickham 2022), tidyverse v. 1.3.2 (H. Wickham et al. 2019), tinytex v. 0.38 (Xie 2019, 2022b), utf8 v. 1.2.2 (Perry 2021), vctrs v. 0.3.8 (H. Wickham, Henry, and Vaughan 2021), viridisLite v. 0.4.0 (Garnier et al. 2021), waldo v. 0.3.1 (H. Wickham 2021b), withr v. 2.5.0 (Hester et al. 2022), xfun v. 0.29 (Xie 2021b), yaml v. 2.3.5 (Garbett et al. 2022).

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