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COVID-19 lockdown effect in COPD: a comparison of fixed-effects selection methods

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Abstract: Chronic obstructive pulmonary disease (COPD) is common and progressive. One of its major impacts on daily life is decreased functional status which can be assessed by the one-minute sit-to-stand test (1minSTS). The 2020 imposed lockdown due to the recent pandemic (COVID 19) is likely to have influenced the functional status of this population but this is still unknown. Few feature selection algorithms are available for longitudinal data. We aimed to compare different feature selection methods and describe the effect of the COVID-19 lockdown on the 1minSTS behaviour in people with COPD. Data from 59 people with COPD were collected at baseline (B), 34 of whom belonging to the no-lockdown group. 1minSTS was repeated after one (A1) and five months (A5), which corresponded to the assessments prior and after the lockdown in the lockdown group. Fixed-effects were included in different linear mixed-effects models (LMMs) according to the importance given by Random Forests, Boruta, Extreme Gradient Boosting, automatic backward elimination and L1-penalized estimation algorithms. The LMM with the lowest Akaike's information criterion (AIC) was chosen. The LMM obtained by automatic backward elimination achieved the lowest AIC (919.7) and was followed by the one using L1-penalized estimation algorithm (923.5) although this one produced a higher conditional R-squared. Boruta algorithm returned the highest AIC (964.2). Difference between B and A1 number of repetitions in 1minSTS was statistically significant in both COVID-19 groups. No difference was found between A1 and A5 in either group suggesting that the lockdown had no effect in the 1minSTS behaviour.

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