The fundamental properties of the pandemic spread of SARS-CoV-2 have been understood very early. However, it remains difficult to this day to exactly quantify the impact of minute changes in social behaviour — it is a great virtue of free societies that they are very diverse, which at the same time poses extreme challenges on the modelling of pandemic spread under a variety of variable conditions. We have taken on the effort to use a semi-controlled and semi-random social experiment — the UEFA European Soccer Championship 2020, which happened in June and July 2021 — as a laboratory for trying to assign COVID cases to behavioural changes, and in turn to check whether the fundamental parameters governing COVID spread on the long term also apply for predicting the impact of short-term behavioural changes.

Previous studies have generally found inconclusive results or no impact of the UEFA 2020 championship on Covid spread, since they mostly focussed on local infections in the stadium, which are negligible on a national scale. Instead of this approach, we make use of established social habits — the gender imbalance amongst soccer fans, causing an expected asymmetry in COVID infections between genders directly after matches — and the known time structure of matches, where we assume the strongest effect in the countries of the playing parties, and not in the country where the match happens.

We apply a Bayesian analysis modelling the gender asymmetry, the infection and detection delay structure, the weekday-dependent reporting delays, the time-variable underlying gender-symmetric infection dynamics, and including all secondary cases.

The results vary significantly between European countries, which then allows to study the dependence of the UEFA 2020 related infections on the observed infection dynamics in each country.