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COVID-19 lockdown effects on gender inequality: the case of the Italian Astronomy & Astrophysics Community

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Among European countries, Italy was the first to be heavily hit by the outbreak of COVID-19 and quickly decreed on 9 March 2020 that the entire national territory be locked down to prevent its further spread, establishing an unprecedented situation for its citizens, including researchers. Italy hosts a large (~2000) and lively community of researchers in the fields of Astronomy and Astrophysics, which contains the largest fraction of female researchers (~30%) among the world's leading countries in astronomy (defined as the ones with IAU members >150). Therefore, the Italian community poses as an ideal testbed to investigate the consequences of the lockdown on research productivity, also by gender.

In order to do so, we used the INAF and MIUR websites to compile a complete database of the Italian researchers, considered by gender, and matched it with the first authors of preprints posted on the largest preprint archive of natural science publications, arXiv, for each year from 2017 to 2020.

The submission rate over the previous three years is about 38.6 ± 8.2 (one standard deviation, σ) papers per month, with the fraction of papers published by women consistently close to 30%, which well reflects the percentage of women in the community. As expected, the overall production in the first semester of 2020 (i.e. during the first lockdown) was lower than the average value estimated above. But if we break down this difference by the assigned first-author gender, we find that the decrease only concerns the submissions by female researchers, while submissions by male researchers actually increased during the lockdown by up to 10% (or a difference of 3.5σ). We discuss this difference in productivity between male and female researchers during the lockdown as a possible reflection of the unbalanced distribution of the unpaid workload at home between partners.