A study on group bias in healthcare outcomes for nursing home residents during the COVID-19 pandemic in the Basque Country

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We explore the effect of nursing home status in healthcare outcomes such as hospitalisation, mortality and mortality intra-hospital. Amnesty International, among others, claims that in some Autonomous Communities (geopolitical divisions) in Spain elderly people in nursing homes had restrictions in access to hospitals and treatments. Among the general public, this raised an outcry over the fairness of such measures. In this work, the case of the Basque Country is studied under a rigorous statistical approach and a physician's perspective. As fairness/bias is hard to model mathematically and has strong real world implications, this work concentrates on the following simplification: establishing if nursing home status has a direct effect on healthcare outcomes in the presence of other meaningful covariates related to age, patient comorbidity, period of the pandemic, and others. The methods followed here are a combination of established techniques as well as new proposals from the fields of causality and fair learning. The idea behind these methods is as follows: based on the adjustment variables considered, the sample is optimally trimmed so that the groups of residents and non-residents are made as similar as possible. Thus, once the effect of these variables has been mitigated, the impact of nursing home status on healthcare outcomes is studied. The current analysis suggests that as a group, people in nursing homes were significantly less likely to be hospitalised, and considerably more likely to die, even in hospitals, compared to their counterparts during most of the pandemic. Further data collection and analysis is needed to guarantee that this is solely/mainly due to nursing home status.

Keywords: Fairness, Propensity scoring, Causality.