association in observational studies but the extent to which this occurs in studies of SARS-CoV-2 infection/COVID-19 severity is not well established.

Methods: Using ALSPAC and UK Biobank we investigated pre-pandemic predictors of selection (i.e. having data on SARS-CoV-2 infection and COVID-19 severity from self-report and/or health record linkage). We conducted empirical analyses and simulations to explore the potential presence, direction and magnitude of bias due to selection when estimating the association of BMI with SARS-CoV-2 infection and COVID-19 severity.

Results: A broad range of characteristics related to selection in both cohorts, sometimes in opposite directions. We found bias in all simulated scenarios, mostly of small magnitude. Both the direction and magnitude of bias was influenced by the presence of an effect of BMI on SARS-CoV-2 infection and COVID-19 severity and the control group definition used (e.g. assuming no effect of BMI on SARS-CoV-2 infection our main simulation showed bias equivalent to an estimated odds ratio of 0.99 when using non-infected controls but 1.16 when using controls combining non-infected and non-assessed).

Conclusions: Despite small amounts of bias in most scenarios, a control group definition including those non-assessed (e.g. non-tested) can induce more bias. In large samples such as UK Biobank the statistical power means incorrect conclusions could be made.

Key messages: Observational studies estimating associations of factors with SARS-CoV-2 or COVID-19 may be biased due to non-random selection into the analytic sample.

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Selection bias in COVID-19 research: Prospective analyses of two UK cohort studies

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