1   **Title:** The 2020 SARS-CoV-2 epidemic in England: key epidemiological drivers and impact

2   of interventions

3   **Short title:** Epidemiology of SARS-Cov-2 in England

4   **One-sentence summary:** We fit a model to surveillance data, to estimate SARS-CoV-2

5   transmissibility and severity, and the impact of interventions.

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28 **Abstract**

29 England has been severely affected by COVID-19. We fitted a model of SARS-CoV-2

30 transmission in care homes and the community to regional 2020 surveillance data. Only

31 national lockdown brought the reproduction number below 1 consistently; introduced one

32 week earlier in the first wave it could have reduced mortality by 23,300 deaths on average.

33 The mean infection fatality ratio was initially ~1.3% across all regions except London and

34 halved following clinical care improvements. The infection fatality ratio was two-fold lower

35 throughout in London, even when adjusting for demographics. The infection fatality

36 ratio in care homes was 2.5-times that in the elderly in the community. Population-level

37 infection-induced immunity in England is still far from herd immunity, with regional mean

38 cumulative attack rates ranging between 4.4% and 15.8%.