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Supplementary appendix

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Changes in symptomatology, re-infection and transmissibility associated with SARS-CoV-2 variant B.1.1.7: an ecological study

Supplementary appendix

Supplementary Figures	2
Figure S1. Symptom reporting against proportion of B.1.1.7.	2
Figure S2. Hospitalisation, asymptomatics, long duration and total symptoms against time.	3
Figure S3. Hospitalisation, asymptomatics, long duration and total symptoms against proportion of B.1.1.7.	4
Figure S4. Incidence and R(t) using SGTF data.	5
Figure S5. Associations between symptom reports and B.1.1.7.	6
Figure S6. Incidence and R(t) for all regions, extended to 15 January 2021.	7
Supplementary Tables	8
Table S1. Coefficients for association between B.1.1.7 and asymptomatic infection, long duration, hospital reports, number of symptoms.	8
Table S2. Regional reinfection rates and correlation between reinfection and B.1.1.7 / total cases.	9
Table S3. Comparison of correlation between reinfection and B.1.1.7 / total cases.	10
COG-UK authorship list	11

Supplementary Figures

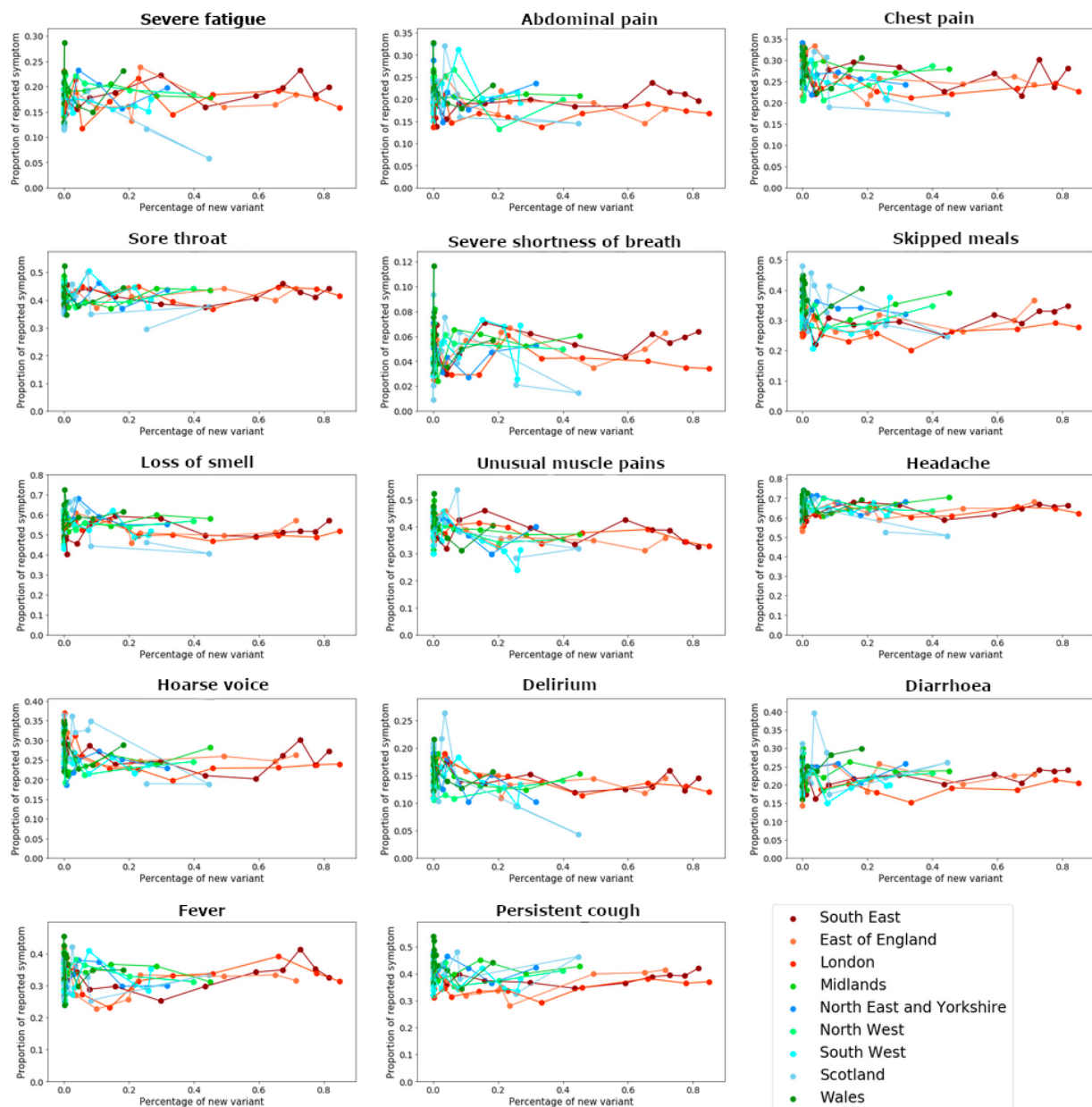


Figure S1. Symptom reporting against proportion of B.1.1.7.

Regional plots of the proportion of users with positive tests reporting each symptom, against the proportion of B.1.1.7. Drop in fever reporting in early November was caused by a change in the question wording; this wording was subsequently reverted a week later.

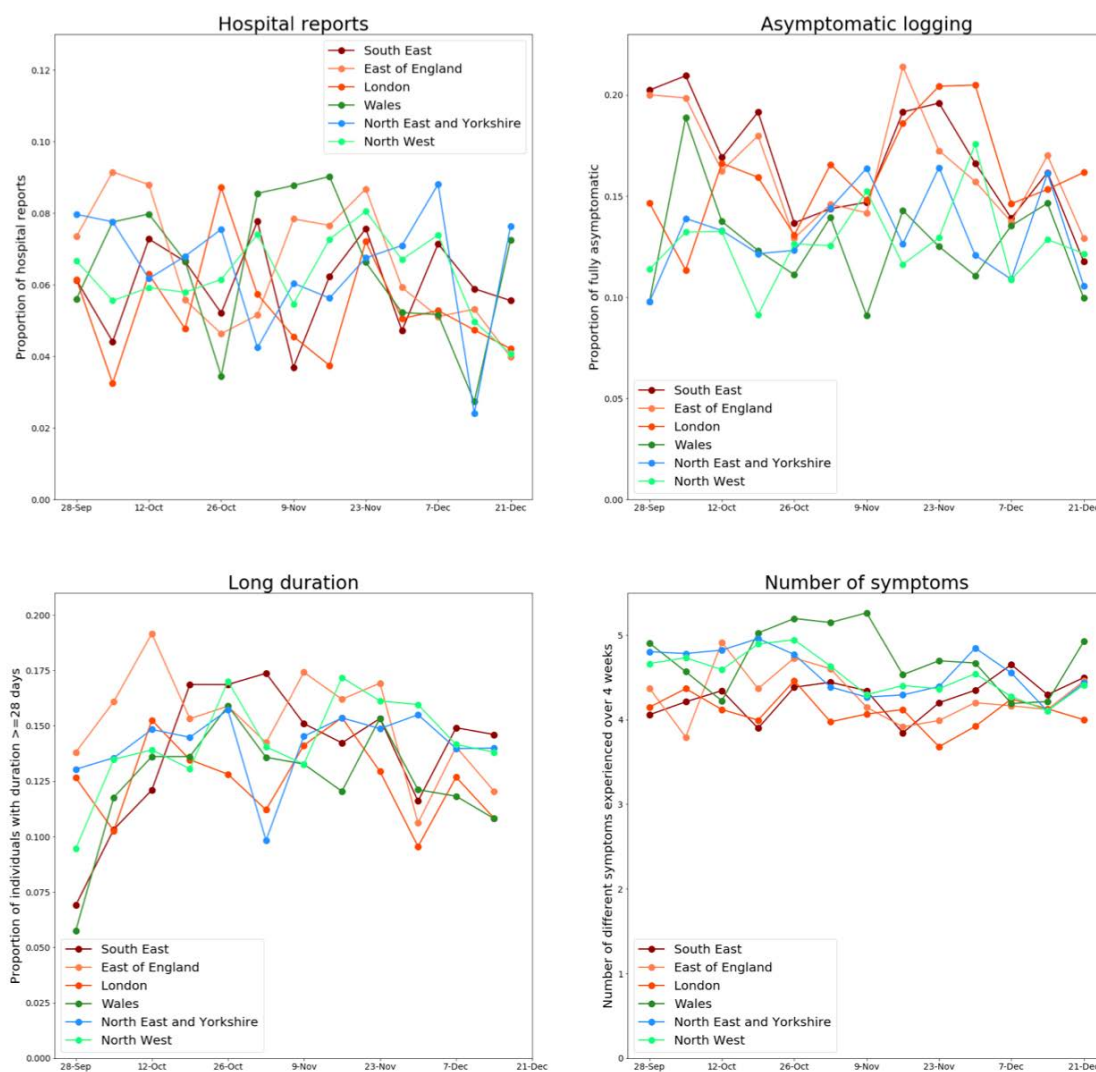


Figure S2. Hospitalisation, asymptomatics, long duration and total symptoms against time.

Regional plot of hospitalisation reports, proportion of asymptomatic positives, instances of long symptom duration and the total number of different experienced symptoms against time. For the study of long symptom duration, tests are only considered up to 21 December, and symptom reports up to 18 January 2021 to limit right censoring effects. Only symptomatic individuals for which duration can be ascertained are included.

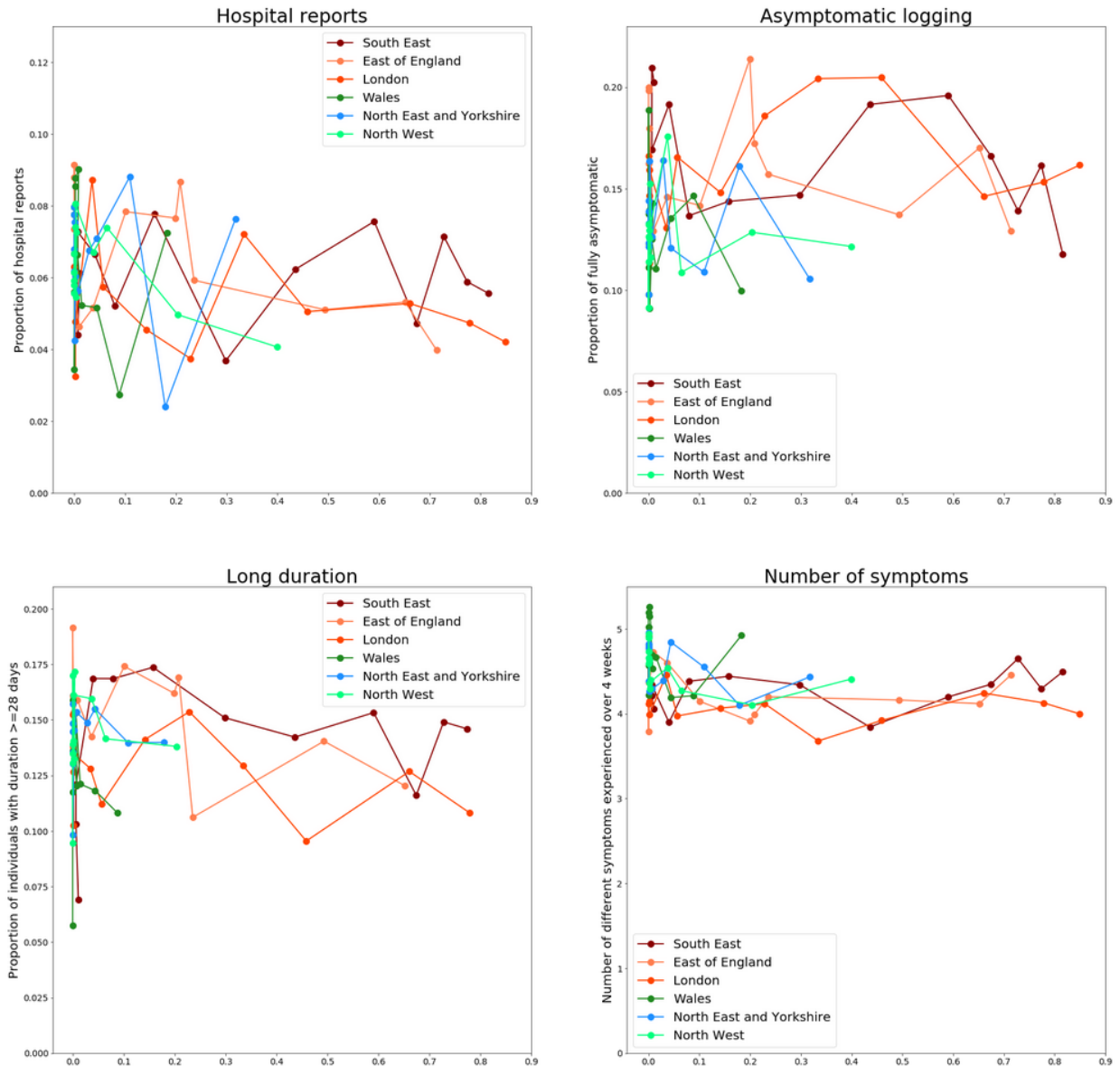


Figure S3. Hospitalisation, asymptomatics, long duration and total symptoms against proportion of B.1.1.7.

Regional plot of hospitalisation reports, proportion of asymptomatic positives, instances of long symptom duration and the total number of different experienced symptoms against proportion of B.1.1.7. For the study of long symptom duration, tests are only considered up to 21 December, and symptom reports up to 18 January 2021 to limit right censoring effects. Only symptomatic individuals for which duration can be ascertained are included.

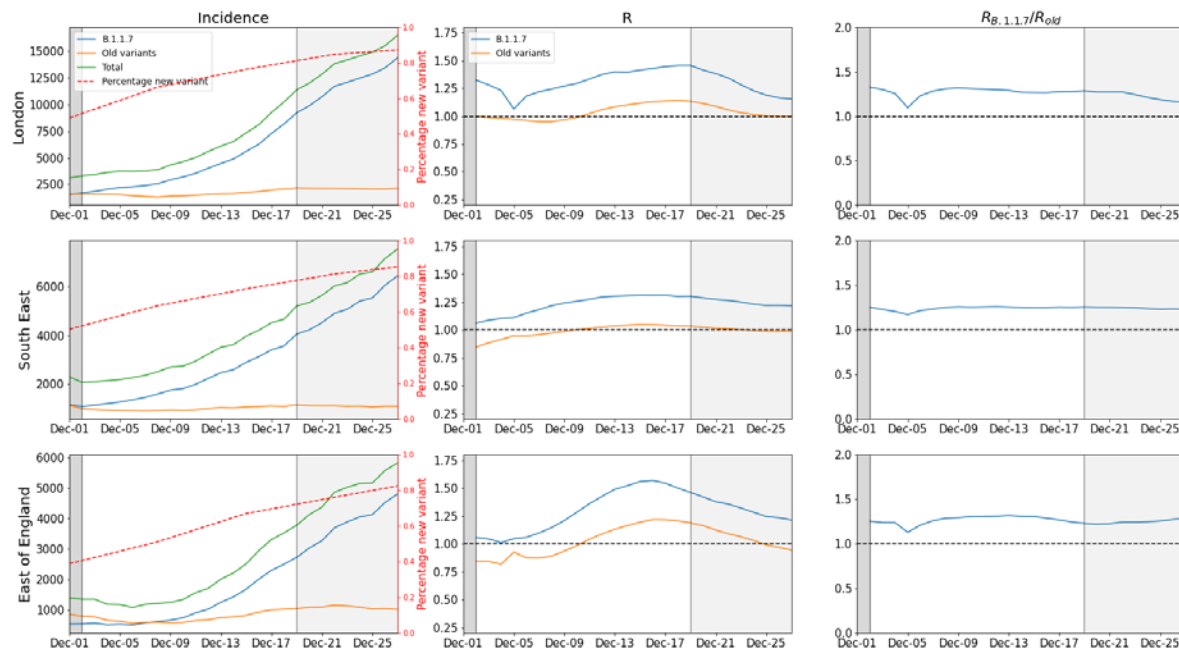


Figure S4. Incidence and $R(t)$ using SGTF data.

Incidence and $R(t)$ for the old and new variants, along with the ratio between these R values, for the three regions in England with the largest proportion of B.1.1.7, using SGTF data. Dark grey regions indicate national lockdowns, light grey shaded the period where London and much of the South East and East of England were placed in Tier 4 restrictions.

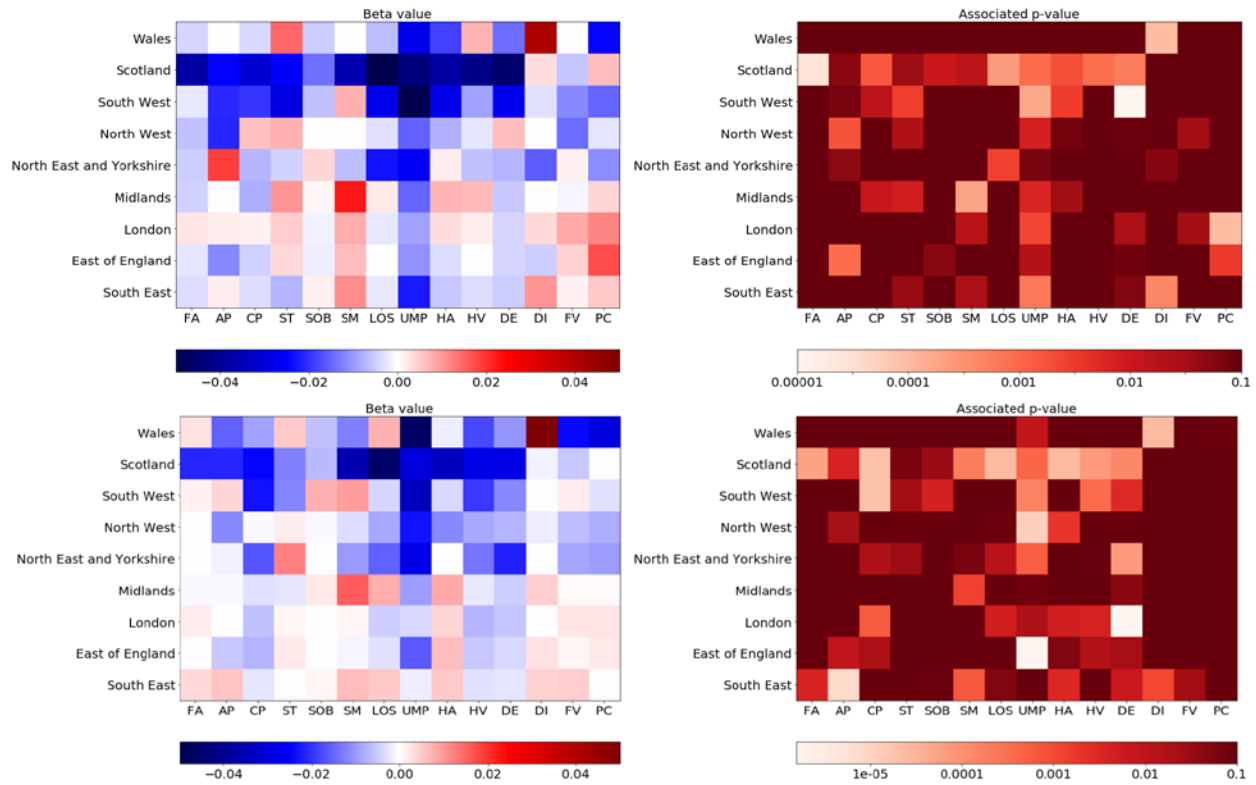


Figure S5. Associations between symptom reports and B.1.1.7.

Colour plot of beta values and associated p-values for each region and symptom when investigating association between symptom report (in a 4 week window around the test) and proportion of variant B.1.1.7. Top row shows results for uncorrected model, and the bottom row shows results for the model corrected for age, sex, temperature and humidity. Note that the p-values are capped at 0.1. Beta-values are presented for an increase of 0.1 in the proportion of variant B.1.1.7.

Key: FA - fatigue, AP - abdominal pain, CP - chest pain, ST - sore throat, SOB - shortness of breath, SM - skipped meals, LOS - loss of smell, UMP - unusual muscle pains, HA - headache, HV - hoarse voice, DE - delirium, DI - diarrhoea, FV - fever, PC - persistent cough

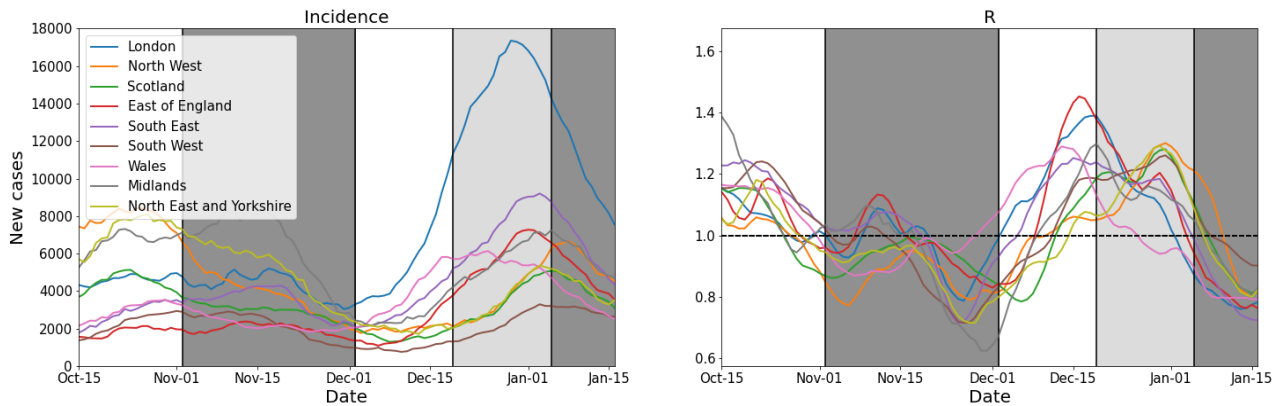


Figure S6. Incidence and $R(t)$ for all regions, extended to 15 January 2021.

Total incidence and $R(t)$ for all regions, extended to capture the third national lockdown beginning 5 January 2021. Dark grey regions indicate national lockdowns, light grey indicate the period where London and much of the South East and East of England were placed in Tier 4 restrictions.

Supplementary Tables

Table S1. Coefficients for association between B.1.1.7 and asymptomatic infection, long duration, hospital reports, number of symptoms.

Beta coefficient of the variant proportion when evaluating association with number of reported symptoms, asymptomatic rate, proportion of hospital report and proportion of individuals with symptom duration ≥ 28 days across the different regions when correcting for age, sex, temperature and humidity. All values are presented for an increase in 0.1 in the proportion of variant B.1.1.7. All results are presented in the form mean [CI]; p-value

	Proportion of fully asymptomatic	Number of symptoms reported over 4 weeks around test	Proportion of hospital reports	Proportion of individuals with symptom duration ≥ 28 days
South East	0.001 [-0.015;0.017] ; 0.901	-0.021 [-0.163;0.121] ; 0.733	-0.002 [-0.011;0.007] ; 0.624	-0.003 [-0.009;0.004] ; 0.37
East of England	0.002 [-0.008;0.012] ; 0.588	-0.012 [-0.153;0.13] ; 0.851	-0.002 [-0.01;0.006] ; 0.52	-0.002 [-0.015;0.01] ; 0.689
London	-0.005 [-0.014;0.005] ; 0.298	0.031 [-0.055;0.116] ; 0.423	-0.002 [-0.007;0.003] ; 0.298	-0.002 [-0.013;0.009] ; 0.682
Midlands	-0.016 [-0.028;-0.004] ; 0.014	0.02 [-0.133;0.173] ; 0.766	-0.002 [-0.007;0.003] ; 0.328	0.002 [-0.01;0.015] ; 0.671
North East and Yorkshire	-0.011 [-0.046;0.023] ; 0.462	-0.086 [-0.444;0.272] ; 0.586	-0.011 [-0.04;0.019] ; 0.426	0.015 [-0.022;0.052] ; 0.349
North West	-0.005 [-0.023;0.013] ; 0.512	-0.053 [-0.218;0.111] ; 0.468	-0.009 [-0.015;-0.004] ; 0.005	0 [-0.031;0.031] ; 0.98
South West	0.015 [-0.011;0.04] ; 0.217	-0.261 [-0.437;-0.085] ; 0.01	-0.001 [-0.02;0.018] ; 0.902	-0.048 [-0.091;-0.004] ; 0.036
Scotland	0.022 [-0.013;0.058] ;	-0.4 [-0.711;-0.088] ; 0.019	-0.018 [-0.037;0.002] ;	-0.012 [-0.027;0.003] ;

	0.177		0.073	0.107
Wales	-0.002 [-0.05;0.047] ; 0.943	-0.041 [-0.683;0.601] ; 0.884	-0.008 [-0.045;0.028] ; 0.602	-0.053 [-0.141;0.035] ; 0.192

Table S2. Regional reinfection rates and correlation between reinfection and B.1.1.7 / total cases.

Regional reinfection rates, and the Spearman correlation between daily reported reinfections and the proportion of B.1.1.7, and between the number of reinfections and new reported cases.

Region	Reinfection rate	Correlation between B.1.1.7 and reinfection	Correlation between new cases and reinfection
South East	1.3%	0.52	0.69
East of England	1.3%	0.56	0.60
London	0.9%	0.38	0.56
Midlands	1.3%	0.32	0.60
North East and Yorkshire	0.6%	-0.07	0.26
North West	0.8%	-0.01	0.34
South West	0.9%	-0.16	0.27
Scotland	0.6%	0.38	-0.13
Wales	1.0%	0.12	0.32

Table S3. Comparison of correlation between reinfection and B.1.1.7 / total cases.

Comparison of regional correlation over time between proportion of B.1.1.7 and number of possible reinfections and between new reported cases and number of possible reinfections. Medians over 100 bootstrapped samples are calculated for each and compared using a Mann-Whitney U test.

Region	Median correlation between B.1.1.7 and reinfection	Median correlation between new cases and reinfection	p-value
South East	0.55	0.69	<0.001
East of England	0.51	0.56	<0.001
London	0.46	0.62	<0.001
Midlands	0.28	0.75	<0.001
North East and Yorkshire	-0.02	0.30	<0.001
North West	0.06	0.43	<0.001
South West	-0.35	0.05	<0.001
Scotland	0.59	-0.15	<0.001
Wales	0.07	0.26	<0.001

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