

Paper for SAGE – case definitions for contact tracing
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Accuracy of symptom clusters in 301 COVID-19 positive adults from first few hundred study vs. 1626 adults reporting acute respiratory infection to Flu Watch Survey (prior to COVID-19).

Upper respiratory – Cough OR Runny nose OR Sneezing OR Fever OR Feverish

Gastrointestinal – Diarrhoea OR Nausea OR Vomiting

General –Loss of Appetite OR Loss of sense of smell

Definition	Sensitivity	Specificity	ROC
Cough OR Fever	91%	19%	0.55
Cough OR Fever OR SOB	93%	13%	0.53
Upper respiratory	95%	3.3%	0.49
Gastrointestinal	47%	77%	0.62
General	68%	60%	0.64
Upper respiratory AND gastrointestinal OR general	76%	53%	0.65
General AND gastrointestinal OR upper respiratory	67%	61%	0.64
Gastrointestinal AND upper respiratory or general	46%	77%	0.62
Any two - upper respiratory, general or gastrointestinal	76%	53%	0.65
Any one - upper respiratory, general or gastrointestinal	97%	2%	0.50
Algorithmic based approaches – ZOE Symptom tracker app			
5 symptom logistic regression score	74%	46%	0.66
Machine learning score with contextual information	74%	64%	0.66

Recommended initial case definition for contact tracing app and NHS 111 algorithm

Upper respiratory (Cough or runny nose or sneezing or fever or feeling feverish) AND Gastrointestinal (Diarrhoea OR Nausea OR Vomiting) OR General (Loss of appetite OR Loss of sense of smell).

Recommended definition	Age < 16	Age 16-44	Age 45-64	Age 65+
Sensitivity	Unknown	75%	77%	74%
Specificity	Unknown	49%	56%	55%

Alternative approaches

Upper respiratory – Cough OR Runny nose OR Sneezing

Gastrointestinal – Diarrhoea OR Nausea OR Vomiting

General –Loss of Appetite OR Loss of sense of smell OR Fever OR Feeling Feverish

Definition	Sensitivity	Specificity	ROC
Cough OR Fever	91%	19%	0.55
Cough OR Fever OR SOB	93%	14%	0.53
Upper respiratory	87%	6.3%	0.47
Gastrointestinal	47%	77%	0.62
General	85%	44%	0.64
Upper respiratory AND gastrointestinal OR general	79%	44%	0.61
General AND gastrointestinal OR upper respiratory	80%	46%	0.63
Gastrointestinal AND upper respiratory or general	46%	77%	0.62
Any two - upper respiratory, general or gastrointestinal	83%	42%	0.63
Any one - upper respiratory, general or gastrointestinal	97%	2%	0.50
Algorithmic based approaches – ZOE Symptom tracker app			
5 symptom logistic regression score	74%	46%	0.66
Machine learning score with contextual information	74%	64%	0.66