Office for National Statistics

Article

# Symptoms consistent with influenza-like illness in those who tested negative for COVID-19 in England: Coronavirus (COVID-19) Infection Survey, UK: 8 March 2023

The percentage of those testing negative for coronavirus (COVID-19) in England reporting symptoms consistent with influenza-like illnesses (ILI) by age group and the characteristics of people reporting ILI.

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# 1 . Main points

Symptoms reported in the Coronavirus (COVID-19) Infection Survey among people who test negative for COVID-19 may provide valuable information about other respiratory infections that are circulating among the population, including influenza. Influenza-like illness (ILI) is a term used to describe a diagnosis of possible influenza or other illness causing a set of common symptoms. This article looks at the percentage reporting symptoms consistent with influenza-like illness by age, and the characteristics associated with reporting these symptoms.

- The percentage of people who tested negative for coronavirus (COVID-19) and reported symptoms consistent with influenza-like illness (ILI) peaked for all ages in December 2022, at 5.6% (95% Confidence Interval: 5.3% to 5.9%), or around 1 in 20 people.
- Since January 2023, the percentage of people who tested negative for COVID-19 and reported symptoms consistent with ILI remained relatively low, with 1.7% (95% Confidence Interval: 1.5% to 1.9%) reporting these symptoms in the latest week (week ending 14 February 2023), or around 1 in 60 people.
- In the week ending 14 February 2023, 1 in 10 people reported a sore throat (10.0%: 95% Confidence Interval: 9.5% to 10.5%); 1 in 5 children aged between two years and school Year 6 reported having a cough (20.3%; 95% Confidence Interval: 17.2% to 23.4%); 1 in 20 children aged between two years and school Year 6 reported a fever (5.4%; 95% Confidence Interval: 3.9% to 6.8%).
- Between 14 December 2022 and 10 January 2023, those more likely to report symptoms consistent with ILI were females when compared with males; people who were disabled or lived in a household with someone who was disabled compared with those who lived in households where no one was disabled; people who had contact with those under 18 years of age from outside their household compared with those who did not.
- Over the same four-week period, people who had a flu vaccination in the 2022 to 2023 season, or in both the 2021 to 2022 and the 2022 to 2023 season, were less likely to report symptoms consistent with ILI than those who had not had a flu vaccination in either season.

# 2 . Overview

Oxford University produce a Weekly analysis of symptoms reported in those testing negative for SARS-CoV-2 by PCR. In partnership with the Office for National Statistics (ONS), they are conducting analyses to find out whether the Coronavirus (COVID-19) Infection Survey could be used to monitor self-reported symptoms consistent with influenza-like illness (ILI) among those who test negative for COVID-19 in England.

Symptoms consistent with ILI were defined following the United States Centers for Disease Control and Prevention (CDC). A fever, sore throat and cough were also considered individually. The CDC defines ILI as a fever (temperature of 100 degrees Fahrenheit or greater), accompanied by a cough or sore throat (or both).

The European Centre for Disease Control (ECDC) has a different definition of ILI and estimates of those testing negative and reporting ILI using this definition are available on our website. As the CDC defines ILI using fewer symptoms, it is likely to show lower levels of ILI than the ECDC definition.

To monitor trends in ILI, this analysis presents age-group-specific daily rates of ILI, (as classified by the CDC), along with daily rates of a fever, sore throat and cough. This is to monitor trends in ILI and examine the differences between age groups during the current flu season.

Additionally, for the first time, we have analysed whether specific characteristics affected the likelihood of reporting symptoms consistent with ILI. Characteristics considered included sex, ethnicity, age, deprivation, household size, region, flu vaccination status, work sector, and other wider factors.

All estimates are unweighted and only data from participants with a confirmed negative polymerase chain reaction (PCR) test for coronavirus (COVID-19) were included for analysis. This was to minimise the influence of COVID-19 illness on reported symptoms. Participants were those living in private households in England, who tested negative for COVID-19 on a PCR test, and self-reported symptoms.

As we cannot exclude the possibility that some participants who have COVID-19 still test negative, there may be a small number of COVID-19 positive cases included in these analyses.

# 3 . Influenza-like illness in those testing negative for COVID-19 by age group

The percentage of people testing negative for coronavirus (COVID-19) in England and who reported symptoms consistent with influenza-like illness (ILI) as classified by the the Centers for Disease Control and Prevention (CDC) definition (a fever and a cough or sore throat), peaked for all ages in December 2022 at 5.6% (95% Confidence Interval: 5.3% to 5.9%) and decreased to 1.4% (95% Confidence Interval: 1.3% to 1.5%) in January 2023. Since January 2023, the percentage of people testing negative for COVID-19 and reporting ILI remained relatively low, with 1.7% (95% Confidence Interval: 1.5% to 1.9%) recently reporting these symptoms (as of 14 February 2023).

As of 14 February 2023, the percentage of those testing negative for COVID-19 reporting ILI was:

- highest for those aged two years to school Year 6 at 3.9% (95% Confidence Interval: 2.6% to 5.1%), around 1 in 26 children
- lowest for those aged 65 years and over at 1.0% (95% Confidence Interval: 0.8% to 1.2%), around 1 in 100 people

### Figure 1: The percentage of participants who tested negative for COVID-19 and reported symptoms consistent with influenza-like illness peaked in December 2022

**The percentage of participants who tested negative for coronavirus (COVID-19) and reported symptoms consistent with influenza-like illness by age group, England, 1 August 2022 to 14 February 2023**

### Notes:

1. Influenza-like illness was defined using the Centers for Disease Control and Prevention (CDC) classification (a fever, and a cough or sore throat).

2. Those estimates with a wider confidence interval have a higher degree of uncertainty.

3. Data are unweighted and present the percentage of the population living in private households in England.

4. All estimates are provisional and subject to revision.

**Download the data**

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## About our estimates

To estimate the trends in symptoms reported by COVID-19 negative participants over time, generalised additive models (GAM) were fitted on data from study participants in England between 1 August 2022 and the most recently available data (week ending 14 February 2023). Models were estimated separately by age group and for the overall population. Reported symptoms refer to symptoms that participants reported they experienced in the past seven days.

The GAMs used a negative-binomial distribution with log link, estimating the association between daily rates and calendar time with thin plate splines (k=50), penalised based on the third derivative. No other explanatory variables than time (measured in the number of days since 1 August 2022) were included in the models.

All estimates contained in this article are therefore unweighted. They present the percentage of the population living in private households in England who tested negative for coronavirus (COVID-19) on a polymerase chain reaction (PCR) test, and self-reported symptoms. As the data are unweighted and the sample for this analysis includes only those who have tested negative for COVID-19 on a swab test, there was no known population of which weighted estimates could be representative.

We describe trends by comparing the predicted prevalence of the most recent data over time. Our age group analysis separates children and young people by school age.

More detailed information on this analysis, carried out by our research partners at the University of Oxford, is available on their website, hosted at the Nuffield Department of Medicine.

# 4 . Sore throat symptoms in those testing negative for COVID-19 by age group

The percentage of people testing negative for coronavirus (COVID-19) in England and who reported a sore throat, peaked for all ages in December 2022 at 17.2% (95% Confidence Interval: 16.7% to 17.6%), or around 1 in 6 people. Since January 2023, the percentage of people testing negative for COVID-19 and reporting a sore throat has remained relatively stable with 10.0% (95% Confidence Interval: 9.5% to 10.5%), or 1 in 10 people, reporting sore throat symptoms on 14 February 2023.

In the most recent week (up to 14 February 2023), the percentage of those testing negative for coronavirus (COVID-19) and reporting a sore throat was highest for children and younger adults:

- approximately 1 in 8 of those aged two years to school Year 6 reported a sore throat (13.3%; 95% Confidence Interval: 10.8% to 15.8%)
- for those in school Year 7 to 11, around 1 in 7 reported a sore throat (13.9%; 95% Confidence Interval: 11.6% to 16.3%)
- around 1 in 7 of those in school Year 12 to aged 34 years reported a sore throat (13.4%; 95% Confidence Interval: 11.8% to 14.9%)

In the same week, those aged 65 years and over were least likely to report a sore throat with around 1 in 16 (6.3%) (95% Confidence Interval: 5.7% to 6.8%) reporting this symptom.

### Figure 2: Around 1 in 10 people who tested negative for COVID-19, reported a sore throat in the most recent week

**The percentage of participants who tested negative for coronavirus (COVID-19) and reported a sore throat by age group, England, 1 August 2022 to 14 February 2023**

### Notes:

1. We describe trends by comparing the predicted prevalence in the most recent data over time.
2. Those estimates with a wider confidence interval have a higher degree of uncertainty.
3. Data are unweighted and present the percentage of the population living in private households in in England.
4. All estimates are provisional and subject to revision.

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## 5 . Fever symptoms in those testing negative for COVID-19 by age group

Of those testing negative for coronavirus (COVID-19) in the week ending 14 February 2023:

- around 1 in 50 reported a fever (2.1%; 95% Confidence Interval: 1.9% to 2.3%)
- the percentage of participants reporting a fever was highest for those aged two years to school Year 6 (5.4%; 95% Confidence Interval: 3.9% to 6.8%) and lowest for those aged 65 years and over (1.2%; 95% Confidence Interval: 1.0% to 1.5%)

### Figure 3: The percentage of participants testing negative for coronavirus (COVID-19) and who reported a fever was highest for those aged 2 years to school Year 6

**The percentage of participants who tested negative for coronavirus (COVID-19) and reported a fever by age group, England, 1 August 2022 to 14 February 2023**

### Notes:

1. Those estimates with a wider confidence interval have a higher degree of uncertainty.
2. Data are unweighted and present the percentage of the population living in private households in in England.
3. All estimates are provisional and subject to revision.

**Download the data**

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# 6 . Cough symptoms in those testing negative for COVID-19 by age group

Of those testing negative for coronavirus (COVID-19) in the week ending 14 February 2023:

- around 15.5% (95% Confidence Interval: 14.9% to 16.1%), reported a cough, equating to approximately 1 in 7 people
- the percentage of participants reporting a cough was highest for those aged two years to school Year 6 (20.3%; 95% Confidence Interval: 17.2% to 23.4%), around 1 in 5 children

### Figure 4: The percentage of participants who tested negative for coronavirus (COVID-19) and reported a cough by age group, England, 1 August 2022 to 14 February 2023

**The percentage who tested negative for coronavirus (COVID-19) and reported a cough by age group, England, 1 August to 14 February 2023**

### Notes:

1. Those estimates with a wider confidence interval have a higher degree of uncertainty.
2. Data are unweighted and present the percentage of the population living in private households in in England.
3. All estimates are provisional and subject to revision.

**Download the data**

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# 7 . Characteristics associated with reporting influenza-like illness

This analysis looks at the characteristics associated with reporting symptoms consistent with influenza-like illness (ILI), as defined by the Centers for Disease Control and Prevention (CDC), in participants who tested negative for COVID-19. Characteristics included demographic, health, work-related and behavioural factors.

Our latest data for the four weeks ending 10 January 2023, showed that of those who tested negative for COVID-19:

- females were more likely to report symptoms consistent with ILI than males
- people who lived in a household with a child were more likely to report symptoms consistent with ILI than those who did not
- people who lived in a household where someone else reported having contact with a care home were more likely to report symptoms consistent with ILI than those living in a household that had no contact
- people who had contact with hospitals were more likely to report symptoms consistent with ILI than those living in a household that had no contact
- people who were disabled, or lived in a household with someone who was disabled, were more likely to report symptoms consistent with ILI than households where no one was disabled
- people who had contact with those under 18 years of age from outside their household were more likely to report symptoms consistent with ILI than those who had no contact
- people who shopped more times outside of the home were more likely to report symptoms consistent with ILI than those who shopped fewer times
- people who vaped were more likely to report symptoms consistent with ILI than those who did not
- people who had a flu vaccination in the 2022 to 2023 season, or in both the 2021 to 2022 and the 2022 to 2023 season, were less likely to report symptoms consistent with ILI than those who had not had a flu vaccination in either season

Additional factors were also associated with reporting symptoms consistent with ILI, these are available in our accompanying data set.

### Figure 5: People who tested negative for COVID-19 and had contact with those under 18 years from outside their household were more likely to report influenza-like illness

**Estimated likelihood of reporting symptoms consistent with influenza-like illness in those who tested negative for COVID-19 by characteristic, England, 14 December 2022 to 10 January 2023**

### Notes:

1. Estimates with a wider confidence interval have a higher degree of uncertainty.
2. An odds ratio indicates the likelihood of an individual reporting influenza-like illness symptoms for a particular characteristic. See the [Glossary] for full definition.
3. The core demographic variables - sex, ethnicity, age, geographical region, urban or rural classification of address, deprivation percentile, household size, and whether the household was multigenerational - are included to adjust for these factors when comparing characteristics.
4. All estimates are provisional and subject to revision.

**Download the data**

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# 8 . Collaboration

The Coronavirus (COVID-19) Infection Survey analysis was produced by the Office for National Statistics (ONS) in collaboration with our research partners at the University of Oxford, the University of Manchester, UK Health Security Agency (UKHSA) and Wellcome Trust. Of particular note are:

- Elisabeth Dietz - University of Oxford, Nuffield Department for Medicine: Research Biostatistician
- Sarah Walker - University of Oxford, Nuffield Department for Medicine: Professor of Medical Statistics and Epidemiology and Study Chief Investigator
- Koen Pouwels - University of Oxford, Health Economics Research Centre, Nuffield Department of Population Health: Senior Researcher in Biostatistics and Health Economics
- Thomas House - University of Manchester, Department of Mathematics: Reader in Mathematical Statistics

# 9 . Glossary

## Influenza-like illness (ILI) definition

The Centers for Disease Control and Prevention (CDC) defines ILI by a fever (temperature of 100 degrees Fahrenheit or greater), accompanied by a cough or sore throat (or both). The European Centre for Disease Control (ECDC) defines ILI by at least one of fever, fatigue, headache or myalgia and at least one of cough, sore throat or shortness of breath.

## Age groups for children and young people

- "Aged two years to school Year 6" includes children in primary school and below.
- "School Year 7 to school Year 11" includes children in secondary school.
- "School Year 12 to those aged 24 years" includes young adults who may be in further or higher education.

Those aged 11 to 12 years and those aged 16 to 17 years have been split between different age categories depending on whether their birthday is before or after 1 September.

### Odds ratio

An odds ratio indicates the likelihood of an individual reporting symptoms consistent with ILI-CDC or ILI-ECDC given a particular characteristic or variable. When a characteristic or variable has an odds ratio of one, this means there is neither an increase nor a decrease in the likelihood of reporting ILI compared with the reference category. An odds ratio greater than one indicates an increased likelihood of reporting ILI compared with the reference category. An odds ratio less than one indicates a decreased likelihood of reporting ILI when compared with the reference category.

### Confidence interval

A confidence interval gives an indication of the degree of uncertainty of an estimate, showing the precision of a sample estimate. The 95% confidence intervals are calculated so that if we repeated the study many times, 95% of the time the true unknown value would lie between the lower and upper confidence limits. A wider interval indicates more uncertainty in the estimate. Overlapping confidence intervals indicate that there may not be a true difference between two estimates. For more information, see our methodology page on statistical uncertainty.

### False-positives and false-negatives

A false-positive result occurs when a test suggests a person has coronavirus (COVID-19) when in fact they do not. By contrast, a false-negative result occurs when a test suggests a person does not have COVID-19 when in fact they do. For more information on false-positives and false-negatives, see Section 9.

## 10 . Data sources and quality

### Remote data collection

The Office for National Statistics' (ONS's) Coronavirus (COVID-19) Infection Survey has moved from collecting data and samples through home visits by a study worker to a more flexible approach for participants. We have introduced an online questionnaire and swab and blood samples are returned through the post (or by courier for some participants). Further information on what these changes mean and how the survey will continue to be valuable can be found in our recent blog post: The COVID-19 Infection Survey is changing.

This release includes data only from 1 August 2022, when data were collected remotely.

### Methodology for characteristics analysis

The methods used for characteristics analysis were adapted from our Analysis of populations in the UK by risk of testing positive for coronavirus (COVID-19) article. The amendments made in this analysis included:

- changing the outcome variable to "reporting symptoms consistent with ILI or not"
- controlling for those reporting flu vaccination in either 2021 to 2022 or 2022 to 2023 vaccination periods, or both, or neither
- not including within the models: previous COVID-19 vaccination; previous COVID-19 infection wave; and use of face coverings at work/school or enclosed spaces

### Inconclusive and failed tests

Our estimates are based on participants with confirmed negative test results for COVID-19. Positive or inconclusive swabs are not included in this analysis. Some swabs are test failures, that also are not included in analysis.

### Uncertainty in our estimates

The estimates presented in this article contain uncertainty. There are many sources of uncertainty, including uncertainty in the test, in the estimates and in the quality of data collected in the questionnaire. Information on the main sources of uncertainty is available in our methodology page on statistical uncertainty.

## 11 . Related links

Coronavirus (COVID-19) Infection Survey, Quality Report: September 2022 Article | Last revised 23 September 2022 This quality report presents information on the Coronavirus (COVID-19) Infection Survey data collection method change from study worker home visit to remote data collection.

Coronavirus (COVID-19) Infection Survey, Quality Report: August 2022
Article | Last revised 18 August 2022
This quality report presents information on the Coronavirus (COVID-19) Infection Survey data collection method change from study worker home visit to remote data collection.

Coronavirus (COVID-19) latest insights
Interactive tool | Updated as and when data become available
The latest data and trends about the coronavirus (COVID-19) pandemic from the Office for National Statistics (ONS) and other official sources.

Deaths registered weekly in England and Wales, provisional
Bulletin | Updated weekly
Provisional counts of the number of deaths registered in England and Wales, including deaths involving COVID-19, by age, sex and region, in the latest weeks for which data are available.

Coronavirus (COVID-19) Infection Survey technical article: Cumulative incidence of the number of people who have tested positive for COVID-19, UK
Technical article | Released 22 April 2022
Analysis of the number of people in the UK who have tested positive for COVID-19 using the Coronavirus (COVID-19) Infection Survey. This survey is being delivered in partnership with University of Oxford, University of Manchester, UK Health Security Agency and Wellcome Trust.

## 12 . Cite this article

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