UK Health Security Agency

COVID-19 public health advice changes: scientific summary

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Background

The provision of free universal symptomatic and asymptomatic testing for the general public ended in England on 1 April 2022.

New guidance for the public was introduced on 1 April, advising people with symptoms of respiratory infections including COVID-19 to try to stay at home and avoid contact with other people if they have a high temperature or do not feel well enough to go to work or carry out normal activities. They are advised to resume normal activities once their temperature is resolved and they feel well enough to do so.

Over the course of the pandemic, a wide range of symptoms have been associated with COVID-19. These symptoms are similar to those seen in other respiratory viral infections, so in the absence of testing it is not possible to distinguish one viral illness from another based on symptoms alone.

This paper briefly summarises evidence that supports the guidance introduced on 1 April 2022.

1. COVID-19 symptoms

In the UK, the most commonly reported symptoms have consistently been cough, fatigue and headache, and the least commonly reported symptoms have consistently been abdominal pain, diarrhoea, and nausea or vomiting (1).

In the REACT study, cough, fever and anosmia have remained the symptoms with highest positive and negative predictive value for COVID-19 (2), although anosmia or ageusia was less prominent in infection with the Omicron variant. Cough and anosmia can persist for several weeks after the infectious period.
Other symptoms, such as sore throat, headache, runny nose and fatigue tend to manifest earlier (3) when individuals are likely to be more infectious, but are also very common in people without COVID-19 and are therefore poorly predictive of infection.

If there are other viruses circulating the predictive value of these symptoms decreases even further.

The symptom profile of COVID-19 has been shown to differ by age. In older patients, COVID-19 may be more likely to present with ‘atypical’ symptoms such as delirium, falls, generalized weakness, malaise, functional decline, and other less specific symptoms.

For most children and young people COVID-19 is a mild or asymptomatic infection and very few children become seriously ill. They generally present with similar symptoms to adults, though there are reports of more frequent presentation of fatigue and headaches (4). Findings from a systematic review by Viner and others (5) showed that that fever and cough were the most common symptoms, occurring in around 40 to 60% of infected children and young people.

The symptom profile for the Omicron variant is similar to that of previous variants. A UKHSA analysis (6) comparing the symptom profile of Delta to Omicron variant showed that fever and cough were slightly more likely to be reported in Omicron compared to Delta infections, whereas loss of smell and taste were less likely to be reported.

There are no specific symptoms that predict a worse outcome of COVID-19 by themselves. Various risk scores have been developed in the last 2 years, however most of these require the addition of one or more laboratory tests. A recent pre-print of a simple clinical risk calculator showed that along with various comorbidities, dyspnoea, high respiratory rate and low (less than 95%) oxygen saturation on air were all associated with a significantly higher risk of hospitalization. The authors have now externally validated this risk score (7).

2. Duration of infectiousness

SARS-CoV-2

Epidemiological and contact tracing studies have shown that the infectiousness period of SARS-CoV-2 ranges from 9 days before symptom onset to 15 days after symptom onset, with most transmission occurring 3 days before symptom onset to 5 days after symptom onset (8). Limited viral RNA data on the Omicron variant show that the viral load peaks at 3 to 6 days post symptom onset, which is slightly shorter than that reported for wild-type lineages (9).

The one human challenge study to date in healthy young volunteers (10) with the original Wuhan virus strain showed that viral load peaked about 5 days post inoculation and viable virus was on average detectable until day 10 after the first positive test.

Positive lateral flow device (LFD) tests have been shown to be associated with high viral load in infectious cases (11). Recent data from the ATTACC study (12) and the human challenge study (10) confirm these findings and have shown a direct correlation between viral growth (as a proxy for infectiousness) and LFD tests in the course of an individual infection. A recent CDC (14) study assessing antigen test positivity in 729 individuals showed that 54% of individuals had a positive result between 5 to 9 days after symptom onset.

Recent real world data (unpublished) from NHS Test and Trace (13) on LFD positivity in individuals testing to reduce their 10-day isolation period show that 70% of individuals report a negative LFD result on both day 5 and 6, although the data are self-reported and there is likely to be reporting bias. There was an age gradient with a higher proportion (over 80%) of individuals aged under 20 reporting negative LFD results on days 5 and 6, compared to less than 60% in individuals aged over 60 years.

Individuals who are infected with SARS-CoV-2 and who are asymptomatic can still transmit virus to others (15). The evidence on whether the proportion of asymptomatic cases is higher in children than in adults remains limited (3,16). While there is evidence that asymptomatic children can transmit the disease (2,15), findings from a systematic review published in March 2022 suggest that asymptomatic cases (adults and children) are less infectious than symptomatic cases (16).

There is some evidence that children may be less infectious than adults (2,17). One rapid review suggested a shorter mean duration of viral RNA shedding in respiratory symptoms in children than adults (8). However, detection of viral RNA does not provide direct evidence of infectiousness. Early studies showed the median duration of fever in children to be 3 days compared to 10 days in adult patients (18), suggestive of a shorter illness in children. These results are also in line with the findings from a cohort study conducted in 258,790 UK school-

aged children that suggested COVID-19 in children tended to be of short duration and low symptom burden (4).

Influenza

Viral excretion data from influenza infected individuals indicate that the infectious period is shorter for influenza than for COVID-19. The mean infectious period has been estimated in the region of 1 day (95% CI 0.5 to 1.7), with 95% of cases infectious for less than 2.9 days (19).

Donnelly and others (20) estimated that only 5% of transmission events took place more than 3 days after the onset of clinical symptoms with the predominant influenza (H1N1) virus in 2009.

The proportion of true asymptomatic influenza infection is difficult to estimate due to varying study methods and populations.
In outbreak investigations (where infections were virologically confirmed) 16% of infections were found to be asymptomatic, whereas in longitudinal studies using serology, the point estimates of asymptomatic infections were estimated at around 65 to 85% (21), although there may be recall biases intrinsic to these studies.

A systematic review (22) assessing the relationship between viral shedding and disease transmission found limited evidence that asymptomatic or pre-symptomatic individuals plays an important role in influenza transmission. This is consistent with findings from Laue and others (23), which show that asymptomatic or pre symptomatic transmission may not be an important factor in influenza epidemics.

3. Conclusion

The similarity between the symptom profile of COVID-19 and other respiratory viral infections means that people presenting with acute respiratory viral symptoms are unable to distinguish one viral illness from another based on symptoms alone.

There is no strong evidence that any specific COVID-19 symptoms are associated with greater infectiousness.

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