

Understanding COVID19 tests and what it means...

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How does the COVID19 test work?

- The COVID19 test uses a technique called **PCR** (Polymerase Chain Reaction)
- It works by testing for viral genetic material called RNA
- The tests use samples taken from the nose and throat
- A positive test means viral genetic material is present, but it will not tell you if the virus is viable (live) or not (dead).
- The test is most accurate when done within 7 days of symptoms starting. A positive test result taken at that time indicates infection.



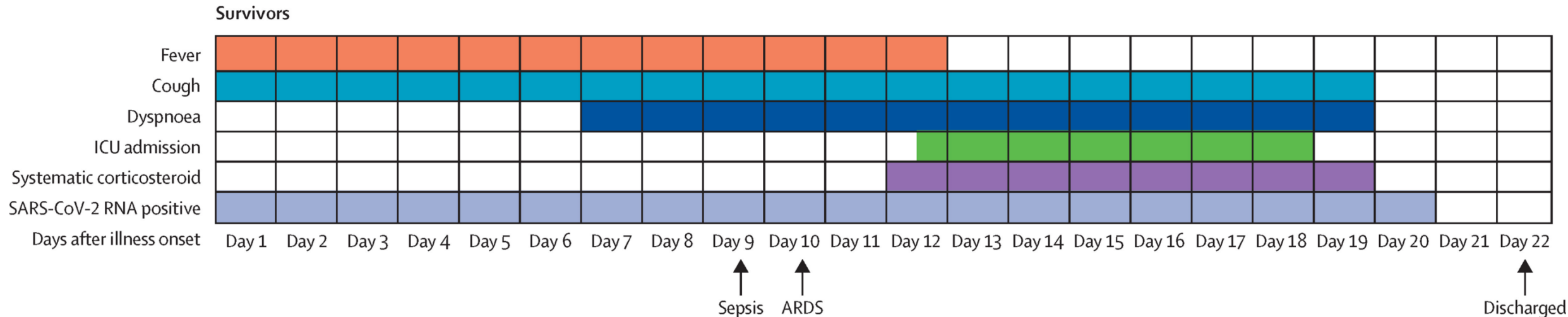
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No test is perfect

- Sometimes we get **false positive** results – i.e. the test is positive but you do not have the infection. This might happen for various reasons such as contamination of the sample.
- Sometimes we get **false negative** results – i.e. the test is negative but you are infected. Again, this might be due to several reasons such as the sample not having been taken correctly.
- So, if you have a negative test but have symptoms you suspect could be COVID19, don't assume you don't have the infection. Get medical advice e.g. NHS111 or GP.

How long do infected persons shed virus?

- Most patients shed virus for 13-24 days
 - Xu et al, Clinical Infectious Diseases, 2020; Zhou et, The Lancet, 2020
- A few cases are known to shed virus for 60 days or more
 - Li et al, American Journal of Tropical Medicine and Hygiene 2020); Liu et al, Journal of infection, 2020
- Detecting viral genetic fragments is of no value. There are patients that keep shedding viral fragments, but are not infectious any more.



How long are patients infectious for?

- Studies suggest infected persons are infectious ~ 2 days before they start having symptoms, and in the first 7-10 days of symptoms.
- Study from Singapore reports that patients are no longer infectious after 11 days.

[https://www.ams.edu.sg/view-pdf.aspx?file=media%5c5556_fi_331.pdf&ofile=Period+of+Infectivity+Position+Statement+\(final\)+23-5-20+\(logos\).pdf](https://www.ams.edu.sg/view-pdf.aspx?file=media%5c5556_fi_331.pdf&ofile=Period+of+Infectivity+Position+Statement+(final)+23-5-20+(logos).pdf)

They also state:

“viral RNA detection by PCR does not equate to infectiousness or viable virus”

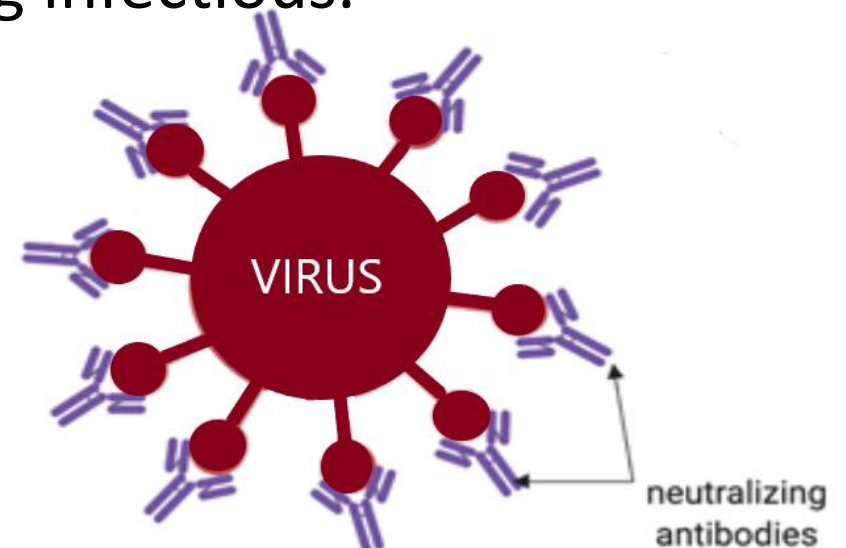
“viable virus was not found after the second week of illness despite the persistence of PCR detection of RNA.”

- So: If a person has no symptoms for at least 2 days and their illness started more than 10 days ago, they are no longer infectious.

Is re-testing required?

No

- Because there is a high chance you will detect viral genetic fragments.
- A positive result only tells you there is still viral genetic fragments being shed. It does not tell you if the person is still infectious.
- Also, in recovering patients, any virus that is shed is covered with neutralizing antibodies which stops them being infectious.



How can we tell if a person is infectious?

- It is not easy to tell if a person is infectious.
- The commonest symptoms are fever and cough, but only 83% have a cough and 67% have a fever! ([Chan et al., 2020](#))
- The proportion of people who have no symptoms varies between
 - 31% to 70.0% ([Japan Ministry of Health, Labor and Welfare, 2020](#), [Dorigatti et al., 2020](#))
- That's why hygiene measures, PPE and physical distancing are very important.
- Have a low threshold to suspect infection.

Antibody tests & Immunity

- There are also now blood tests to see if a person has antibodies to the virus.
- An infected person makes antibodies to the infection which are usually detectable after a few days of infection. (So if you test too early you could get a negative result).
- Similarly, a few months after the infection, the body stops making antibodies against the virus. (So if you test too late you could also get a negative result)
- This test is best for showing **PAST** infection.
- We don't know if you get infected how long the immunity lasts, or how effective it is.
- There are some reports emerging (e.g. from Hong Kong & USA) that people can get re-infected.

What is the risk?

Age	COVID deaths	Population	COVID rate per 100,000	COVID rate as %	COVID rate as 1 in ..
0-4	3	3,515,430	0.1	0%	1 in 1,171,810
5-14	2	7,159,102	0	0%	1 in 3,579,551
15-24	32	6,988,755	0.5	0%	1 in 218,399
25-44	450	15,459,158	2.9	0%	1 in 34,354
45-64	4,359	15,162,118	28.7	0.03%	1 in 3,478
65-74	6,662	5,906,928	112.8	0.11%	1 in 887
75-90	23,679	4,395,359	538.7	0.54%	1 in 186
90+	9,682	528,959	1830.4	1.83%	1 in 55
All	44,869	59,115,809	75.9	0.08%	1 in 1,318



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Observed population fatality rates for deaths registered in England and Wales over the 9-week period 28th March to 29th May. '5-year average' is the average number of deaths from all causes over this period, 2015–2019. 'Covid deaths' have Covid-19 mentioned on the death certificate, the overwhelming majority as a contributory cause of death.

Who is most at risk?

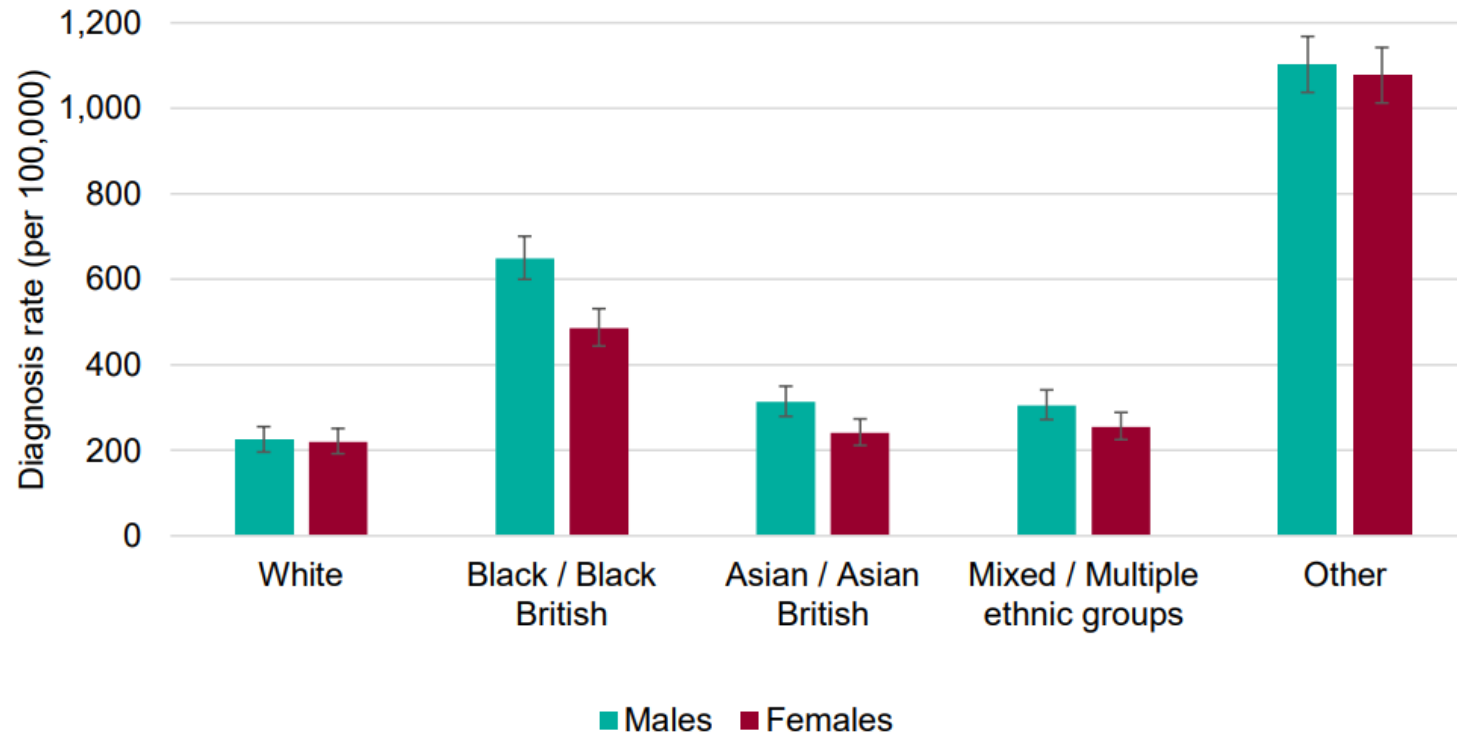


Figure 4.2. Age standardised diagnosis rates by ethnicity and sex, as of 13 May 2020, England. Source: Public Health England Second Generation Surveillance System.

- ***Age***
- ***Gender***
- ***Ethnicity***
- ***Obesity***
- ***Pre-existing health problems***
 - Cancers
 - Immune system problems
 - Breathing problems

Is it aerosol or droplet spread?
And what does it mean for me?



Long COVID

- Most people with COVID recover within 2 weeks or so.
- But, some people may still have lasting effects or have had the symptoms for far longer than expected.
- Issues include breathing difficulties, tiredness, reduced muscle function, impaired ability to do everyday tasks, joint pains, chest pains, and mental health problems such as stress, anxiety, and depression
- Still a lot is not known about this condition.

How to prevent spread

There are no magic bullets, DO IT ALL

FACE, HANDS, SPACE

Avoid CROWDS, CONTACT, CONFINED SPACES

Stay home if you're unwell and get a test



HANDS



FACE



SPACE