

# Minority COVID-19 deaths urgently need to be understood, including potential genetic components

21 May 2020, by Ana Valdes



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The difference in COVID-19 death rates between white people and black, Asian and minority ethnic (BAME) people in the UK is shocking. One [recent report](#) found that, between the beginning of February and the end of April 2020, black people in England were 71% more likely than white people to die from COVID-19. And Asian people were 62% more likely.

This disparity has led to an inquiry by [Public Health England](#) and funding for urgent [academic research](#) into the issue. We expect many factors to be involved, including the disadvantages that BAME people face due to [greater chances of poverty and health issues](#).

But it's important that we examine whether there may also be a genetic component to the problem in order to fully understand what's going on. My colleagues and I are conducting research among frontline healthcare workers to try to see if there are any innate differences in the way different people's immune systems respond to this specific virus, including [genetic differences](#) that may be

associated with ethnicity.

Researchers have identified a greater chance of dying from COVID-19 among BAME people in several countries aside from the UK, including [Norway and the US](#). There are [many social reasons](#) why ethnic minorities may generally be more vulnerable to disease, including a greater chance of malnutrition, more exposure to pollution due to where they live, or greater likelihood of working in less healthy environments.

Inequality and poverty also play a role in the fact that BAME people are [more likely](#) to suffer conditions that we know are linked to a greater chance of dying from COVID-19, such as [diabetes](#) and [heart disease](#).

[Initial data suggests](#) that BAME healthcare workers are more likely to die from COVID-19 than their white colleagues. British Medical Association research has found that BAME doctors are [twice as likely](#) as white doctors to feel pressured into working with inadequate PPE when they are at risk of infection. And they are [twice as likely](#) not to feel confident enough to raise concerns about workplace safety.

However, all these established facts alone don't seem to explain why the risks of COVID-19 vary between different ethnic groups and are lowest among white people. This is particularly the case when we compare it with other forms of [viral pneumonia](#) that do not lead to such a difference.

The study that found BAME people in England were more likely to die from the disease accounted for differences in some underlying health conditions that are strongly linked to social issues, suggesting these [weren't the main factor](#). But the preliminary results from another [study suggest](#) ethnic minorities

aren't more likely to die once other factors linked to deprivation are taken into account.

To clarify this issue, it's important to examine whether there may be some [genetic component](#) that predisposes ethnic minorities to a higher risk to COVID-19, while still recognising the critical role of other factors.

The way people's immune systems work depends on genetic factors, not just environmental and social ones. There are effectively two parts to our immune systems. One is the part that produces antibodies, called the "adaptive immune system." When our body has never seen a virus before, it can take several days for it to produce them, which is why some people get [sick in the first place](#).

We also have an "innate immune system" that acts before our body has had time to make antibodies. This system is strong in children and young people, but not very good [after the age of 65](#). This is likely to be one reason why older people are at higher risk of dying of COVID-19.

When a virus like the [coronavirus](#) SARS-CoV-2 enters a cell, molecules called toll-like receptors, or TLRs, alert the immune system that something potentially harmful is present. Interestingly, many of the body's TLRs that can detect viruses come from genetic instructions found in the [X chromosome](#), for which men have only one copy and women two.

We know that women can have a more [effective innate immune](#) response to other viruses such as HIV than men, and [that oestrogen](#), the female hormone, enhances this type of immune response. We also know that women are [less likely](#) to die from COVID-19 than men.

Just as there are variations in DNA that are responsible for the differences in response of immune cells between the sexes, there can also be variations between people of [different ethnic backgrounds](#). For example, the amount and type of genes that immune cells produce when the TLR-virus pathway is stimulated, are very different between people of African and of European origin.

This is not surprising, because we know that

human populations from different parts of the planet have had to adapt to different types of infections. Ethnic differences in the risk to [other respiratory viral diseases](#) have been linked to genetic variation, and these variants are different in [BAME groups](#) and [white people](#) in [these same pathways](#). However, the role of ethnicity in genetic susceptibility to viral diseases is still controversial.

### **New study**

We want to see if it could be a factor in the higher rate of BAME deaths from COVID-19. To do this, we are [taking blood](#) from frontline healthcare workers of a variety of ethnic backgrounds, assessing DNA differences and measuring the various substances the samples contain. The results could indicate if differences in the innate immune systems of BAME groups result in higher risk of developing severe COVID-19.

If there is some genetic element to the different death rates from COVID-19 between ethnic groups, it's important that we understand it to give us the best chance of fighting the disease. For example, if we do find that the way the innate [immune system](#) works plays a role, we can advise people on ways to improve that system, such as through [what we eat](#).

But that won't change the fact that the generally worse health among BAME groups in western societies is strongly linked to [socioeconomic factors](#) that are known to play a very significant role in this pandemic.

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