What is the ‘R’ number and why is it important?

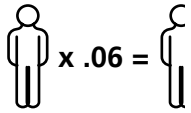
Reproduction number (or R) is one of the most important numbers of the coronavirus pandemic. So what is it? And how is it estimated?

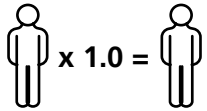
West Yorkshire and Harrogate Health and Care Partnership

The ‘R’ number is a number that says how many people each person who has a disease will infect. The ‘R’ number can change, depending on how many contacts people have, such as during an epidemic lockdown. The number is always an average. It is the rate of new people infected when it is passed on.

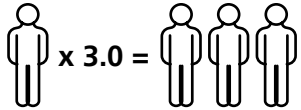
Why is the ‘R’ number important?

Put simply, as long as the ‘R’ number is less than 1, every person with COVID-19 will infect less than one person so the outbreak will decrease in size until it ends. However, if the ‘R’ was to go back above 1, the number of cases could increase, potentially leading to a further outbreak.





One problem in measuring the infections in this way is that it only gives a view of the past.



What do we think the ‘R’ number is?

Latest estimates of the ‘R’ number suggest that in the North East and Yorkshire it is currently 0.8, the highest in the country. This is high compared to London where it is thought to be 0.4.

Studying newly emerged and rapidly growing infectious disease outbreak, such as COVID-19, is important but challenging because of the limited amount of information available.

Herd immunity and the ‘R’ number

Herd immunity, or community immunity, is when a large part of the population is immune to a specific disease. If enough people are resistant to the cause of a disease, such as a virus or bacteria, it has nowhere to go. While not every single person may be immune, the group as a whole has protection. This is because there are fewer high-risk people overall. The infection rates drop and the disease peters out.

Why is it higher in North East and Yorkshire?

A coronavirus ‘north-south divide’ has emerged across England, according to information Public Health England (Telegraph, 14 May 2020). The figures show that the death rate is far higher for older people than was previously thought.

Can you measure the ‘R’ number locally?

Where you live and the spread of the virus locally can also impact on the ‘R’ rate. The publication of regional ‘R’ values highlights the need for us to understand the patterns of disease locally so we can adapt our approaches and advice.

Health inequalities

As we move into the next phase of this pandemic across West Yorkshire and Harrogate, it is becoming clear that the inequality gradient is at risk of getting steeper and starker.

We know that in the impact of COVID-19 is felt the greatest in our most deprived communities, and growing evidence supports this.

Early research from The Intensive Care National Audit and Research Centre found from the first people critically ill with COVID-19 in UK hospitals that 35% of almost 2,000 of people were non-white, nearly triple the 13% proportion in the UK population as a whole. The study is thought to be the first analysis of its kind anywhere in the world looking at the ethnic breakdown of cases of the virus.

What does this mean?

The publication of regional ‘R’ values highlights the need for us to understand the patterns of disease locally so we can adapt our approaches and advice.

These might include the numbers of people requesting tests, the number of people accessing health and care services for COVID-19, Google analytics and measures of social distancing.

You can calculate an ‘R’ for a region or local area but you need the intelligence and data to make this robust and we don’t have this yet.

Other useful information: MRC Biostatistics Unit, University of Cambridge: Nowcasting and Forecasting of COVID-19.

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