# The story of the R number
# How an obscure epidemiological figure took over our lives

## Part 4: The politics of R

Throughout the inquiry, this Committee has struggled to establish who the Government sees as accountable for the data underpinning decisions on Covid 19. Clear accountability for decision making is absolutely integral to our democracy.

**House of Commons Public Administration and Constitutional Affairs Committee, March 2021** – tinyurl.com/msvcujjy

To what degree, and for how long, did R influence government policy in the UK?

The disease reached Parliament in mid-March 2020, a junior health minister being one of the first cases. The concept of R followed in late April and early May. There had been an earlier, isolated outbreak of R on 3 February, when Lord Patel said that R0, "an index or measure of human-to-human transfer", was believed to be around 1 or 2. It was mentioned in the House of Lords on 21 April, when Health Minister Lord Bethell noted the importance of tracking and tracing Covid cases in keeping R0 (he presumably meant $R_t$) down; in the Scottish Parliament on 23 April, when Deputy First Minister John Swinney said the "key test" for reopening schools would be "the reproduction number of the coronavirus [being] as close to zero as possible" (earlier that day, First Minister Nicola Sturgeon said keeping R – "the key factor" – below 1 was key to its approach); in the House of Commons on 4 May, when Angus MacNeill MP noted his area's low R rate; in the Northern Ireland Assembly on 12 May, when Deputy First Minister Michelle O'Neill said that restrictions would not be eased until R came down further; and in the Welsh Senedd on 13 May, when First Minister Mark Drakeford said that R was "underpinning" decisions around restrictions (though Delyth Jewell MS had tabled a question 9 days earlier, asking if the policy was to keep R0 – she also presumably meant $R_t$ – below 1).

R was prominent by 15 May, when the Government Office of Science (GO-Science) published the R number for the first time.

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### Timeline: When did UK parliament start talking about "R"?

- *3 February 2020* R mentioned in Parliament for the first time, by Lord Patel, in a House of Lords discussion about "the Wuhan coronavirus" tinyurl.com/3jrtvhrd
- *21 April 2020* Again in the House of Lords, Health Minister Lord Bethell refers to the importance of keeping the R number down tinyurl.com/yhh5y5x9
- *23 April 2020* In the Scottish Parliament, R mentioned by both Deputy First Minister John Swinney and First Minister Nicola Sturgeon tinyurl.com/3a6fryb5
- *4 May 2020* R referred to in House of Commons by Angus MacNeill MP tinyurl.com/uh6k87zj
- *4 May 2020* In the Welsh Senedd, Delyth Jewell MS tables a question about policy around R tinyurl.com/3e82f2bm
- *12 May 2020* First mention of R in the Northern Ireland Assembly, by Deputy First Minister Michelle O'Neill tinyurl.com/43w7c266
- *13 May 2020* R alluded to by Welsh First Minister Mark Drakeford in the Welsh Senedd tinyurl.com/56ujnfmc
- *15 May 2020* R number published for first time, establishing it firmly in the political lexicon tinyurl.com/yxrxw4ad

There were previously published estimates (as part of SPI-M-O consensus statements and twice-weekly by the Medical Research Council Biostatistics Unit at Cambridge (tinyurl.com/mwtktjpn)); it would also appear on Public Health England's coronavirus dashboard; and publication would evolve, with regional R values appearing in June (tinyurl.com/2bdv4dnt), the UK number being retired in April 2021 (tinyurl.com/mwfhxvzb – regional estimates were more "robust and useful" than a UK-wide figure, given the likely variation between different parts of the country – for more detail on this see Part 1 in the March 2024 issue of *Significance*), and responsibility for producing and publishing R migrating from SPI-M and GO-Science to the UKHSA in July 2021 (tinyurl.com/3zwsw9tp). But this marked a commitment to weekly publication and a permanent public online home, and started to provide further details about where the number came from. (The final publication came on 23 December 2022.)

Parsing politicians' public statements implies R was at the heart of government decision-making on lockdown measures. On top of April's "five tests" (tinyurl.com/yuf378vh) that had to be met before restrictions were eased came evidence from Michael Gove, then Minister for the Cabinet Office, telling the PACAC on 29 April that the "so-called R number" will be "a critical determinant" in easing restrictions. The Prime Minister's avalanche of alpine metaphors the following day – "we've been going through

some huge Alpine tunnel […] it is vital that we do not now lose control and run slap into a second and even bigger mountain" – had emphasised that "nothing" should raise R back above 1. The Scottish Secretary, Alister Jack, told the Scottish Affairs Committee on 5 May that "if the R number stays below 1 and continues to fall, we are going to start to open up the economy".

### Spring and summer

On Sunday 10 May, the Prime Minister announced a new Covid alert system and the creation of the Joint Biosecurity Centre (JBC) to manage it. He reminded viewers of the five tests, but emphasised that the alert level would "be determined primarily by R and the number of coronavirus cases". His slides focused almost exclusively on R, with a fake equation ("Covid alert level = $R$ + number of infections") and some poorly presented charts tightly tying the easing of restrictions to R falling below 1 (tinyurl.com/mpk5ynd5). On top of the five tests came five Covid alert levels – from 1 (Covid-19 no longer present in the UK) to 5 (material risk of overwhelming the NHS) – swiftly parodied on social media for its similarity to the heat scale of sauces at peri-peri chicken chain, Nando's.

Ministerial press conferences continued to raise the lowering of R. Transport Secretary Grant Shapps praised "the whole country" for reducing the rate – "millions of households across the UK have changed their behaviour for the greater good". Matt Hancock, then Health Secretary, reminded everyone of "the

five levels of threat – based on the R value and the number of new cases. The alert level in turn guides the social distancing rules." On 28 May, the Prime Minister was able to tell the nation that the five tests were being met, though these had subtly changed: R was now one of the "other methods of measuring infections" rather than the primary measure, apparently replaced by the number of cases. Easing lockdown was "carefully designed" to keep R below 1 and "we will see how these new changes are working, and look at the R value and the number of new infections before taking any further steps". (Patrick Vallance, alongside him, noted that R remained close – very close, in some areas – to 1.)

Unsurprisingly, the Office for Statistics Regulation thought "Decision-makers across the UK have made it clear that decisions about how we come out of lockdown and whether or not any restrictions need to be re-introduced in future are informed by the value of R." But how? The paperwork establishing the JBC suggests the four chief medical officers of the UK would decide the Covid alert level "under conditions of analytical independence. There is no role for Ministers of any administration in the determination of the UK Covid-19 Alert Level" (tinyurl.com/kdj7tcuh). The UK government website gov.uk was more ambiguous: the JBC is to provide advice to the UK chief medical officers … who in turn advise ministers on the UK coronavirus (COVID-19) alert level" (tinyurl.com/mrayp6kx; tinyurl.com/3h9a4mf9). R is listed as one of several triggers for escalating (and de-escalating) between different levels. (There is no page telling us what the UK's Covid alert level is, although it moved from level 4 to level 3 in May 2021 (tinyurl.com/ybvwd4a5).) It became clear over the summer that R was definitely being used for something: helping to set the threshold for when the NHS contact tracing app should tell ("ping") someone in close contact with a positive Covid case whether they should self-isolate or not (tinyurl.com/4fsrapxa).

### Autumn and winter

Autumn brought renewed political interest in R – and further ambiguity in how it was being used. On 16 September, Science & Technology Select Committee chair Greg Clark asked the Prime Minister whether he would "look

## Glossary

- **GO-Science** – Government Office of Science, a UK government advisory body
- **JBC** – Joint Biosecurity Centre, created to manage the Covid Alert System
- **NHS** – National Health Service, the UK's publicly funded health-care system
- **PACAC** – UK House of Commons Public Administration and Constitutional Affairs Committee
- **PHE** – Public Health England, executive government agency created in April 2013 to protect and improve the nation's health
- **UKHSA** – UK Health Security Agency, which replaced PHE in April 2021
- **SAGE** – Scientific Advisory Group for Emergencies, convened whenever the UK Cabinet needs help handling national emergencies
- **SPI-M** – Scientific Pandemic Influenza Group on Modelling, a subgroup of SAGE
- **SPI-M-O** – Scientific Pandemic Influenza Group on Modelling, Operational, a subgroup of SPI-M

again at what should trigger a change in the rules", given remarks from Vallance that R "was the right thing to measure early on in the epidemic, but it is not the right thing to be using now". The Prime Minister replied that "we look at lots of ways in which the R expresses itself, and that is entirely right. But the rate of reproduction of the disease is still very important." New restrictions later that month – including asking people to work from home and hospitality venues to close at 10 p.m. – were "carefully judged to achieve the maximum reduction in the R number with the minimum damage to lives and livelihoods" (tinyurl.com/447fsjur).

October added three tiers for different local restrictions to the five national alert levels (and hotchpotch pronouncements from ministers as to whether Scotch eggs were a meal "substantial" enough to let pubs stay open). On 21 October, the Labour leader, Sir Keir Starmer, and the Prime Minister clashed in Parliament over the role of R in shedding tier restrictions. Starmer challenged Johnson on comments from Chris Whitty, that even the highest tier (tier 3) would not be enough to bring R below 1, meaning no viable exit from tier 3. He called for a "time-limited circuit break" lockdown instead of the Prime Minister's "prolonged agony", but Johnson

– also switching between R being the main determinant, and merely one measure – refused.

Ten days later, in a surprise Saturday prime ministerial statement sandwiched between the Six Nations rugby and *Strictly Come Dancing*, Johnson reversed course: he announced a time-limited circuit break lockdown. He still thought the tiered approach the right one: "the R has been kept lower than it would otherwise have been, and there are signs that your work has been paying off". R apparently continued to drive government policy – the government's late November "COVID-19 Winter Plan" had 'Bring R below 1 and keep it there on a sustained basis' as one of its three objectives (alongside finding more effective ways to manage the virus and enable life to return to close to normal, and minimising damage to the economy and society), and strengthened the tiers since the previous ones "were not quite enough to reduce [R] below 1" (tinyurl.com/yzkrz3jk). R continued to drive combat in the House of Commons, Starmer arguing a return to tiers with R still above 1 would be "madness" (tinyurl.com/yc5f46mu) and that even the tougher tiers from 2 December would not "hold the rate of infection" (tinyurl.com/54jujzrb). He accused the Prime Minister of reassuring his party "instead of levelling with the British public", and told the Conservative benches "let us just see where we are in two weeks". Within three weeks, a new tier 4 returned London and large parts of the South East to an effective lockdown; another national lockdown followed a few weeks later.

## Into 2021

R was conspicuous by its apparent absence from the government's February 2021 Coronavirus roadmap for lifting lockdown measures (tinyurl.com/bdh7as8r). It appears only in the "additional data annex"; the new "four tests" were instead about vaccine deployment, a reduction in hospitalisations and deaths for those vaccinated, no risk of a surge in hospitalisations, and the assessment of risk not being "fundamentally changed" by new variants of the virus. Sky News noted that "This single metric which was central to Mr Johnson's approach at the start of the pandemic … is no longer a key driver of when to change tack and lift



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lockdown." R could rise above 1 and easing would continue. When asked what R rate a tier 3 area would need to reach (and for how long) to be lowered to tier 2, Lord Bethell replied that "decisions on tier allocation did not focus specifically on the 'R' rate" – the "five key indicators" were instead case detection rates, case detection in the over 60s, the rate at which cases were rising or falling, the positivity rate (positive tests as a percentage of all tests), and pressures on the NHS (tinyurl.com/32wsskrb). In reality, R was still very much present as a key input to the roadmap's models and measures – but it was no longer *the* key input, or public output.

## The use of R in decision-making

"The lockdown decisions are essentially political, but they must be informed by data," the National Statistician told the PACAC. But an inquiry by the Committee concluded it was "not possible to judge" whether key decisions, like the first lockdown, were data-informed (tinyurl.com/msvcujjy). It could, though, judge that decisions were not transparent and ministers were falling short of "a basic expectation" that they "should be able to justify key decisions through explaining the various data considered". Elsewhere, there was scepticism about whether – for all its political ubiquity – R was being used at all. *Nature* magazine criticised the government's "worryingly myopic" fascination with it but was "not clear how much *R* is actually driving UK policy". The epidemiologist Mark Woolhouse told the Select Committee on Science and Technology that while "the focus on a single R … has been a distraction … I do not think that it is being used a single measure to drive policy, but the impression is out there that this is a particularly critical number", even though it had a "loose and imprecise connection" with the original policy goals of saving lives and reducing the burden on the NHS (tinyurl.com/mrxayzn6).

The scientists modelling R were not sure how central it was to decisions either. Cambridge's Paul Birrell was unsure if R was being used to "justify policies, or being used as back up scientific information that policies being implemented anyway were the right idea, or if people were over-interpreting the numbers"; "we do love our policy-based evidence making, even though people have been trying for years to change it," says Fliss Bennee, co-chair of the Welsh government's Technical Advisory Cell and Technical Advisory Group. Rob Challen, a member of the University of Exeter modelling team, notes how "difficult" it could be to "put models out when the answers might not be the answers everyone wants to hear" (the public wanting to get on with their lives, as much as politicians). Imperial's Samir Bhatt says that in general there was "not much sense" of how the politicians used the data they received, but that's how it should be: the scientists present to SPI-M, "we've done our jobs at that point … it's policy-makers' jobs to make decisions. They can't pass the buck to scientists. Though it doesn't sound like they took much advice". ∎

**Next issue**
In part five, we assess the rise and fall of R and lessons learned. Thanks to Understanding Patient Data (understandingpatientdata.org.uk) who first commissioned this text.

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