"Five days of stringent measures" explainer – 27 November 2020

What is prevalence?

Prevalence is the number of people who have SARS-CoV-2 (the virus that causes COVID-19) at any given time. It is not the same as incidence, which is the number of people <u>newly</u> infected on a given day. It is also different to R, which measures the average number of people that an infected person passes the virus on to. If R is greater than 1, it means the epidemic is growing. If it is lower than 1, it means the epidemic is shrinking.

What does it mean to say that "for each day that measures are relaxed, five days of stringent measures are required?"

We know that the virus thrives on close contact between people. If people mix more over the festive period, particularly indoors, then there will be increased transmission. If R increases above 1 then incidence and prevalence will grow. In order to reduce prevalence back to its pre-festive period levels, we would need R to be below 1.

The five day figure quoted refers to one preliminary estimate of the number of days at which R would need to be below 1 for every day that it is above 1, in order to reduce prevalence back to its previous level. It is based on one plausible estimate of the increase in transmission that could happen over Christmas and one plausible estimate of how rapidly stricter measures could result in it dropping again. It is not a precise prediction: the precise length of time would depend on both how rapidly the virus spread over Christmas and how effectively any additional measures slow it again.

If prevalence rose and then fell back to the same level, the number of hospital admissions and deaths would be higher than had it stayed constant for the same period.

How are you sure it is 5 days?

The figure of 5 days was one plausible figure and is not a precise prediction. The exact ratio would depend on how rapidly the virus spreads over Christmas (the quicker this spread, the longer the

recovery time needed) and how effective any additional restrictions are at curtailing growth (the more effective they are, the shorter the length of time they would need to be in place).

The value of 5 days comes from preliminary work from a simple model of disease spread, and refers to the number of days at R = 0.8 that would be needed for every day at R = 2. We cannot precisely predict the expected value of R over Christmas. It could be higher or lower than 2. This will depend on how closely people mix over that period and how effective the test and trace system functions at that time.

For comparison, 2.5 days at R = 0.8 would be needed to reduce prevalence by the same amount as the increase from 1 day at R = 1.5. 6 days at R = 0.7 would be needed to reduce prevalence by the same amount as the increase arising from 1 day at R = 2.8.

These are only simple approximations to what we would expect to happen. Reality would be more complex.

Does "stringent measures" mean "lockdown"?

No. We know that this virus spreads so rapidly that any measures to keep R below 1 need to be stringent. We cannot yet fully evaluate the level of R that has been achieved from the measures put in place in England on 5th November, but as an example of a period in which R was approximately 0.8 (as per the preliminary work referenced in this explainer): SAGE estimated that R was between 0.7 and 0.9 in England on 28th May. It is possible that alternative measures could be introduced that help to keep R below 1.

Why does it take longer to go down than go up?"

Even with the stringent lockdown measures that were in place in Spring, we saw that the epidemic took longer to shrink than it took to grow. If Christmas led to rapid growth in the epidemic, we would see the same pattern again.