SPI-M-O: Consensus Statement on COVID-19

Date: 14th October 2020

FINAL

Summary

1. SPI-M-O's best estimate for **R in the UK is between 1.3 and 1.5.** SPI-M-O's national and regional estimates suggest **R is almost certainly above 1 in England**, **Scotland, Wales, Northern Ireland, and all regions of England.** There is substantial variation in epidemiology within the UK estimate and R is an average rather than a description of the epidemic state in every location.

2. **In England, we are breaching the number of infections and hospital admissions in the Reasonable Worst Case planning scenario that is based on COVID-S's winter planning strategy. The number of daily deaths is now in line with the levels in the Reasonable Worst Case and is almost certain to exceed this within the next two weeks.** Were the number of new infections to fall in the very near future, this exceedance of the reasonable worst case scenario might only continue for three to four weeks, but if R remains above 1 then the epidemic will further diverge from the planning scenario.

3. There is no clear evidence that the epidemic's trajectory has changed in the past month. SPI-M-O's modelled consensus is a **doubling time in the UK for new infections of between 10 and 15 days.** There is significant heterogeneity across geographies and the potential for faster doubling times in certain areas.

4. The delay between initial infection, developing symptoms, the need for hospital care and death means these estimates **cannot fully reflect recent changes in transmission which might have occurred over the two to three weeks, including any impact from recently announced measures**.

5. There is complete consensus in SPI-M-O that the current outlook for the epidemic's trajectory is concerning, if there are no widespread decisive interventions or behavioural changes in the near term.

Reproduction number

6. The reproduction number is the average number of secondary infections produced by a single infected individual. R is an average value over time, geographies, and communities. Therefore, these estimates should be used as a guide to the general trend rather than a description of the epidemic state in all places.

7. **SPI-M-O's best estimate is that R is between 1.3 and 1.5 in the UK**. SPI-M-O's agreed national and regional estimates are summarised in **Table 1** and **Figures 1, 2, and 4**. These suggest R is almost certainly above 1 in England, Scotland, Wales, Northern Ireland, and all regions in England.

8. SPI-M-O's consensus R and growth rate estimates are based on a range of models that use a variety of data sources including deaths, hospital admissions, and number of individuals testing positive. The delay between initial infection, developing symptoms and the need for hospital care, means that, **such estimates cannot yet fully reflect the most recent changes in transmission from the past two to three weeks**, including any impact from the measures recently announced.

9. **There is consensus that it is almost certain the epidemic continues to grow across the country.** SPI-M-O's R and growth rate estimates for the UK and England are in line with previous weeks – any differences are explained by reporting delays, rounding and the inclusion of different models in the statistical combination for estimates.

Growth rates and doubling times

10. For small daily changes, the growth rate is approximately the proportion by which the number of infections increases or decreases per day, i.e. the rate at which an epidemic is growing or shrinking[1].

11. SPI-M-O's consensus estimate is that **growth rate in the UK is between +4% to +7% per day**. SPI-M-O's national and regional estimates are summarised in **Table 1** and **Figure 3.** This growth rate suggests **the number of new daily infections was doubling in the recent past every 10 to 15 days in the UK**. As above, these estimates cannot fully reflect any changes in transmission which might have occurred over the past two to three weeks. As with R, there is uncertainty in estimates of growth rate and doubling time.

Reliability

12. As the number of infections is increasing across the UK, SPI-M-O's view is that there is less variability in the R and growth rate estimates compared to those made two to three months ago. There may still be high degrees of variability in, for example, a localised outbreak, however, **SPI-M-O considers all this week's estimates to be reliable.**

[1] Further technical information on the growth rate can be found in Plus magazine.

13. Care should still be taken when interpreting R and growth rate estimates for the UK, due to their inherently lagged nature and the fact these figures mask variation in the number of infections and how transmission is changing in some parts of the country.

Incidence

14. Combined estimates from six SPI-M-O models suggest there are between **43,000 and 74,000 new infections per day in England**. This is significantly above the profile of the reasonable worst-case scenario, where the number of daily infections in England remained between 12,000 – 13,000 throughout October.

15. Modelling from the ONS swabbing survey for the most recent week of the study (2nd to 8th October) estimates that an average of **336,500 people had COVID-19** in the community in England (credible interval 312,200 to 362,000) – this is a significant increase on their previous estimate. In Wales, ONS estimate that an average of **7,900 people had COVID-19** during this period (credible interval 2,400 to 18,200). The study also estimates that, during the same week, there were **27,900 new infections per day in England** (credible interval of 22,700 to 38,200).

16. As the ONS survey estimates are based on survey results collected one to two weeks ago and given the current state, it is **highly likely that the epidemic has continued to grow since** and, therefore, the number of new infections each day is likely to be higher than estimated by the swabbing survey.

Medium-term projections

17. **The number of infections and hospital admissions are breaching those in the Reasonable Worst Case planning scenario** that is based on COVID-S's winter planning strategy. The number of daily deaths is now in line with the levels in the Reasonable Worst Case and is almost certain to exceed this within the next two weeks.

18. Beyond two weeks, the projections in the accompanying document become more uncertain and there is greater variability between models. This reflects the large differences that can result from distinct data streams, and the influence of small deviations in estimated growth rates and current incidence. Projections in the nearer term, however, are more certain; for example, those who are projected to die from COVID-19 in two weeks' time are likely to already be infected.

19. **These projections should not be interpreted as forecasts or predictions of what will happen but are intended to project potential outcomes based on current trends**. They do not include the impact of recent measures that have not yet been detected in

observed data, including any national and local interventions introduced in the last one to two weeks. The current pattern is assumed to continue unaltered for six weeks and without any impact of seasonality in transmission patterns.

20. Measuring population immunity in the most affected communities needs urgent investigation. SPI-M-O would like to see serology focused on higher risk areas to collect data on how sero-positivity in different demographic groups is changing over time and at different spatial scales.

Optimal use of testing

21. Testing can be used in conjunction with contact tracing to control transmission outbreaks and also acts a surveillance data stream to estimate the prevalence of the virus. There is some evidence that the volume of testing has varied considerably by region over time.

22. Very high numbers of tests per day would need to be conducted to confidently detect changes in transmission in low prevalence areas. Fewer tests would be needed to act as a surveillance tool in areas of high prevalence. Focusing tests on high prevalence areas reduces surveillance effectiveness of testing.

23. The control function of testing is dependent on the proportion of positive cases who seek a test, and the delay between test and result, as well as other aspects that are not affected by testing availability.

24. There is some indication that the distribution of delays has changed markedly with increasing demand. Delays beyond 24 hours result in greatly reduced contact tracing effectiveness. Increasing the supply of tests will potentially reduce the effectiveness of contact tracing if this results in more delays, particularly the proportion returned within 24 hours. Negative test results are also potentially important for reducing the harms associated with self-isolation.

25. The relationship between prevalence and testing supply on the effectiveness of controlling transmission is confounded by the distribution of delays and requires more work to understand.

Annex: PHIA framework of language for discussing probabilities

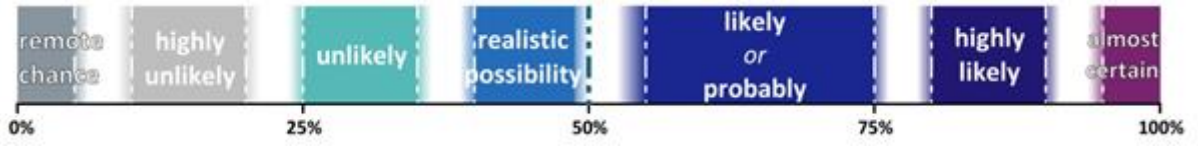

Table 1: Combined estimate of R and the growth rate in the UK, four nations and English NHS regions (90% confidence interval)

Nation	R	Growth rate per day
England	1.2 – 1.4	+4% to +7%
Scotland	1.3 – 1.6	+6% to +9%
Wales	1.1 – 1.4	+2% to +6%
Northern Ireland	1.4 – 1.6	+6% to +10%
UK	**1.3 – 1.5**	**+4% to +7%**

NHS England region	R	Growth rate per day
East of England	1.3 – 1.5	+4% to +8%
London	1.1 – 1.4	+2% to +5%
Midlands	1.2 – 1.5	+4% to +7%
North East and Yorkshire	1.3 – 1.4	+4% to +7%
North West	1.3 – 1.5	+5% to +7%
South East	1.3 – 1.5	+5% to +8%
South West	1.3 – 1.6	+6% to +10%

Figure 1: SPI-M-O groups' estimates of median R in the UK, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded area represents the combined numerical range and the black bar is the combined range after rounding to 1 decimal place.

The UK estimate of R is the average over very different epidemiological situations and should be regarded as a guide to the general trend rather than a description of the epidemic state.

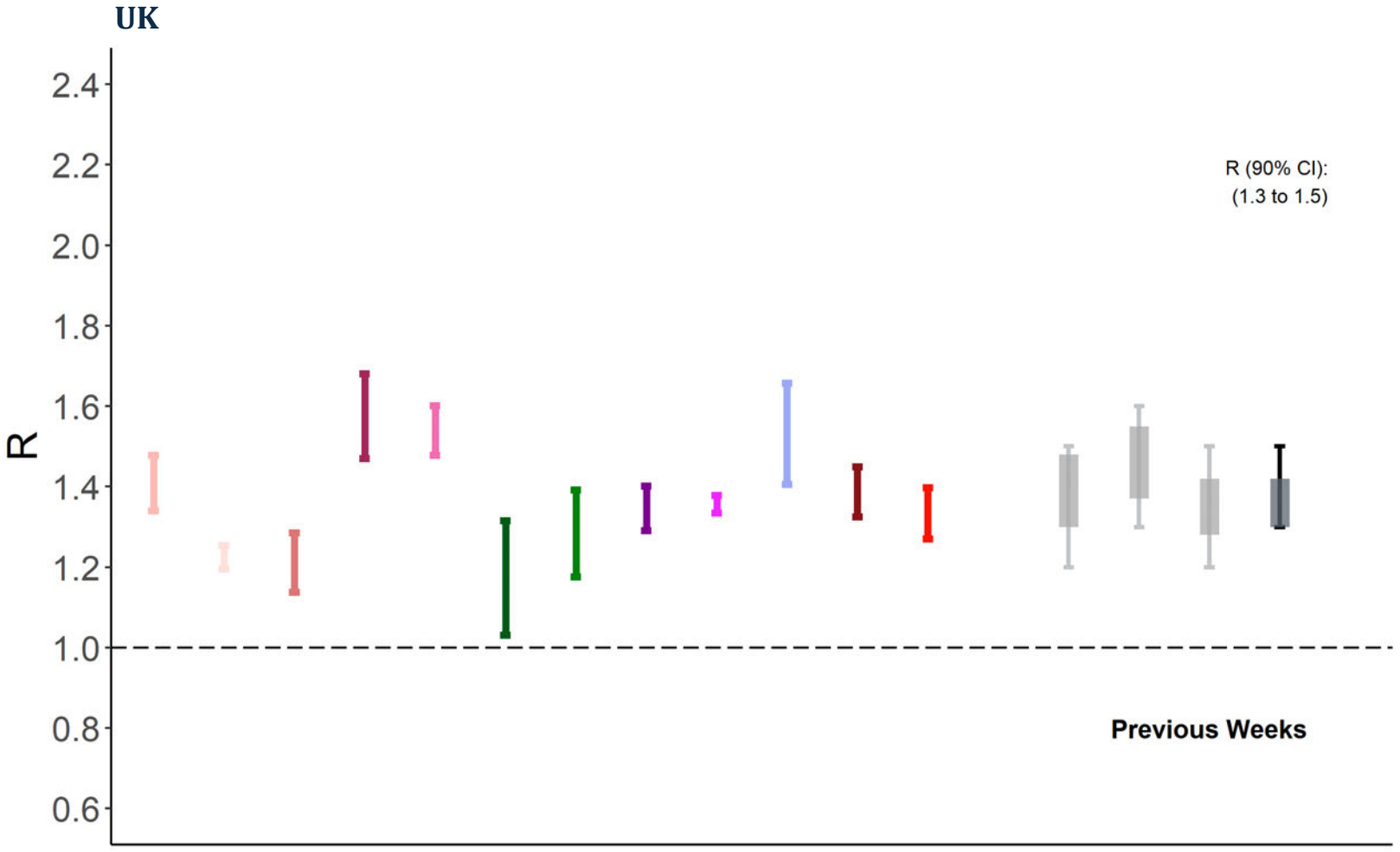

Figure 2: SPI-M-O groups estimates of median R in the four nations of the UK, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.

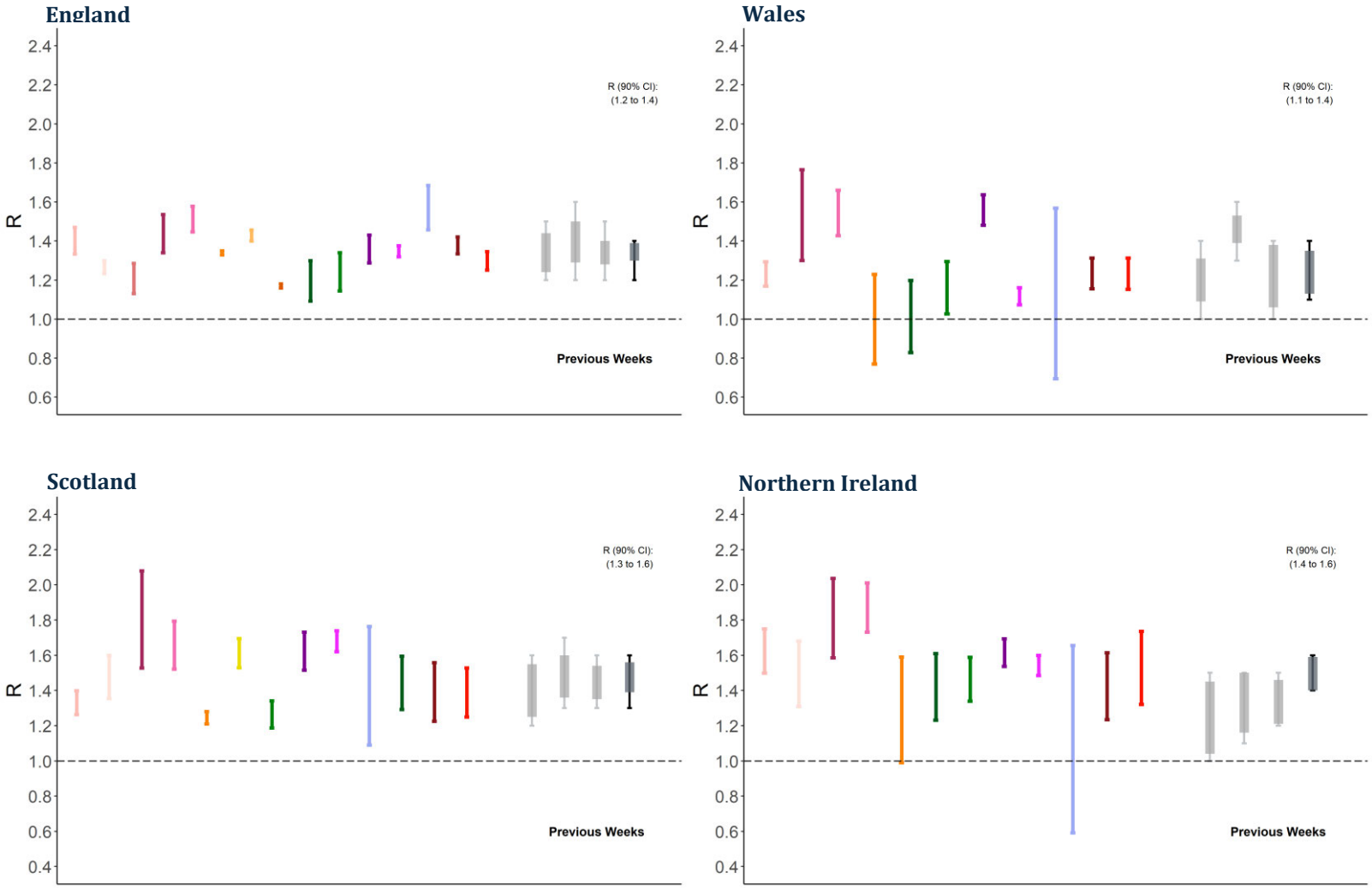

Figure 3: SPI-M-O groups estimates of the growth rate in NHS England regions, including 90% confidence intervals. Bars represent different modelling groups. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 2 decimal places.

Figure 4: SPI-M-O groups estimates of median R in the NHS England regions, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.