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

Date: 23rd September 2020

FINAL. SIGNED OFF BY CO-CHAIRS ON BEHALF OF SPI-M-O

Summary

1. SPI-M-O's best estimate for **R in the UK is between 1.2 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.**

2. **The epidemic is close to breaching the agreed Reasonable Worst Case Scenario on which NHS, DHSC and HMG contingency plans are based.** As outlined by COVID-S, planning has followed a strategy under which action is taken in mid-September to halt epidemic growth. Unless the measures announced on 22nd September reduce R back below 1, it is likely that infection incidence and hospital admissions will exceed the planning levels.

3. The epidemic is evolving rapidly, and events may outpace SPI-M-O's current assessment quite quickly. There are significant uncertainties that make precise estimation difficult, but there is complete consensus that the epidemic is growing and evolving rapidly.

4. Difficulties in interpreting testing data at present mean that estimates of doubling times are uncertain. SPI-M-O's modelled consensus is a **doubling time in the UK for new infections of between 9 and 14 days. Estimates based on hospital admissions suggest a shorter doubling time that could be as fast as 7 days.** There is significant heterogeneity across geographies and the potential for even faster doubling times in certain areas.

5. These estimates **do not fully reflect recent changes in transmission which might have occurred over the past two to three weeks**. They are based on data gathered from before the Government's announcements on 22nd September 2020.

6. A two-week "circuit break" (or precautionary brake) would be most effective when growth of the epidemic beforehand is relatively low (R at or below 1.2) and additional measures during the break are sufficiently effective to push R well below 1. A single circuit breaker is not a long-term solution, but has the potential to keep prevalence much lower than had there been continued exponential growth instead. Long-term control of the virus would require repeated circuit breaks, or for one to be followed by a longer-term period with measures in place to keep R at or below 1.

Reproduction number

7. 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.

8. **SPI-M-O's best estimate is that R is between 1.2 and 1.5 in the UK**. SPI-M-O's agreed national and regional estimates are summarised in **Table 1** and suggest R is almost certainly above 1 in England, Scotland, Wales, Northern Ireland and all regions in England.

9. 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 the impact of measures announced on 22nd September.

10. **Recent operational issues with NHS Test and Trace have exacerbated the level of uncertainty in SPI-M-O's estimates**. Demand for symptomatic testing is not being met and testing delays have changed over recent weeks, making it difficult to interpret trends in the data and adding further uncertainty to the modelling.

11. All testing systems have a finite capacity, and it is important that when if capacity is exceeded that the system continues to perform well on the tests that can be done. SPI-M-O notes that the median delay from sample to test result has increased significantly, which significantly reduces the value of the tests done. Recording the reason for testing will ensure that biases in tests completed/rejected can be accounted for. Focussing testing on areas of known high prevalence reduces the control in areas of low prevalence.

Growth rates and doubling times

12. 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].

13. SPI-M-O's consensus estimate is that **growth rate in the UK is between +4% to +8% per day**. SPI-M-O's national and regional estimates are summarised in **Table 1.** This

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

growth rate suggests **the number of new daily infections was doubling in the recent past every 9 to 14 days in the UK**. As mentioned above, these estimates cannot fully reflect any changes in transmission which might have occurred over past two to three weeks.

14. SPI-M-O is concerned that the true doubling time could be much quicker than this, with estimates produced using hospital admissions suggesting **it could be as fast as 7 days in the UK**. There is the potential for even faster doubling times in certain areas.

Reliability

15. 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 than previously. While numbers of deaths remain low, there is a consensus in SPI-M-O that these do not reflect the changes in transmission being observed in other data sources. 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.**

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

Incidence

17. Combined estimates from two SPI-M-O models suggest there are **11,000 to 20,000 new infections per day in England**. The change in the top end of SPI-M-O's incidence estimate since last week is due to a change in methodology, rather than because a drop n incidence has been detected.

18. During transition periods, when epidemic behaviour shifts and data streams diverge due to unavoidable lags, model-based estimates of the current situation become more uncertain. Consequently, SPI-M-O recommend that more weight be given to surveillance streams that have been set up for this purpose (ONS swabbing study and REACT study).

19. Modelling from the ONS swabbing survey for the most recent week of the study (13th to 19th September) estimates that an average of **103,600 people had COVID-19** in the community in England (credible interval 85,600 to 123,400), a marked increase compared to the previous week. In Wales, ONS estimate that an average of **10,800 people had COVID-19** during this period (credible interval 4,400 to 20,200). The study also estimates that, during the same week, there were **9,600 new infections per day in England** (credible interval of 7,100 to 12,600).

20. The number of daily infections in England seen in the reasonable worst-case scenario from mid-September to early November is around 12,000-13,000.

Circuit breakers and strategies

21. SPI-M-O have further considered the impact a two-week "circuit break" could have on the number of cases, hospitalisations and deaths over the winter period.

22. A more in-depth piece of modelling (see accompanying paper tabled at SAGE) supports previous findings. Introducing strong social-distancing measures for two weeks has the potential to reduce infection prevalence. It could result in prevalence taking several weeks to reach the level seen at the start of the circuit break period.

23. A circuit break would be most effective when growth of the epidemic beforehand is relatively low (R at or below 1.2), and measures are sufficiently stringent and well adhered to that they lower R significantly below 1. If R is only reduced slightly below 1 then a circuit break will generate little time additional to the two-week period of the intervention itself.

24. A shorter break of a week or less is likely to be far less effective, with there being less time to reduce the number of infections and reset the growth of the epidemic. Due to the delay between infection, developing symptoms and the need for hospital care, the impact of the break on hospitalisations and deaths will not be apparent until it is over.

25. A circuit breaker is not a long-term solution, but has the potential to keep prevalence much lower than had there been continued exponential growth instead. Long-term control of the virus would require repeated circuit breaks, or for one to be followed by a longer-term period with measures in place to keep R at or below 1. However, the lower prevalence would reduce incidence reducing pressure on testing and tracing and reduce the risk of having to apply emergency measures.

26. Long-term management of the epidemic will be a balancing act between direct and indirect effects on health caused by COVID-19 and the economic and health disbenefits caused by intervention measures. There is great potential to use of data and modelling to inform the choice of policy measures that would meet the Government's long-term strategic objectives. Such calculations would be complicated by uncertainty around if or when a highly effective vaccine or treatment will become available, but those difficulties are not insurmountable. SPI-M-O welcomes the clarity brought by stating the top strategic objectives are to protect the NHS and keep schools open. Further detail on specific objectives would allow advice to be issued on how policy objectives could be expected to achieve them.

Annex: PHIA framework of language for discussing probabilities

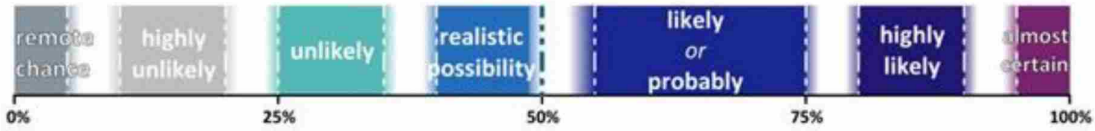

Table 1: Combined estimate of R and the growth rate in the UK, four nations and English NHS regions (90% confidence interval)

Nation	R	Growth rate per day
England	1.2 – 1.5	+4% to +8%
Scotland	1.2 – 1.6	+4% to +9%
Wales	1.0 – 1.4	+1% to +5%
Northern Ireland	1.0 – 1.5	0% to +7%
UK	**1.2 – 1.5**	**+4% to +8%**

NHS England region	R	Growth rate per day
East of England	1.1 – 1.3	+1% to +4%
London	1.2 – 1.5	+4% to +9%
Midlands	1.2 – 1.5	+3% to +7%
North East and Yorkshire	1.2 – 1.5	+4% to +8%
North West	1.2 – 1.5	+3% to +9%
South East	1.0 – 1.3	+1% to +5%
South West	1.1 – 1.4	+1% to +6%

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.

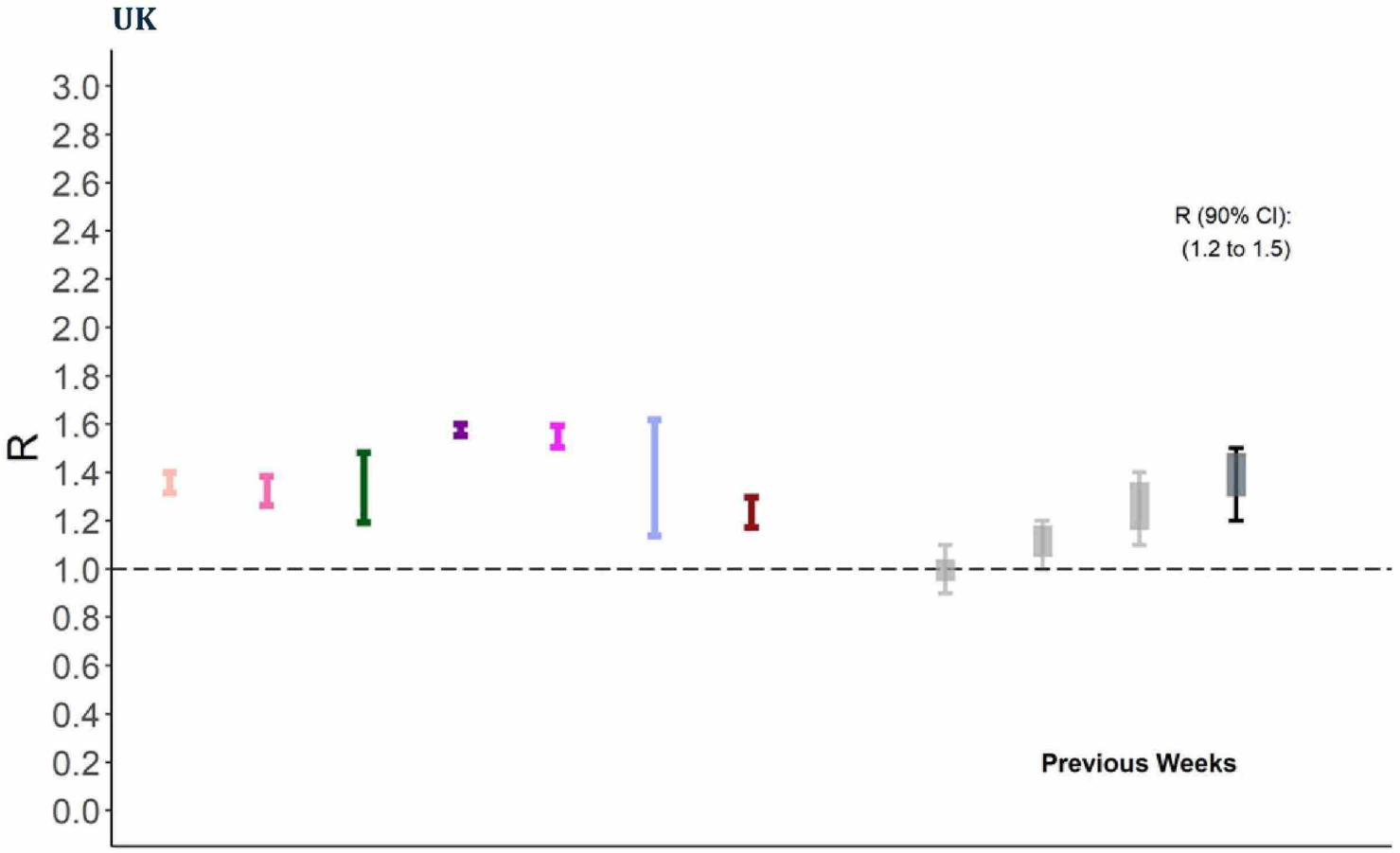

Figure 2: SPI-M-O groups estimates of median R in the four nations of the UK, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.

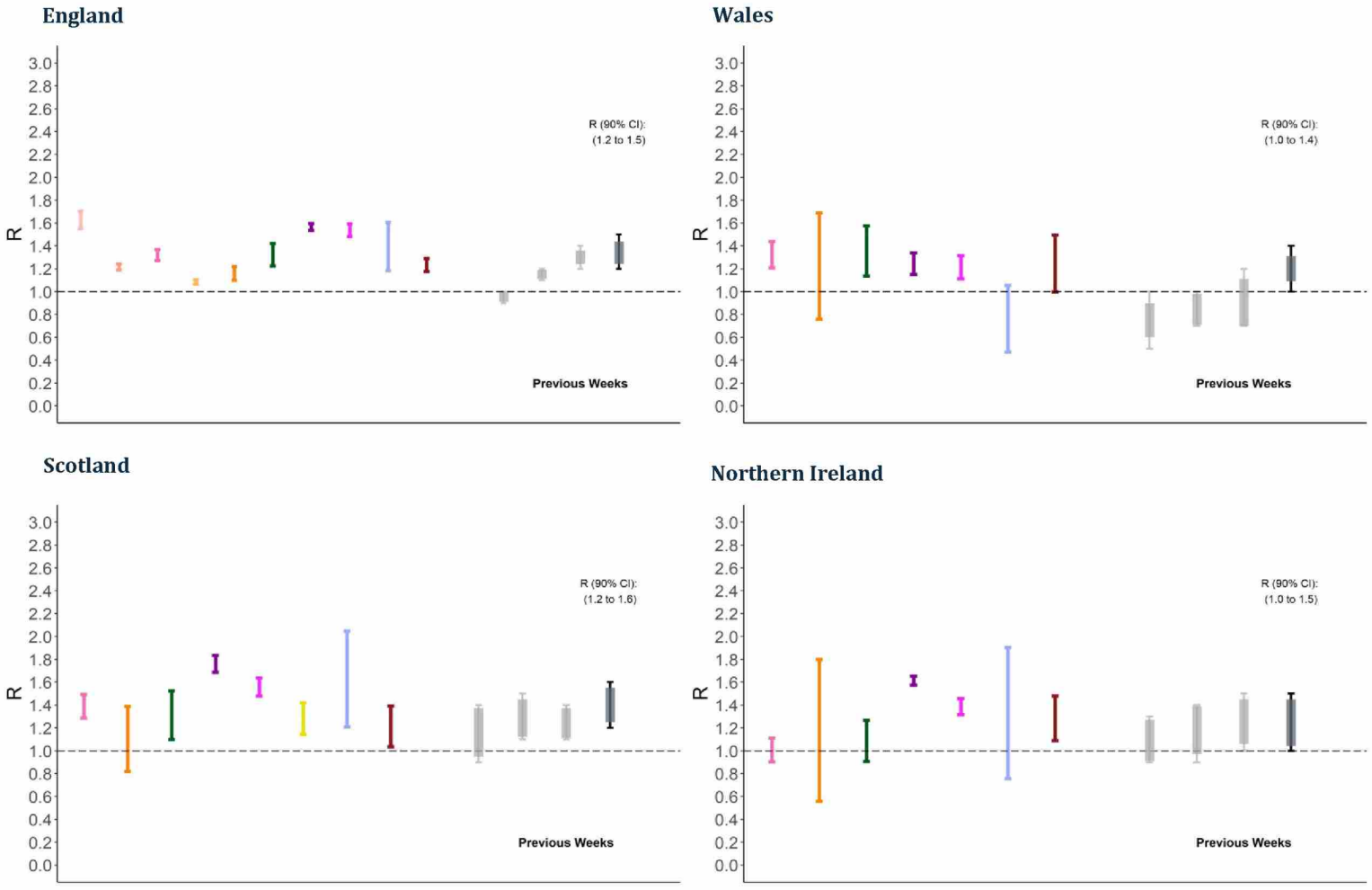

Figure 3: SPI-M-O groups estimates of the growth rate in NHS England regions, including 90% confidence intervals. Bars represent different modelling groups. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 2 decimal places.

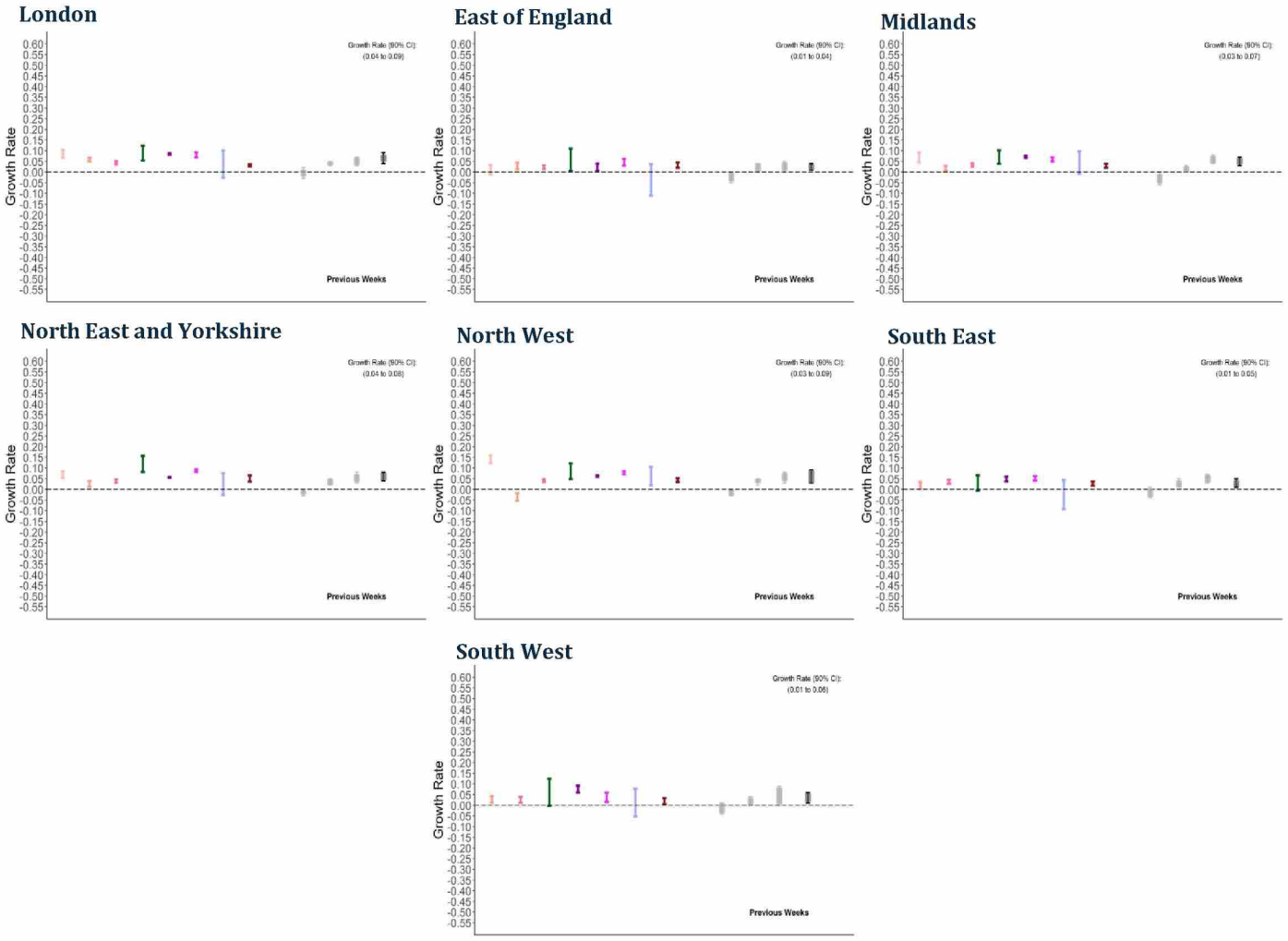

Figure 4: SPI-M-O groups estimates of median R in the NHS England regions, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.