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

Date: 16th September 2020; Updated 18th September 2020

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

Summary

1. The epidemic is evolving rapidly, and SPI-M-O's current assessment might become out of date quickly. There are significant data uncertainties that make precise estimation impossible, but there is complete consensus that the epidemic situation is very serious.

2. SPI-M-O's best estimate for **R in the UK is between 1.1 and 1.4.**

3. SPI-M-O's best estimate for **R in England is between 1.2 and 1.4. R is almost certain to be higher than 1 in Scotland, Northern Ireland, and all but one region of England.** The estimates of R for the South West spans 1. The estimate for Wales spans 1, but is likely artificially low for data reasons.

4. SPI-M-O's consensus estimate is that **the number of infections in the UK is growing by between +2% and +7% per day**, while the estimate for the growth rate in **England is between +3% and +7% per day**; this equates to a **doubling time** for new infections of between around 10 to 20 days in the recent past. SPI-M-O's consensus view is that the current doubling time **could be as fast as 7 days nationally**, with significant heterogeneity across geographies, with the potential for even faster doubling times in certain areas.

5. These estimates continue to **not fully reflect any recent changes in transmission** from the past two to three weeks as a result of, for example, the reopening of schools in England or the introduction of the "rule of six" and other changes. The estimates of R average over very different epidemiological situations and are a guide to the general trend rather than a description of the epidemic state in all places.

6. It is **almost certain that an increase in infections will lead to increases in hospitalisations and deaths**, and there are indications of hospital admissions increasing. Medium term projections are of a **rapid increase in hospital admissions** in the coming weeks.

7. The latest reasonable worst-case scenario (RWCS) assumed incidence doubled once in August and once again in the first two weeks of September, before re-imposed measures halt this growth. The RWCS agreed with ministers assumed that policy interventions would be made in mid-September to halt the rise in infections. **Current incidence estimates from ONS's COVID-19 infection study align with those estimated by the current**

RWCS for this point in the scenario. SPI-M-O's estimated incidence range for England at present is *up to* 38,000 new infections per day. As behaviour shifts and data streams diverge due to unavoidable lags, model-based estimates of the current situation become more uncertain, and this is exacerbated by changes in data streams

8. A planned "circuit breaker" period, where strict non pharmaceutical interventions are reintroduced for two weeks around the October half term, have the potential to reduce prevalence and prevent hospitalisations and deaths reaching high levels, whilst balancing non-COVID harms.
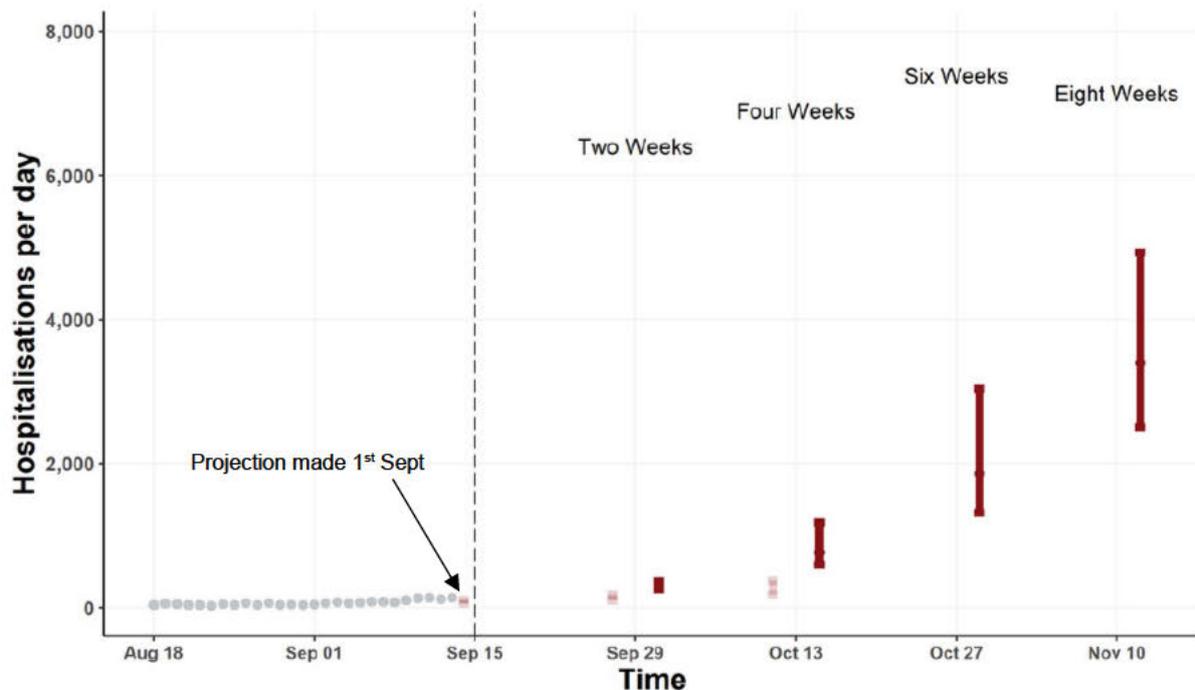
Reproduction number

9. 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.

10. **SPI-M-O's best estimate for the UK is that R is between 1.1 and 1.4**, and SPI-M-O's best estimate for **R in England is between 1.2 and 1.4**. SPI-M-O's agreed national estimates of R are summarised in **Table 1** and **Figures 3 and 4** and the previous three consensus estimates of R are included to show the trend.

11. SPI-M-O's consensus estimates for R and growth rates are based on a range of models that use a variety of data sources including deaths, hospital admissions, and infections detected through testing. As a result, **these estimates cannot yet reflect the most recent changes in transmission from the past two to three weeks** that may be a result of, for example, reopening of schools in England. Further upcoming likely changes in transmission also concern SPI-M-O, such as the return of university students. It is highly likely that, unless the causes of this increase in transmission are curtailed, incidence will grow exponentially, and hospitalisations and deaths will follow the same pattern.

12. **Recent operational issues with NHS Test and Trace have exacerbated SPI-M-O's uncertainty in their estimates of R, growth rates, doubling time and incidence**. The service currently appears to be at capacity, which is resulting in two important complications. The demand for symptomatic testing is not being met, so pillar 2 cases are subject to a time-dependent constraint and observed trends are not a simple reflection of the level of positive cases. Just as important for interpretation, delays in testing have changed and those changes in delays may be different for positive and negative results.

Medium term projections

13. SPI-M-O have been developing medium term projections looking ahead to the next six to eight weeks. Projections from one group are given below. They show the range of hospital

admissions per day in England that could be expected, based on current trends assuming no further policy or behavioural changes are made. **Such a high level of hospital admissions has the potential to overwhelm the NHS.**

Figure 1: Medium term projections from one SPI-M-O modelling group for daily new hospital admissions in England. Red lines give credible intervals at each time point – faded red lines are from the projection two weeks ago. Grey dots give past data points.

Growth rates and doubling times

14. 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].

15. SPI-M-O's consensus estimate is that **growth rate per day in the UK is between +2% to +7% per day**. SPI-M-O's national estimates of growth rates are summarised in **Table 1**.

16. SPI-M-O best estimate of the **doubling time of new infections is around 10 to 20 days**. As for estimates of R and growth rate, this reflects transmission as of two to three weeks ago. SPI-M-O's consensus view, however, is that **the *current* doubling time could be as fast as 7 days nationally**, with significant heterogeneity across geographies and the potential for even faster doubling times in certain areas.

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

17. The proportion of pillar 2 tests returning a positive result has the potential to provide an earlier indicator of observed changes in community transmission. Trends in these data, however, are difficult to interpret due to changes in testing behaviour, operational performance and strategies, particularly in areas of local intervention where testing volumes have increased. Observation of the proportion of people testing positive in pillar 2 data suggests that the epidemic has been rapidly increasing between 25th August and 7th September, growing at around **+6% per day over the past 2 weeks in England (95% confidence interval +5% to +8%)**.

Regional variation and reliability

18. Consensus estimates for the regional growth rates per day in England are also given in **Table 1** and **Figure 5**. Consensus regional estimates of R for England are given in **Table 1** and **Figure 6**.

19. All regions of England, with the exception of the South West, now have R ranges completely above 1.0 and all have positive growth rates. This is also the case for Scotland and Northern Ireland. The estimates of R for Wales and the South West span 1. The estimates for Wales are particularly uncertain due to differences in the data.

20. As detected infections are increasing across the UK, SPI-M-O's view is that there is less variability in estimates than previously seen. While numbers of deaths have fallen to and remain at low levels, there is a consensus in SPI-M-O that these do not reflect the changes in transmission being observed elsewhere through, for example, infection data. 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.**

21. Care should still be taken when interpreting R and growth rate estimates for the UK as a whole, as these figures mask wide variation in the number of infections and patterns of how transmission is changing in some parts of the country and between the different nations of the UK (see **Table 1**).

Incidence

22. Combined estimates from four SPI-M-O models suggest there are *up to* **38,000 new infections per day in England**. This is in line with the recent reported increases in infections found through testing data and this aligns with estimated numbers of daily infections seen in the reasonable worst-case scenario for mid-November.

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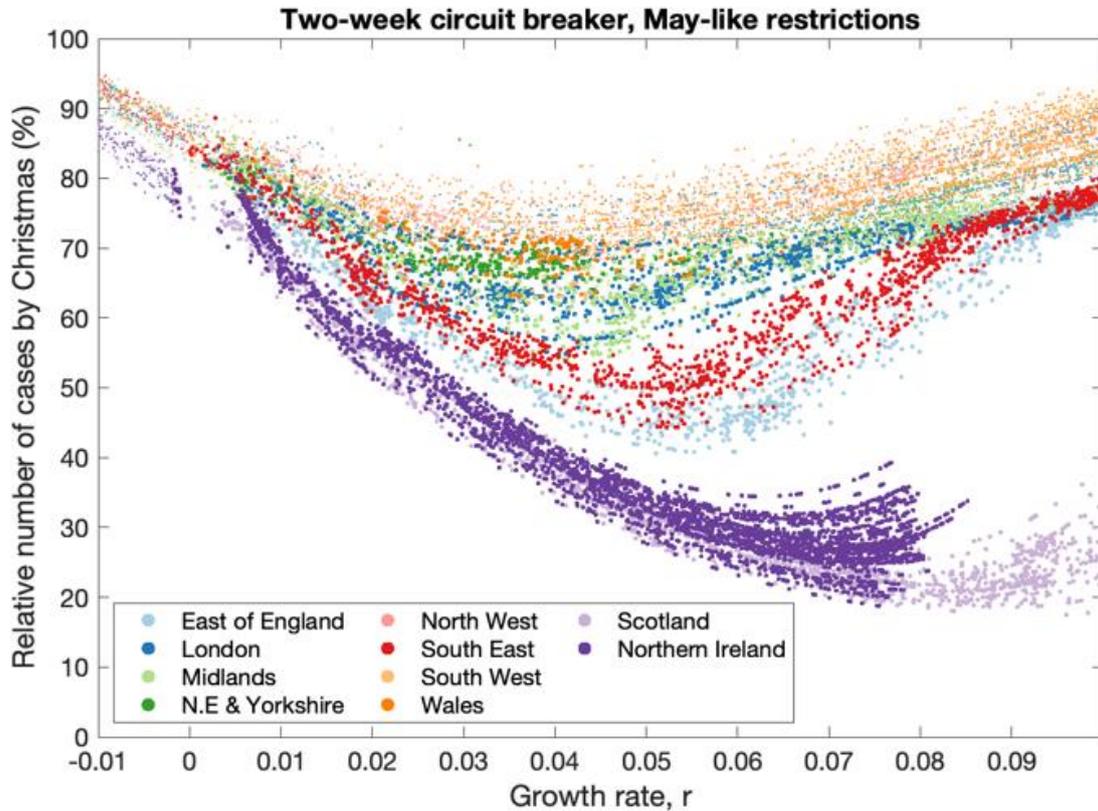
the current situation become more uncertain. This is exacerbated by changes in data streams. Consequently, SPI-M-O recommend that more weight be given to surveillance streams that have been set up for this purpose (ONS swabbing study and REACT study).

24. Modelling from the ONS swabbing survey for the most recent week of the study (4th to 10th September) estimates that an average of **59,800 people had COVID-19** in the community in England (credible interval 46,900 to 75,200), a marked increase compared to the previous week. In Wales, ONS estimate that an average of 1,500 people had COVID-19 during this period (credible interval 400 to 3,900). The study also estimates that, during the same week, there were **6,000 new infections per day in England**, with a credible interval of 4,200 to 8,300. This is approximately double their estimate for the previous week.

Circuit breakers – the impact of a time-limited intervention on transmission

25. SPI-M-O have considered the impact of "circuit breakers", where re-imposition of significant non-pharmaceutical interventions for two-weeks reduces the reproduction number below 1 resulting in reduced prevalence. Such measures have **the potential to substantially reduce cases, hospitalisations, and deaths**. Over a two week "break", two weeks of growth could be exchanged for two weeks of rapid decay in transmission, assuming good adherence to measures, and no additional increase in contacts before or after the break.

26. Work from one SPI-M-O group suggests a "stay at home" fortnight with restrictions similar to those in force in late May and a growth rate of around 4% could put the epidemic back by approximately 28 days. The amount of "time gained" is highly dependent on how quickly the epidemic is growing – the faster the growth or stricter the measures introduced, the more time gained.

27. Communication of these breaks would be complex as some measures, e.g. numbers of deaths, would not decline until after the break concluded.

28. Further preliminary analysis from the group suggests a two-week break of this type could potentially reduce the prevalence of infections seen at Christmas time by 25%-50%, under certain assumptions, and prevent or delay the need for "emergency" national total lockdown. The scale of any impact will depend on adherence.

Figure 2: Relative proportion of cases by Christmas if a two-week period of NPIs, similar to those in action in May, was implemented during October half term.

Impact of influenza and other respiratory viruses

29. SPI-M-O discussed the potential interactions of seasonal influenza and other respiratory viruses and infectious diseases with the current epidemic and measures to reduce transmission of SARS-CoV-2.

30. Commonalities in symptoms for influenza/influenza-like illnesses and COVID-19 may result in confusion over suspected cases for each disease, and increase burden on testing services.

31. If measures implemented in response to COVID-19 manage to control that virus, they are likely to disrupt influenza transmission over the winter months. However, children and thus schools play a larger role in transmission for seasonal influenza than for SARs-CoV-2. It is important to note that winter pressures are not limited to influenza.

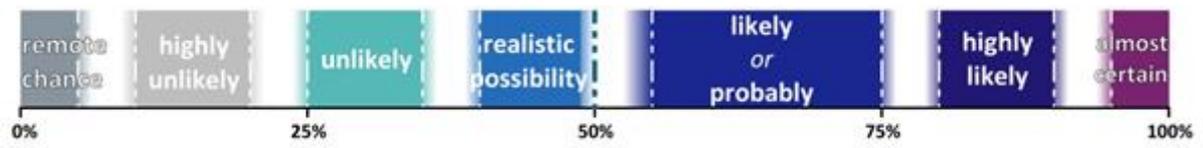## Annex: PHIA framework of language for discussing probabilities

| remote chance | highly unlikely | unlikely | realistic possibility | likely or probably | highly likely | almost certain |

0%   25%   50%   75%   100%

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	+3% to +7%
Scotland	1.1 – 1.4	+1% to +8%
Wales	0.7 – 1.2	-4% to +8%
Northern Ireland	1.0 – 1.5	+2% to +8%
UK	**1.1 – 1.4**	**+2% to +7%**

NHS England region	R	Growth rate per day
East of England	1.0 – 1.3	0% to +5%
London	1.1 – 1.4	+3% to +7%
Midlands	1.2 – 1.5	+4% to +8%
North East and Yorkshire	1.2 – 1.4	+3% to +8%
North West	1.2 – 1.5	+3% to +8%
South East	1.1 – 1.4	+3% to +7%
South West	0.9 – 1.6	0% to +9%

Figure 3: 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.
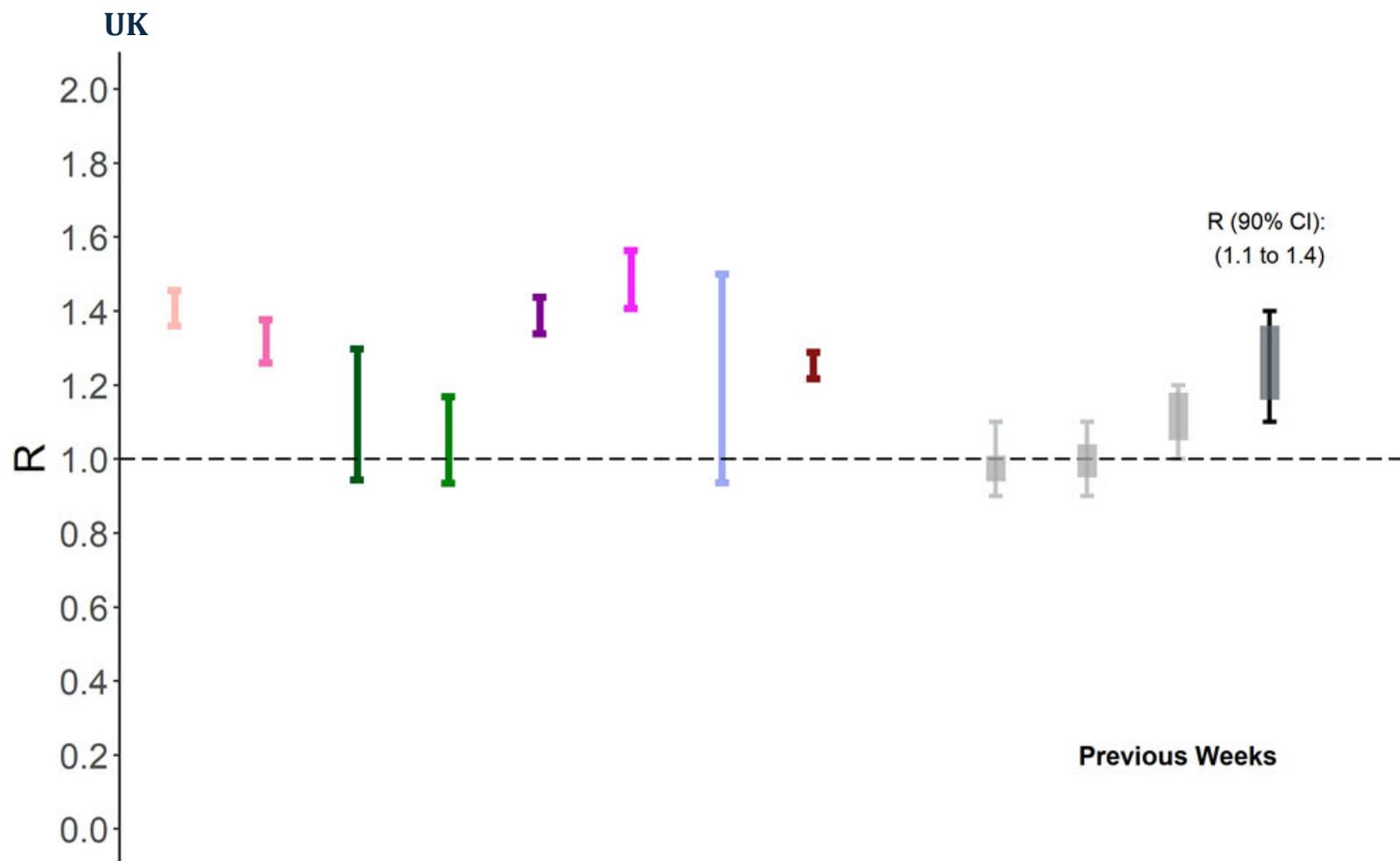
Figure 4: SPI-M-O groups estimates of median R in the four nations of the UK, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.
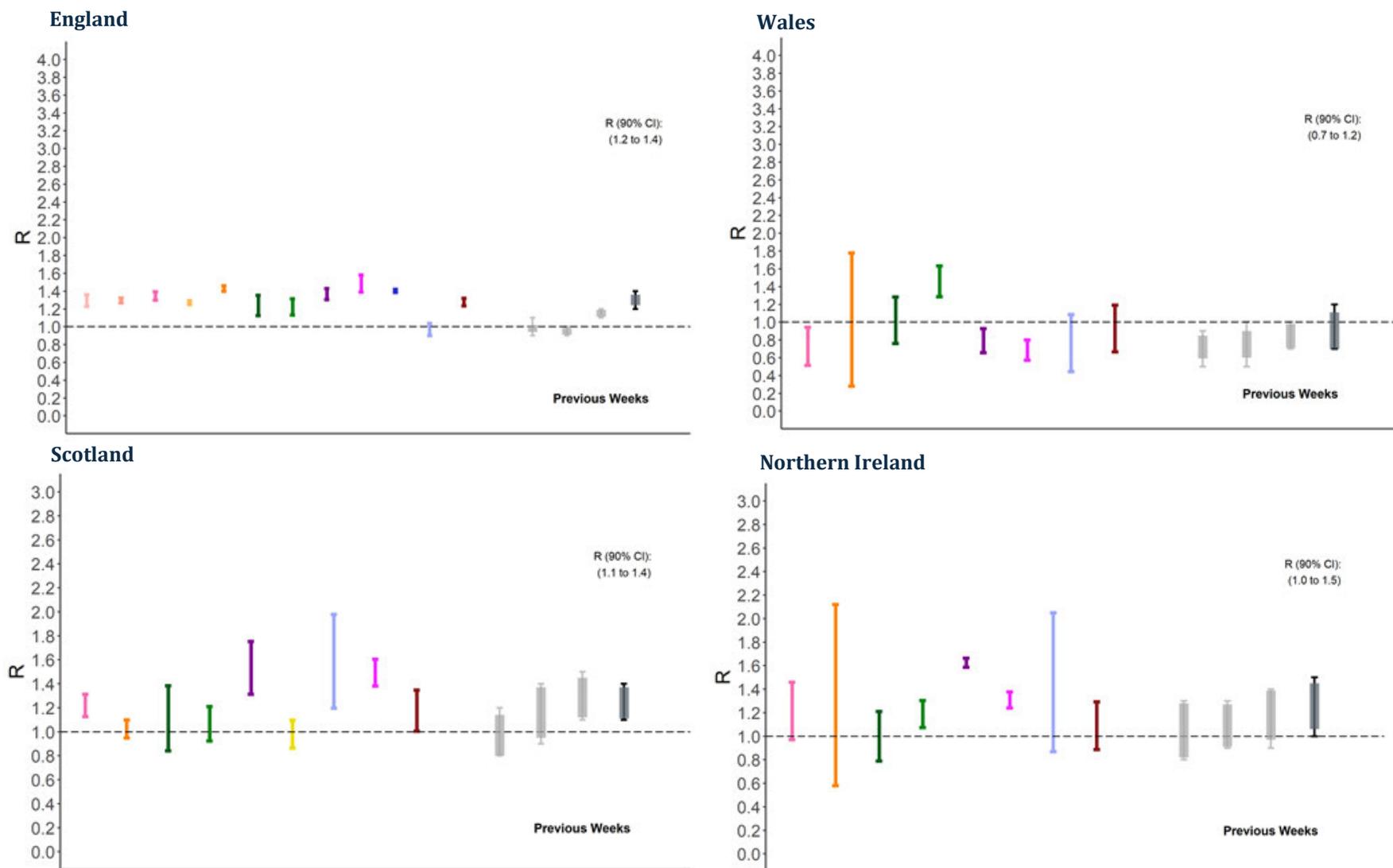
Figure 5: SPI-M-O groups estimates of the growth rate in NHS England regions, including 90% confidence intervals. Bars represent different modelling groups. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 2 decimal places.
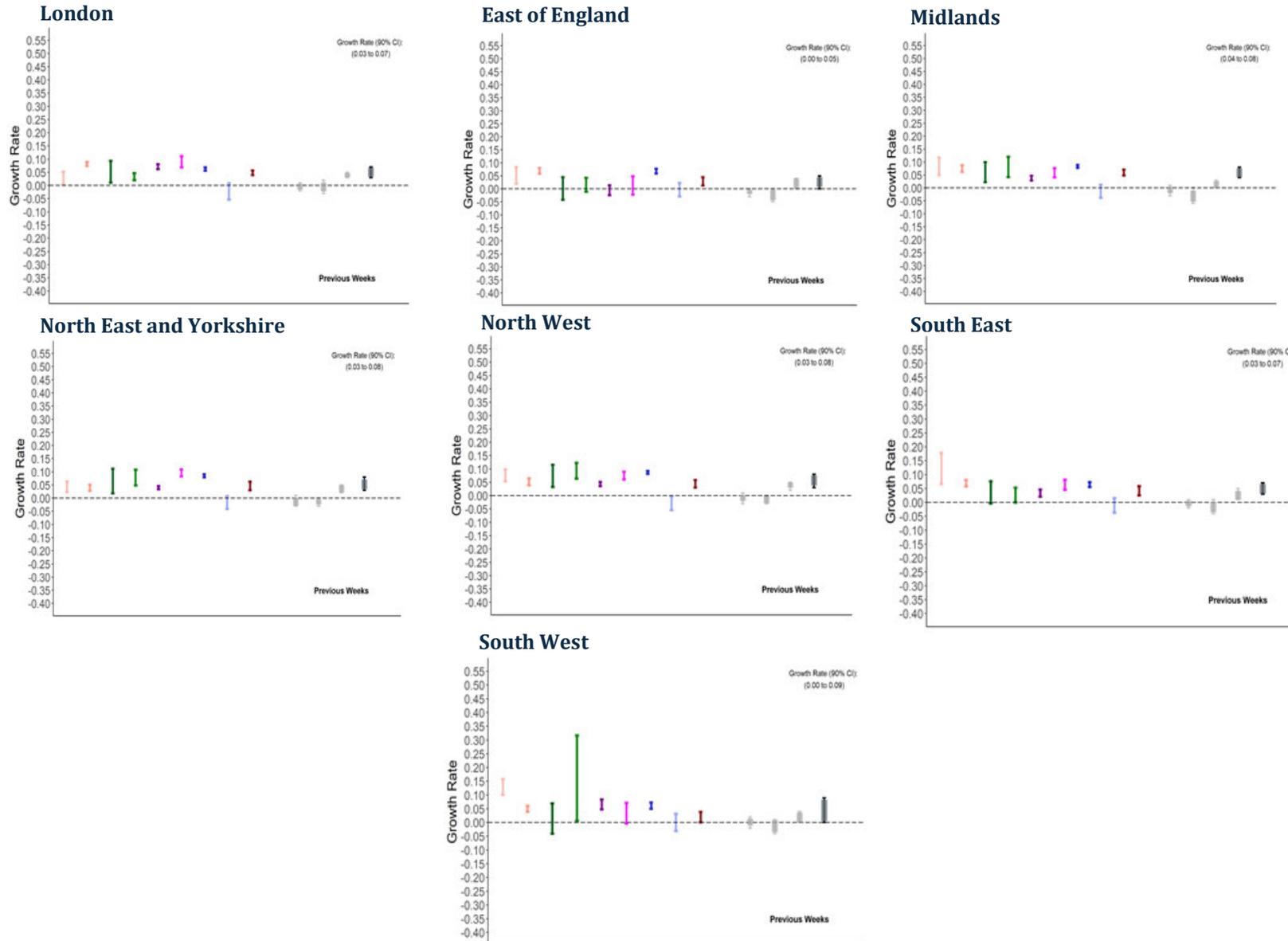
Figure 6: SPI-M-O groups estimates of median R in the NHS England regions, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.