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

***Date: 19th August 2020***

***FINAL- REISSUED 20TH AUGUST FOR CLARITY OF LANGUAGE***

## Summary

1. SPI-M-O's best estimate for **R in the UK is between 0.9 and 1.1**. This 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 of the country as a whole.

2. SPI-M-O's best estimate for **R in England is between 0.9 and 1.0**. Models that use pillar 2 testing data, a possible leading indicator for changes in transmission, continue to suggest higher values for R in England and several of its regions than those models using more lagged indicators, such as the number of deaths. As a result, **SPI-M-O do not have confidence that R is *currently* below 1 in England**. The higher estimate for R in the North West is potentially significant.

3. The growth rate records how quickly the number of infections is changing each day. SPI-M-O's consensus estimate is that **the growth rate per day in the UK is between -3% and +1% per day**. Care should be taken when interpreting R and growth rate estimates for the UK as this figure masks wide variation in the number of cases and pattern of how this is changing in different parts of the country.

4. The proportion of pillar 2 tests returning a positive result potentially provides an earlier indicator of changes in community transmission. Trends in these data, however, are difficult to interpret due to changes in testing behaviour and testing strategies, particularly in areas of local intervention where testing volumes have increased. Observation of the proportion of people testing positive in pillar 2 suggests that the epidemic has been growing at around **+3% per day over the past 2 weeks** in England (95% confidence interval +2% to +5%). We cannot tell how much of this growth represents a true increase in the number of infections, and how much arises from better targeting of pillar 2 testing at people who are infected.

5. **Care should be taken when interpreting the R and growth rate estimates for Scotland, Wales, Northern Ireland, London, East of England, North East and Yorkshire, and South West.** These estimates are based on low case numbers and / or

dominated by clustered outbreaks and so are insufficiently robust to inform policy decisions.

## Reproduction number

6. The reproduction number is the average number of secondary infections produced by a single infected individual. R is an average over time, geographies and communities. Whilst it varies in different geographies and settings of the population, separating transmission within and between these sub-populations increases uncertainty.

7. COVID-19 deaths and hospital admissions appear to be stable or slowly decreasing. In contrast, the number of cases being detected through testing has steadily increased over recent weeks; changes in testing behaviour and strategies, however, makes this trend difficult to interpret. **SPI-M-O's consensus estimates for R and growth rates are based on a range of models that use all these data sources,** and, as a result, may not fully reflect *recent* changes in transmission.

8. SPI-M-O's agreed national estimates of R are summarised in **Table 1** and **Figures 1 and 2**. SPI-M-O's best estimate for **the UK is that R is between 0.9 and 1.1**. The previous three consensus estimates of R have been included to show the trend in the estimates.

9. SPI-M-O's best estimate for **R in England is between 0.9 and 1.0**. However, SPI-M-O **do not have confidence that R is *currently* below 1 in England**. Models that use pillar 2 testing data, a likely leading indicator for changes in transmission, suggest higher values for R in England and several of its regions than models that use more lagged indicators, such as deaths.

## Growth rates

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].

[1] The growth rate λ is the exponent of the exponential curve $y = e^{\lambda t}$, where $y$ is the number of new infections, and $t$ is time, given in days. It is approximately the change per day (so λ=-0.04 corresponds to a 4% decline in cases per day).

11. SPI-M-O's consensus estimate is that the growth rate per day in the UK is between **-3% to +1% per day**. SPI-M-O's national estimates of growth rates are summarised in **Table 1**.

12. 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 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 growing at around **+3% per day over the past 2 weeks in England (95% confidence interval +2% to +5%)**. We cannot tell how much of this growth represents a true increase in the number of infections, and how much arises from better targeting of pillar 2 testing at people who are infected, for example populations with higher prevalence.

13. Rounding and differences between the data streams used in the models included in the combinations account for differences between estimates of R and estimated growth rates. Such variation highlights the importance of applying judgement when using these metrics.

## Regional variation and reliability

14. Estimates of R at regional levels are subject to the same difficulties in interpretation as national estimates, and these are amplified due to the smaller numbers of cases.

15. As with nation level estimates, models that use pillar 2 testing data suggest higher values for R in several NHS England regions than those models that use more lagged indicators, such as the number of deaths.

16. Consensus estimates for the regional growth rates per day in England are also given in **Table 1** and **Figure 3**. For completeness, consensus regional estimates of R for England are given in **Table 1** and **Figure 4**; some of the ranges of R include 1.

17. Note that the estimate for the North West region is assessed as robust and continues to include a range which encompasses values of R that are greater than 1.

18. SPI-M-O's view is that **care should be taken when interpreting the R and growth rate estimates for: Scotland, Wales, Northern Ireland, London, East of England, North East and Yorkshire, and South West.** This is because these estimates are based on low case numbers and / or clustered outbreaks. SPI-M-O does not have confidence that these R estimates are sufficiently robust to inform national/regional policy decisions, either

because case numbers have fallen to low levels, there is variability in estimates from different data streams, or there is a high degree of variability in transmission, for example, due to a localised outbreak.

19. Care should also be taken when interpreting the R and growth rate estimates for the UK. These figures mask wide variation in the number of cases and patterns of how transmission is changing in different parts of the country.

## Incidence

20. Combined estimates from four SPI-M-O models give a 90% confidence interval of **1,000 – 4,000 new infections per day** in England.

21. Data from the ONS swabbing survey for the most recent week of the study (7th August to 13th August) estimates that an average of **24,600 people** were positive for SARS-CoV-2 in the community in England (credible interval 16,900 to 33,800). In Wales, ONS estimate that an average of 1,300 people would have tested positive for SARS-CoV-2 during this period (confidence interval 400 to 2,900). The study also estimates that, during the same week, there were **2,400 new infections per day in England**, with a credible interval of 1,200 to 4,200. Although the ONS survey can directly estimate incidence, it is based on a very small number of positive tests. The ONS data remain broadly flat, in line with SPI-M-O's estimates of R.

## Testing for release from household isolation

22. The SPI-M-O consensus statement and accompanying paper from SAGE 42 (18 June 2020) found that serial testing strategies had potential to reduce the duration of quarantine, both for contacts of a known index case self-isolating under test and trace, and for those under travel quarantine.

23. Additional analyses from two SPI-M-O modelling groups have explored strategies for the release of test and trace cases from household isolation further, focusing on the effectiveness of single tests. Both papers support the notion that testing could reduce the isolation period of traced contacts of an index case.

24. Analysis from LSHTM suggests that a 10-day household isolation period with testing on day 9 would result in transmission potential of an infected contact that is only slightly higher than under a 14-day isolation with no test. Using different modelling assumptions, PHE draw the same conclusion about testing at day 8.

25. Having another, earlier test would additionally improve detection of secondary infections. A greater proportion of the infections amongst contacts would be detected and contact tracing of these secondary cases could be begun earlier than relying on the day 8 test. In that respect a two-stage test would add power to the test & trace system by detecting more secondary case transmissions and allowing tracing of contacts of these cases; with the late test giving minimising the risk of infected contacts escaping undetected from the isolation period.

26. Reducing delays in the contact tracing system (identification of index cases and contacts, time to test cases and receive results) is essential to the feasibility of shorter isolation periods.

27. Both papers echo previous conclusions that testing immediately after identification of a case has minimal effectiveness.

28. Both analyses assume perfect adherence to isolation by index cases and their contacts, which is unachievable in reality. The optimal testing strategy will depend on compliance. A shorter isolation period may be preferable if it increases the numbers who are willing to isolate in the first place. As such, information on current levels of compliance to isolate and the public's willingness to isolate for differing lengths of time would be invaluable.

29. Given that self-isolation and quarantine are the main methods of control of transmission (alongside reduction in contact and reduction in risk of transmission of contacts), improving compliance should be a principal target.

## Testing and tracing data

30. SPI-M looks forward to a time when detailed test and trace data will be available to inform the national modelling effort. The pillar 1 and 2 testing data are available and informative. They would be substantially more informative if they included the reason the subject had come for a test – this is critical information for interpretation of the incidence of positive tests.

## Annex: PHIA framework of language for discussing probabilities

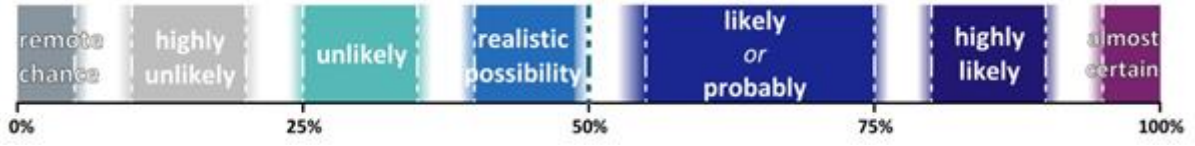

**Table 1:** Combined estimate of R and the growth rate in the UK, four nations and English NHS regions (90% confidence interval)

| Nation | R | Growth rate per day |
|---|---|---|
| **England** | 0.9 – 1.0 | 0% to -3% |
| **Scotland*** | 0.8 – 1.2 | +2% to -6% |
| **Wales*** | 0.7 – 1.0 | -1% to -6% |
| **Northern Ireland*** | 0.7 – 1.2 | +3% to -6% |
| **UK†** | **0.9 – 1.1** | **+1% to -3%** |

| NHS England region | R | Growth rate per day |
|---|---|---|
| **East of England*** | 0.8 – 1.0 | 0% to -3% |
| **London*** | 0.9 – 1.1 | +1% to -2% |
| **Midlands** | 0.8 – 1.0 | 0% to -4% |
| **North East and Yorkshire*** | 0.8 – 1.0 | 0% to -4% |
| **North West** | 0.9 – 1.1 | +1% to -2% |
| **South East** | 0.8 – 1.0 | 0% to -4% |
| **South West*** | 0.8 – 1.1 | +2% to -1% |

*****Care should be taken when interpreting these estimates as they are based on low incidence and/or clustered outbreaks within this area.
† 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 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.

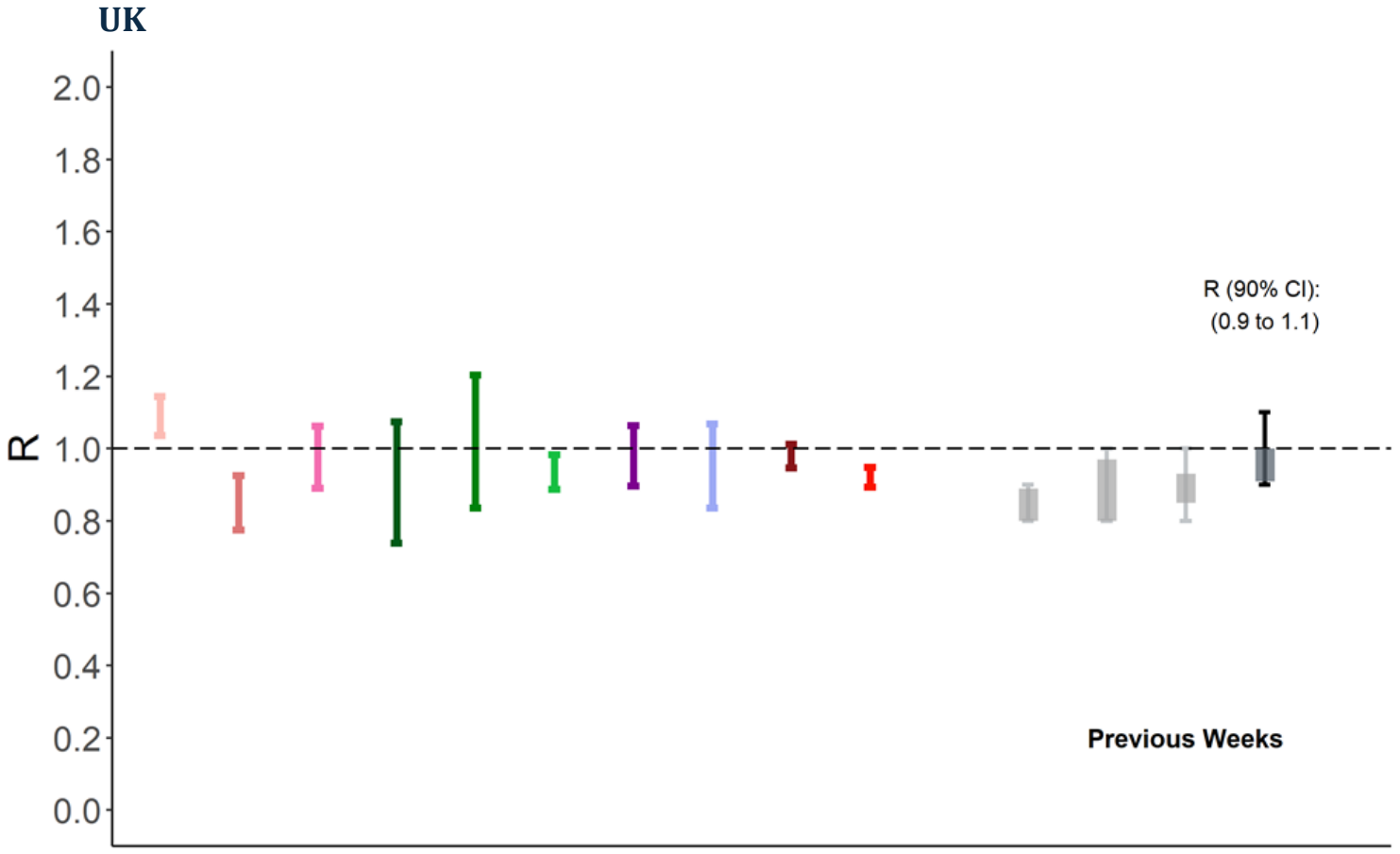

**Figure 2:** SPI-M-O groups estimates of median R in the four nations of the UK, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.

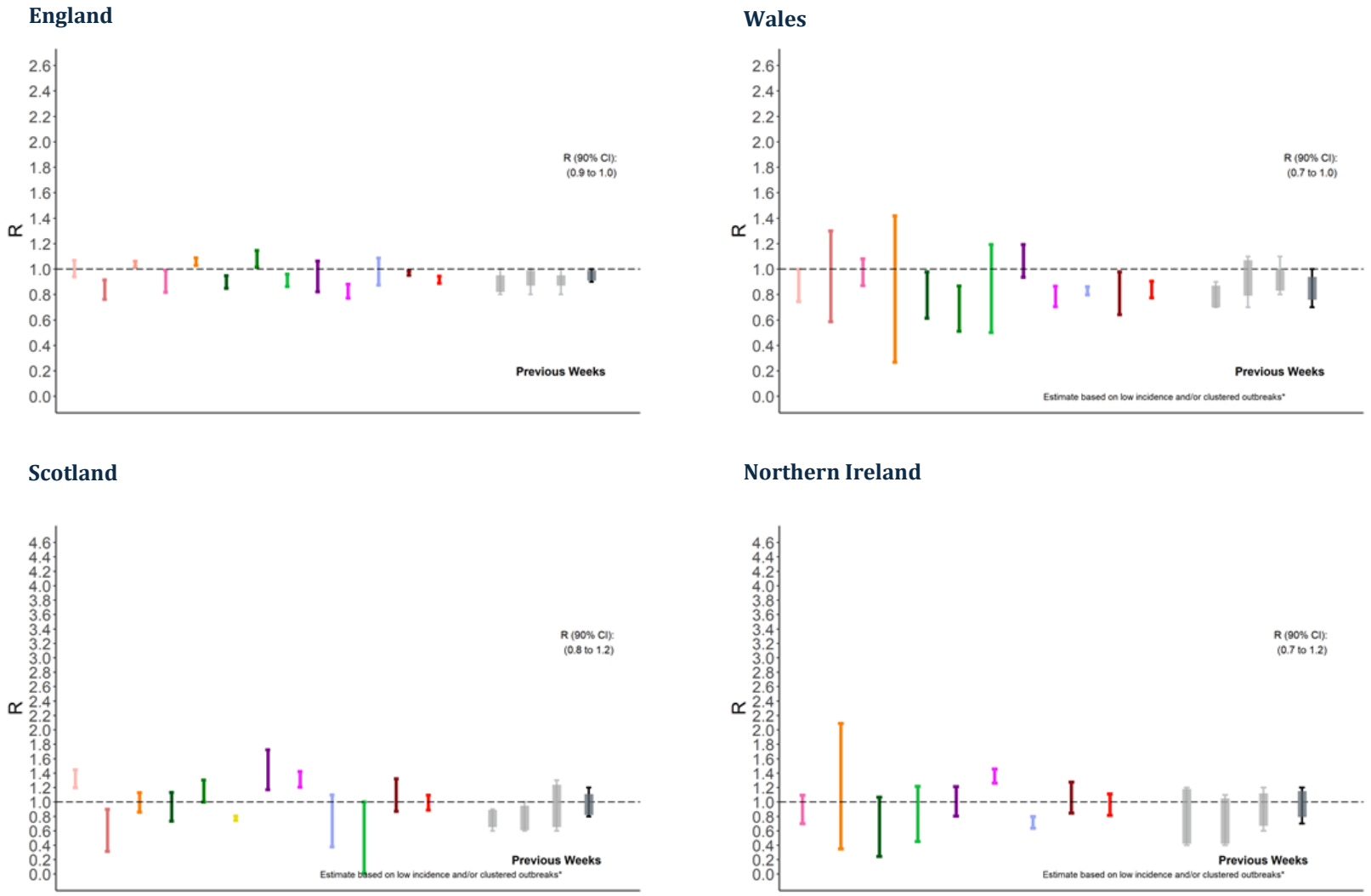

**Figure 3:** SPI-M-O groups estimates of the growth rate in NHS England regions, including 90% confidence intervals. Bars represent different modelling groups. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 2 decimal places.

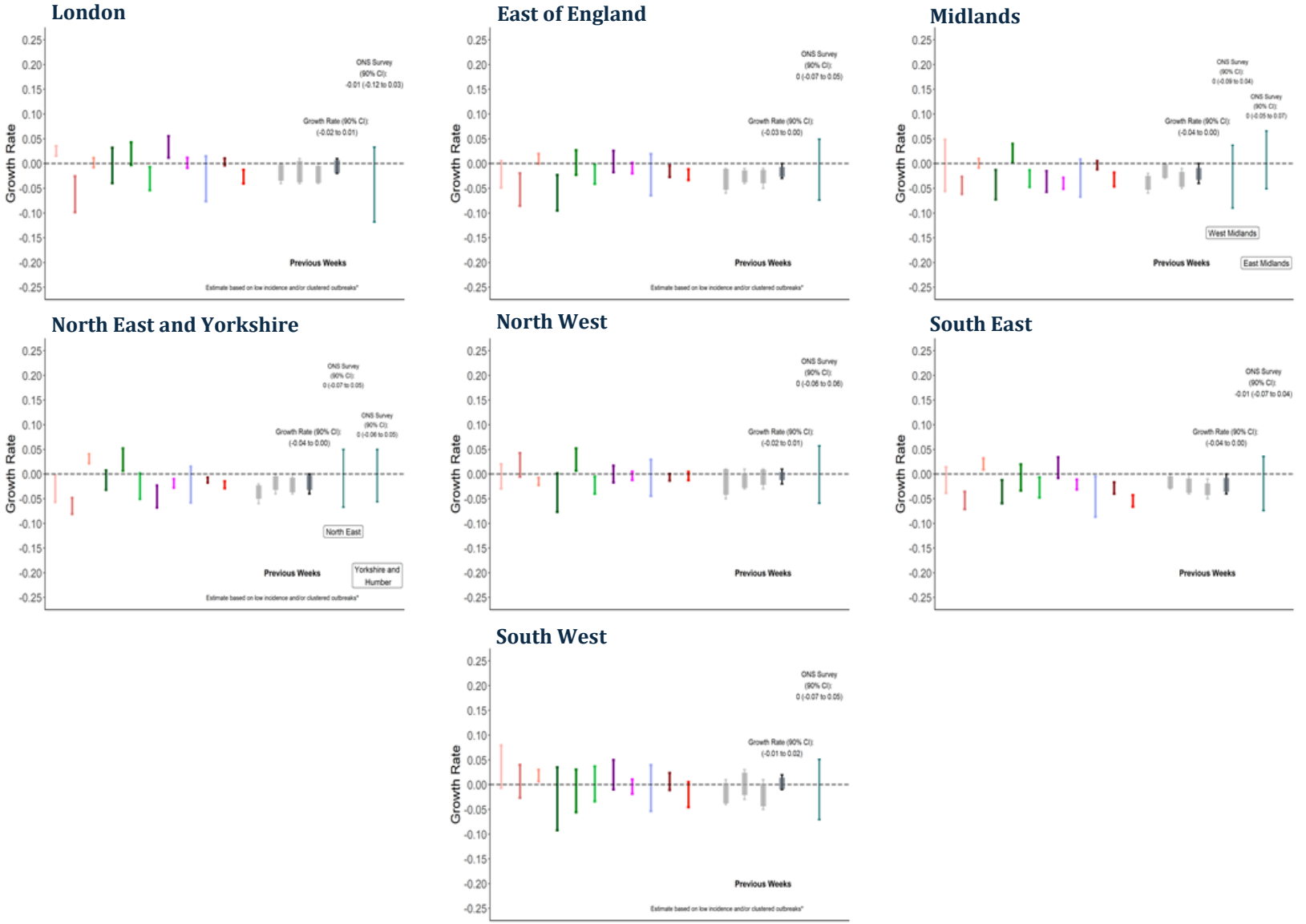

**Figure 4:** SPI-M-O groups estimates of median R in the NHS England regions, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.