

### **Note added for publication**

*This paper includes estimates of the change in pillar 2 test positivity in England. Please note that trends in this data are difficult to interpret due to changes in testing behaviour and testing strategies, particularly in areas of local intervention where testing volumes have increased.*

*We cannot currently tell how much of the estimated change in pillar 2 positivity represents a true change in the number of infections, and how much arises from changes in targeting of pillar 2 testing towards (or away from) people who are infected, for example populations with higher or lower prevalence.*

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

**Date: 12<sup>th</sup> August 2020**

**FINAL: SIGNED OFF BY SPI-M-O CO-CHAIR ON BEHALF OF SPI-M-O**

### **Summary**

1. SPI-M-O's best estimate for **R in the UK is between 0.8 and 1.0**. 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 0.8 and 1.0**. Models that use pillar 2 testing data, a possible leading indicator for changes in transmission, 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**. This is particularly the case for the North West.
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 -4% 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 a more timely 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 shrinking at around **-2% per day over the past 2 weeks** in England (95% confidence interval -1.1% to -3.1%).

5. **Care should be taken when interpreting the R and growth rate estimates for Scotland, Wales, Northern Ireland, London, North East and Yorkshire, Midlands 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. Uncertainty in R increases as the number of infections decreases. 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 0.8 and 1.0**. The previous three consensus estimates of R have been included to show the trend in the estimates.
9. 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<sup>1</sup>.

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<sup>1</sup> The growth rate  $\lambda$  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  $\lambda = -0.04$  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 **-4% 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 a more timely 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 shrinking at around **-2% per day over the past 2 weeks in England (95% confidence interval -1% to -3%)**, in line with SPI-M's estimated range.
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. R becomes an unreliable measure for informing policy when case numbers fall 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. 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, North East and Yorkshire, Midlands 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.

20. Care should also be taken when interpreting the R and growth rate estimates for the UK. This figure masks wide variation in the number of cases and pattern of how this is changing in different parts of the country.

### Incidence

21. Combined estimates from five SPI-M-O models give a 90% confidence interval of **1,000 – 4,000 new infections per day** in England.
22. Data from the ONS swabbing survey for the most recent week of the study (3rd August to 9th August) estimates that an average of **28,300 people** were positive for SARS-CoV-2 in the community in England (confidence interval 19,000 to 40,700). In Wales, ONS estimate that an average of 1,500 people would have tested positive for SARS-CoV-2 during this period (confidence interval 400 to 3,500). The study also estimates that, during the same week, there were **3,800 new infections per day**, with a confidence interval of **2,300 to 5,900**. Although the ONS survey can directly estimate incidence, it is based on a very small number of positive tests.

### Compliance with self-isolation and quarantine

23. The impact of both self-isolation of people with confirmed COVID-19 and their contacts will depend critically on compliance rates. It is very important for studies to be undertaken to determine how compliance varies with the length of this isolation period, strategies to test contacts of confirmed cases, and practical incentives for isolation.

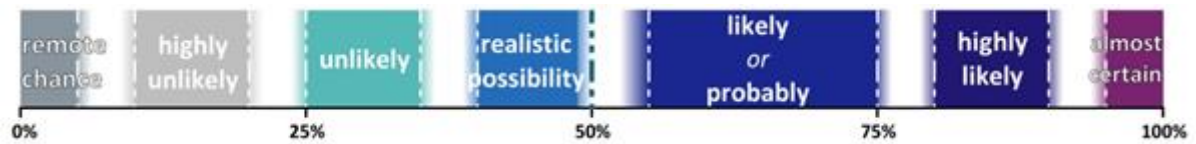
### Elimination of SARS-CoV-2 in the UK

24. Modelling from one SPI-M-O group suggests it would take at least a year to achieve elimination of SARS-CoV-2 in the UK. This is primarily dependent on the prevalence of infection and the social distancing measures in place, which determine the reproduction number, which has to be kept below 1 for elimination to occur. Suppression of clusters and targeted interventions for hard-to-reach groups would also be required.
25. SPI-M-O's view is that it would be highly likely that elimination would only be a transient state, as recent cases of community transmission in New Zealand and Vietnam have shown how difficult maintaining elimination would be. In general, it will be easier to achieve and maintain elimination in countries with smaller populations and lower levels of connectivity to the rest of the world. The UK is far more interconnected both internally within the country and internationally than either of New Zealand or Vietnam.

26. The public health benefits of zero cases versus very low incidence are small, but the costs (in terms of the impact of social distancing measures) of achieving and maintaining zero cases are much larger.

27. Despite the difficulties of elimination, the lower incidence becomes, the easier it will be to keep the virus under control using testing, tracing, and local interventions.

### Annex: PHIA framework of language for discussing probabilities



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

<b>Nation</b>	<b>R</b>	<b>Growth rate per day</b>
<b>England</b>	0.8 – 1.0	0% to -4%
<b>Scotland*</b>	0.6 – 1.3	+3% to -7%
<b>Wales*</b>	0.8 – 1.1	+1% to -4%
<b>Northern Ireland*</b>	0.6 – 1.2	+1% to -10%
<b>UK†</b>	<b>0.8 – 1.0</b>	<b>-1% to -4%</b>

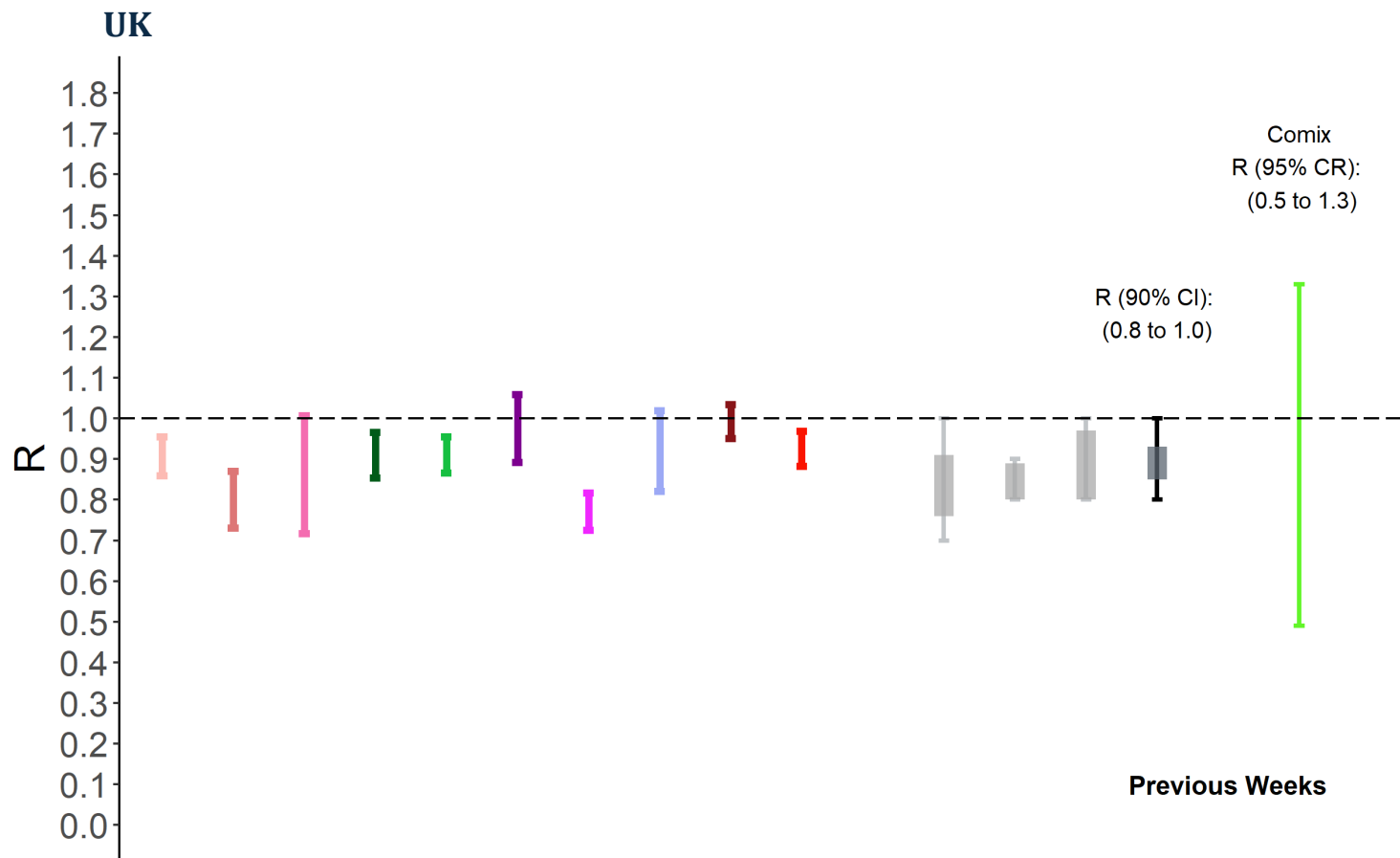
<b>NHS England region</b>	<b>R</b>	<b>Growth rate per day</b>
<b>East of England</b>	0.8 – 1.0	-1% to -5%
<b>London*</b>	0.8 – 1.0	0% to -4%
<b>Midlands*</b>	0.8 – 1.0	-1% to -5%
<b>North East and Yorkshire*</b>	0.8 – 1.0	0% to -4%
<b>North West</b>	0.8 – 1.1	+1% to -3%
<b>South East</b>	0.8 – 0.9	-1% to -5%
<b>South West*</b>	0.8 – 1.0	+1% to -5%

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

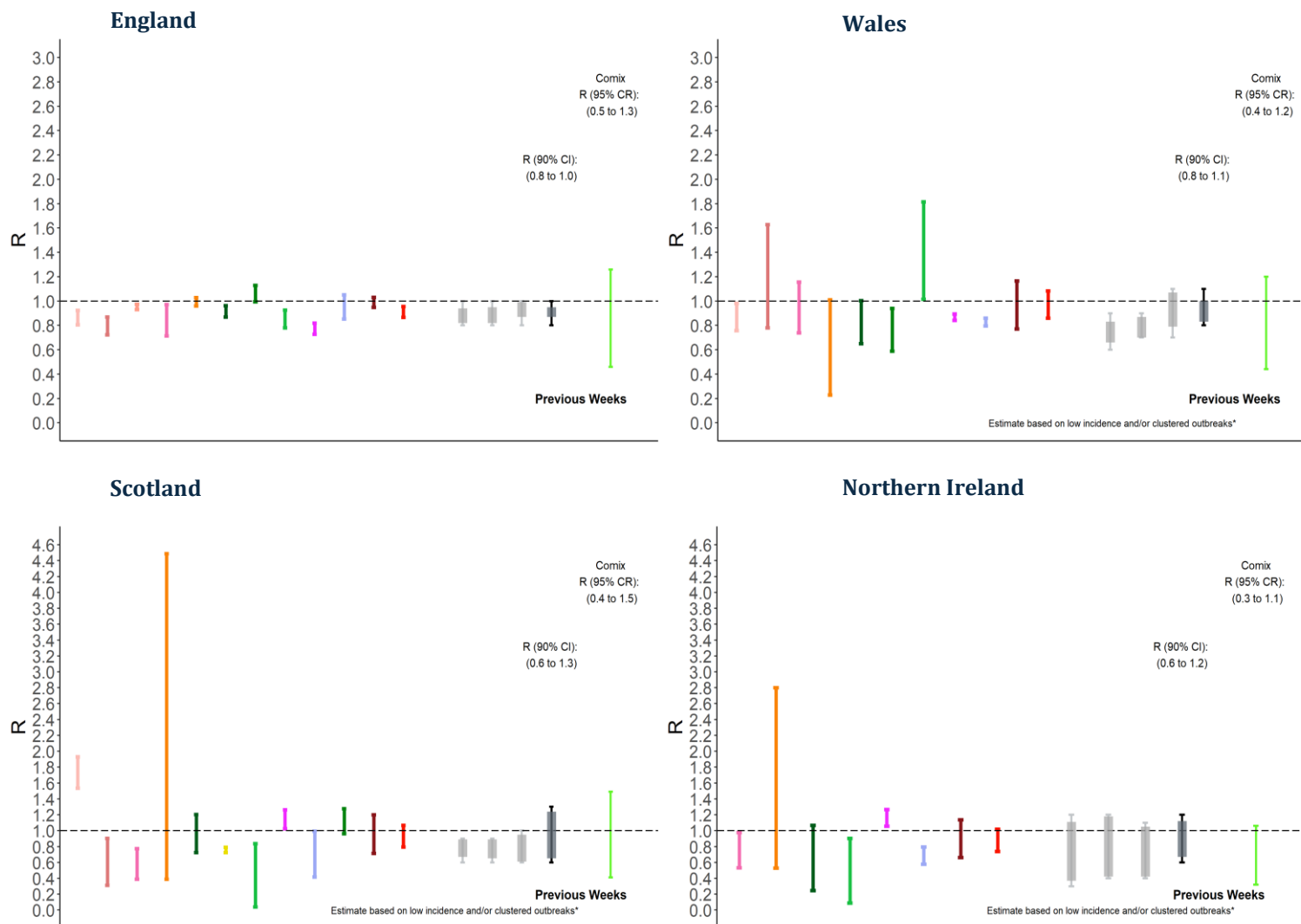
† The UK estimate of R is the average over very different epidemiological situations and should be regarded as a guide to the general trend rather than a description of the epidemic state.

**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.

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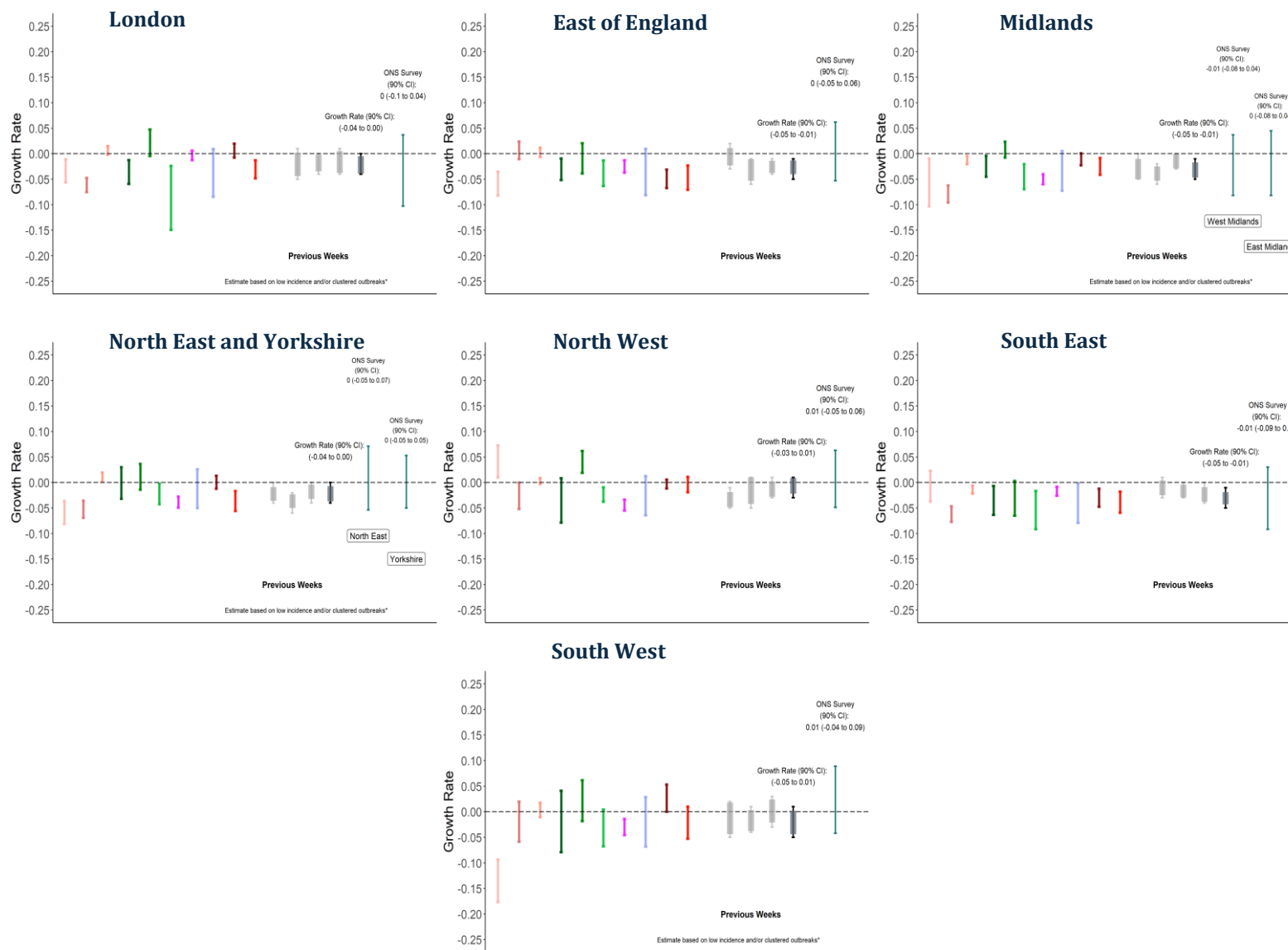


**Figure 2:** SPI-M-O groups estimates of median R in the four nations of the UK, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.





**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.

