

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

*Date: 25<sup>th</sup> November 2020*

**FINAL – SIGNED OFF BY CO-CHAIRS ON BEHALF OF SPI-M**

## Summary

1. SPI-M-O's best estimate for **R in both the UK and England is between 0.9 and 1.0**. Estimates of R for Scotland, Wales and Northern Ireland are between 0.8 and 1.0. R is a lagging indicator and these estimates are based on the latest data available up to 24<sup>th</sup> November.
2. SPI-M-O estimate that there are between **41,000 and 70,000 new infections per day in England**.
3. R and growth rates have fallen slightly in recent weeks and all NHS England regions have decreased compared to last week. For the North West, the R estimates are securely below 1. For all other regions, the R estimates are close to one, with the ranges including 1.
4. The delay between initial infection, developing symptoms, the need for hospital care, and death means that **the impact of the national restrictions introduced in England on 5<sup>th</sup> November are only beginning to be observed from this week**. Due to these lags in epidemic processes, the national restrictions cannot yet be **fully** evaluated. R estimates for England may continue to decline in the future and *may* be below 1 for all regions and nations already.
5. Initial estimates suggest R has reduced across all NHS England regions and growth rates have turn negative in many of these, suggesting that the epidemic is shrinking but slowly.
6. SPI-M-O has been projecting the course of the epidemic in the medium term for several weeks now, and comparisons to subsequent actual data are shown later in this document.

## Incidence and prevalence

7. Combined estimates from six SPI-M-O models, using data available up to 24<sup>th</sup> November, suggest there are between **41,000 and 70,000 new infections per day in England**. This is a marginally lower range than last week's estimate.
8. Modelling from the ONS community infection survey for the most recent week of the study (15<sup>th</sup> to 21<sup>st</sup> November) estimates that an average of **633,000 people had COVID-19** in the community in England (credible interval 599,200 to 668,200) – this is marginally lower

than their estimate for the previous week. The equivalent estimates for the devolved administrations are:

England	633,000 (credible interval 599,200 to 668,200)
Scotland	45,700 (credible interval 35,000 to 58,100)
Wales	16,400 (credible interval 10,500 to 23,900)
Northern Ireland	12,700 (credible interval 8,100 to 18,600)

## Reproduction number and growth rate

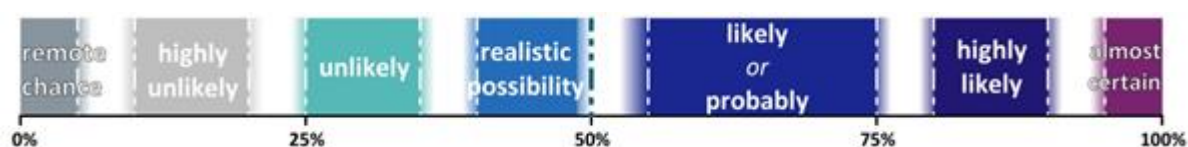
9. The reproduction number is the average number of secondary infections produced by a single infected individual. R is an average value over time, geographies, and communities. This should be considered when interpreting the R estimate for the UK given the differences in policies across the four nations.
10. **SPI-M-O's best estimate for R in the both the UK and England is between 0.9 and 1.0. Estimates of R for Scotland, Wales and Northern Ireland are all 0.8-1.0.** R is a lagging indicator and these estimates are based on the latest data available up to 24<sup>th</sup> November. SPI-M-O's agreed national and regional estimates are summarised in Table 1 and Figures 1, 2, and 4.
11. The epidemic in the North West and North East and Yorkshire NHS England regions is now shrinking, with R estimated as 0.7-0.9 and 0.8-1.0 respectively. Incidence and prevalence in these regions, however, remain high with associated healthcare demand and mortality.
12. Only two NHS England regions, London and the South East, have R estimates with an entire range at or above 1.0 (1.0-1.1 and 1.0-1.2 respectively). Although SPI-M-O's estimates of R for these regions are above 1, the delay between recent trends and reflection in the latest data means R estimates may continue to decline in the future and *may* be below 1 for all regions already.
13. 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. This means that **we cannot yet fully evaluate the impact of the national restrictions introduced in England on 5<sup>th</sup> November.** While R has decreased from the levels estimated in previous weeks, it may continue to fall due to this lag.

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<sup>1</sup>.
15. SPI-M-O's consensus estimate is that the **growth rate in the UK is between -2% to 0% per day**. The growth rate estimate for **England is between -2% to +1%**<sup>2</sup>. SPI-M-O's national and regional estimates of growth rates are summarised in Table 1 and Figure 3. As the epidemic curve is very close to flat, doubling times (or halving times) are not meaningful.

### Medium term projections compared to outturn data

16. SPI-M-O have now been producing six-week medium term projections for several weeks and it is now possible to compare these retrospectively with what happened after the projections were produced.
17. SPI-M-O's projections from each of the four weeks in October for deaths and hospitalisations in England can be seen in Figures 5 and 6 respectively (*NB: log scale*). At the time these projections were produced, they did not take into consideration any effects of planned policy or behavioural changes, or any past changes that were yet to be reflected in the data; they were solely based on observable trends at the time they were produced. In general, the outturn data follows SPI-M-O's medium-term projections reasonably well, particularly for the earlier weeks.
18. As more interventions have been implemented, the projections have begun to diverge from the outturn data further. These projections have always been based on the data available at the time, and so could not have included the full impact of the tiers system or national measures introduced in England.

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



<sup>1</sup> Further technical information on the growth rate can be found in [Plus magazine](#).

<sup>2</sup> The estimate intervals for R and growth may not exactly correspond to each other due to the submission of different independent estimates and rounding in presentation.

**Table 1:** Combined estimate of R and the growth rate in the UK, four nations and NHS England regions (90% confidence interval)<sup>3</sup>

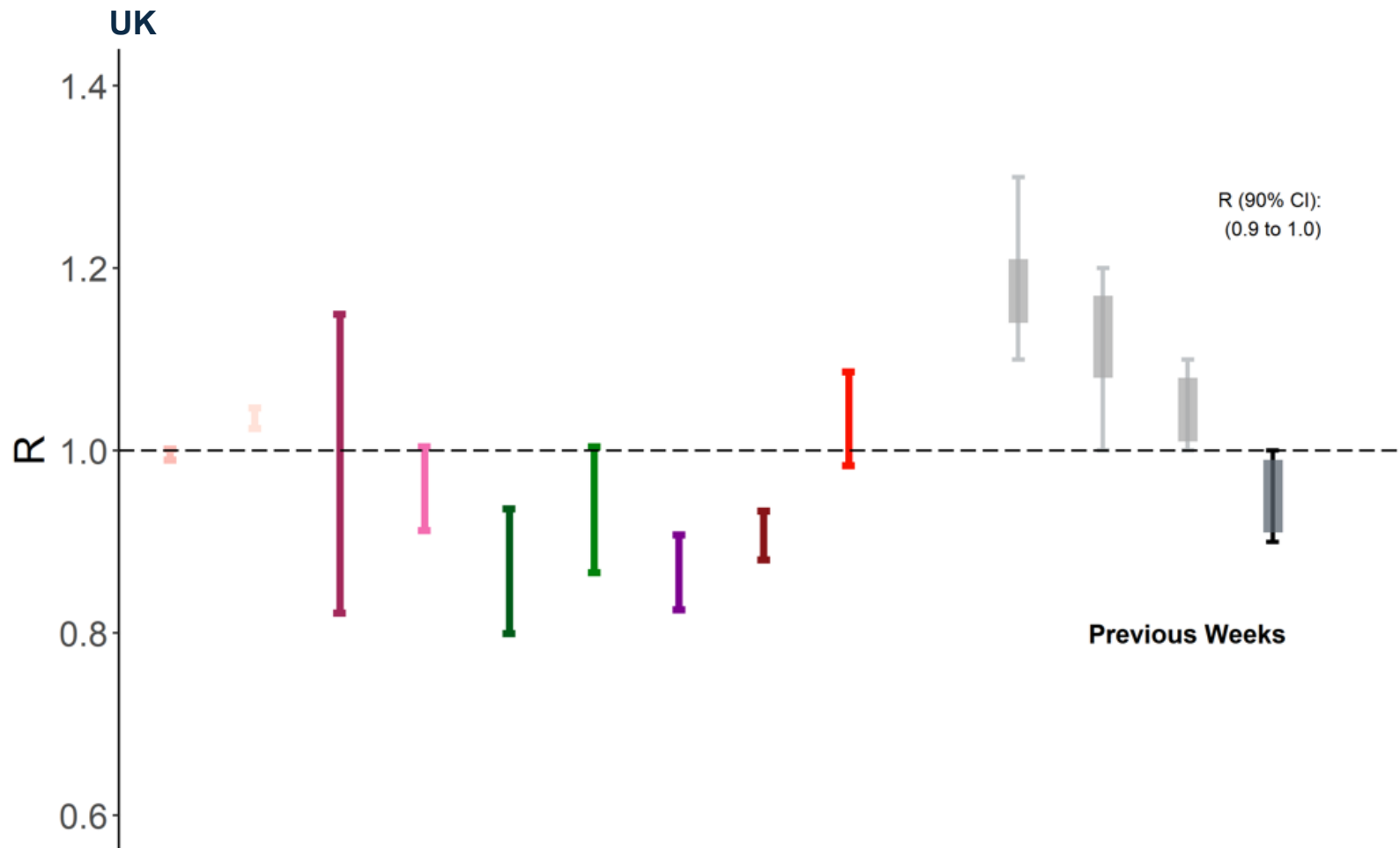
<b>Nation</b>	<b>R</b>	<b>Growth rate per day</b>
England	0.9 – 1.0	-2% to +1%
Scotland	0.8 – 1.0	-3% to 0%
Wales	0.8 – 1.0	-3% to +1%
Northern Ireland	0.8 – 1.0	-3% to 0%
<b>UK</b>	<b>0.9 – 1.0</b>	<b>-2% to 0%</b>

<b>NHS England region</b>	<b>R</b>	<b>Growth rate per day</b>
East of England	0.9 – 1.1	-1% to +2%
London	1.0 – 1.1	0% to +2%
Midlands	0.9 – 1.1	-2% to +1%
North East and Yorkshire	0.8 – 1.0	-3% to 0%
North West	0.7 – 0.9	-5% to -2%
South East	1.0 – 1.2	0% to +3%
South West	0.9 – 1.1	-2% to +2%

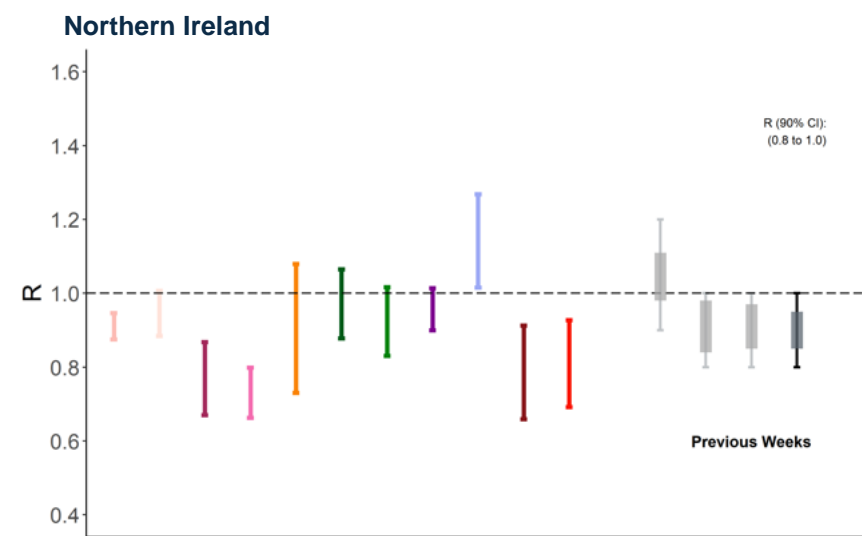
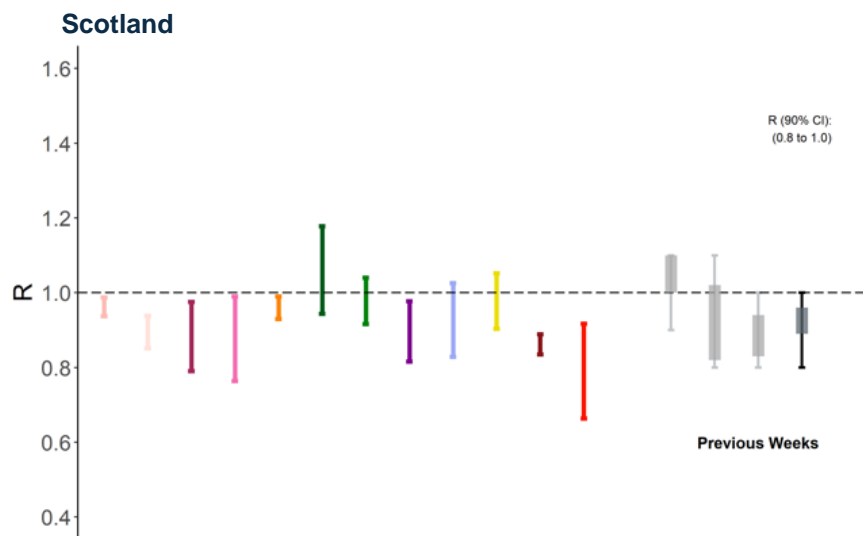
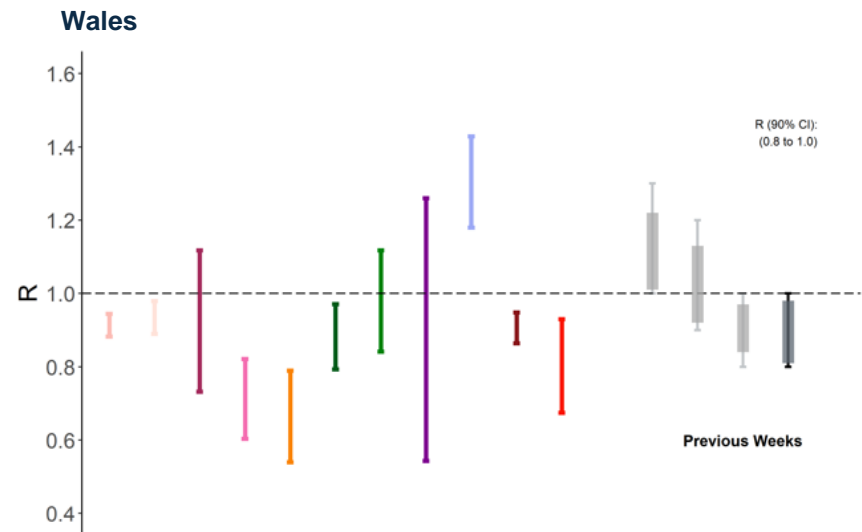
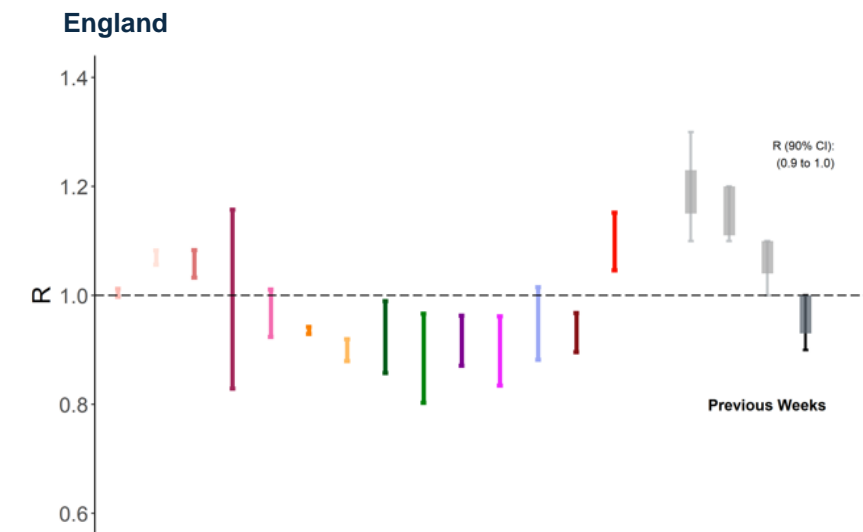
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<sup>3</sup> The estimate intervals for R and growth may not exactly correspond to each other due to the submission of different independent estimates and rounding in presentation.

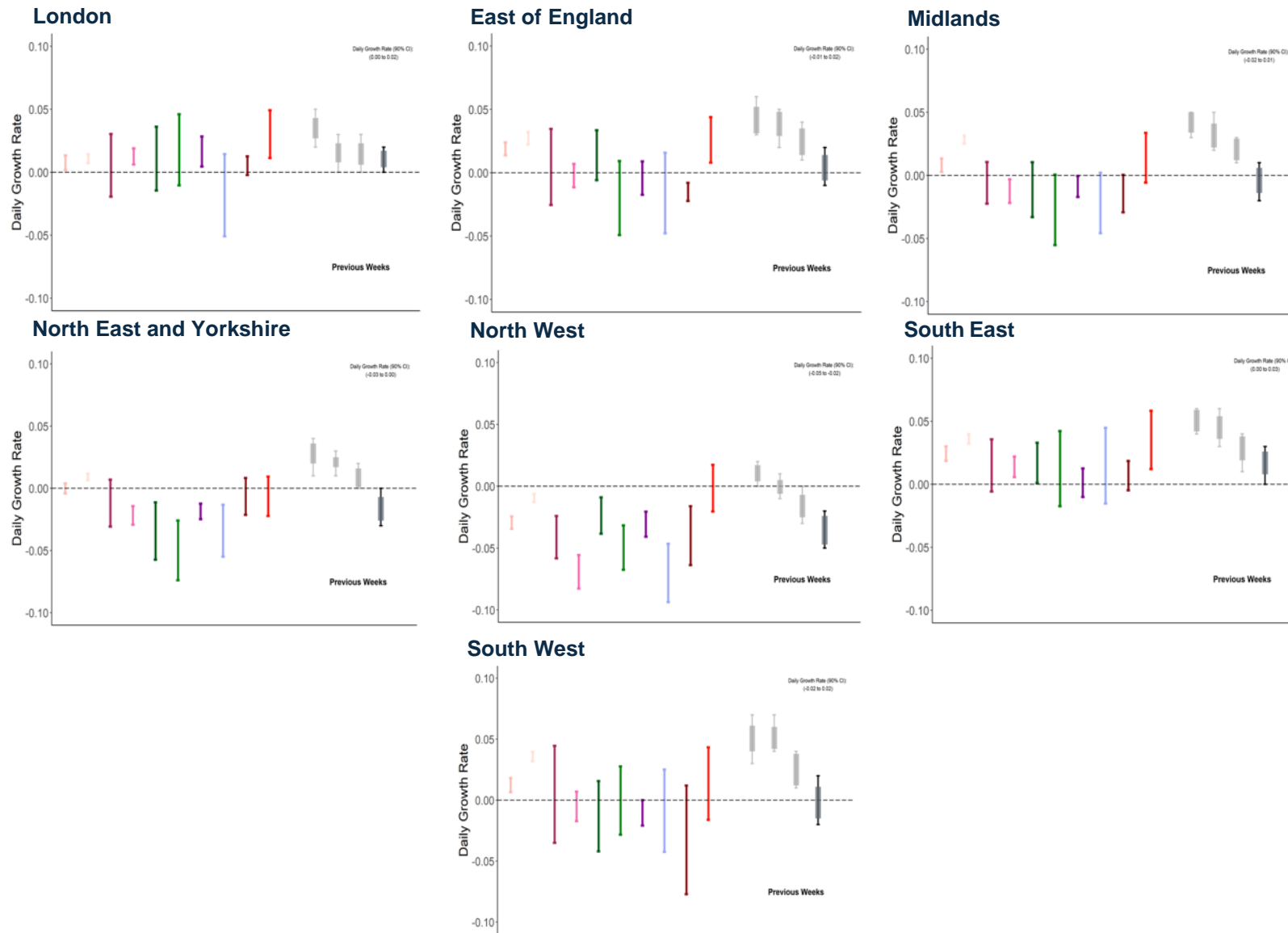
**Figure 1:** SPI-M-O groups' estimates of median R in the UK, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded area represents the combined numerical range and the black bar is the combined range after rounding to 1 decimal place. The UK estimate of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



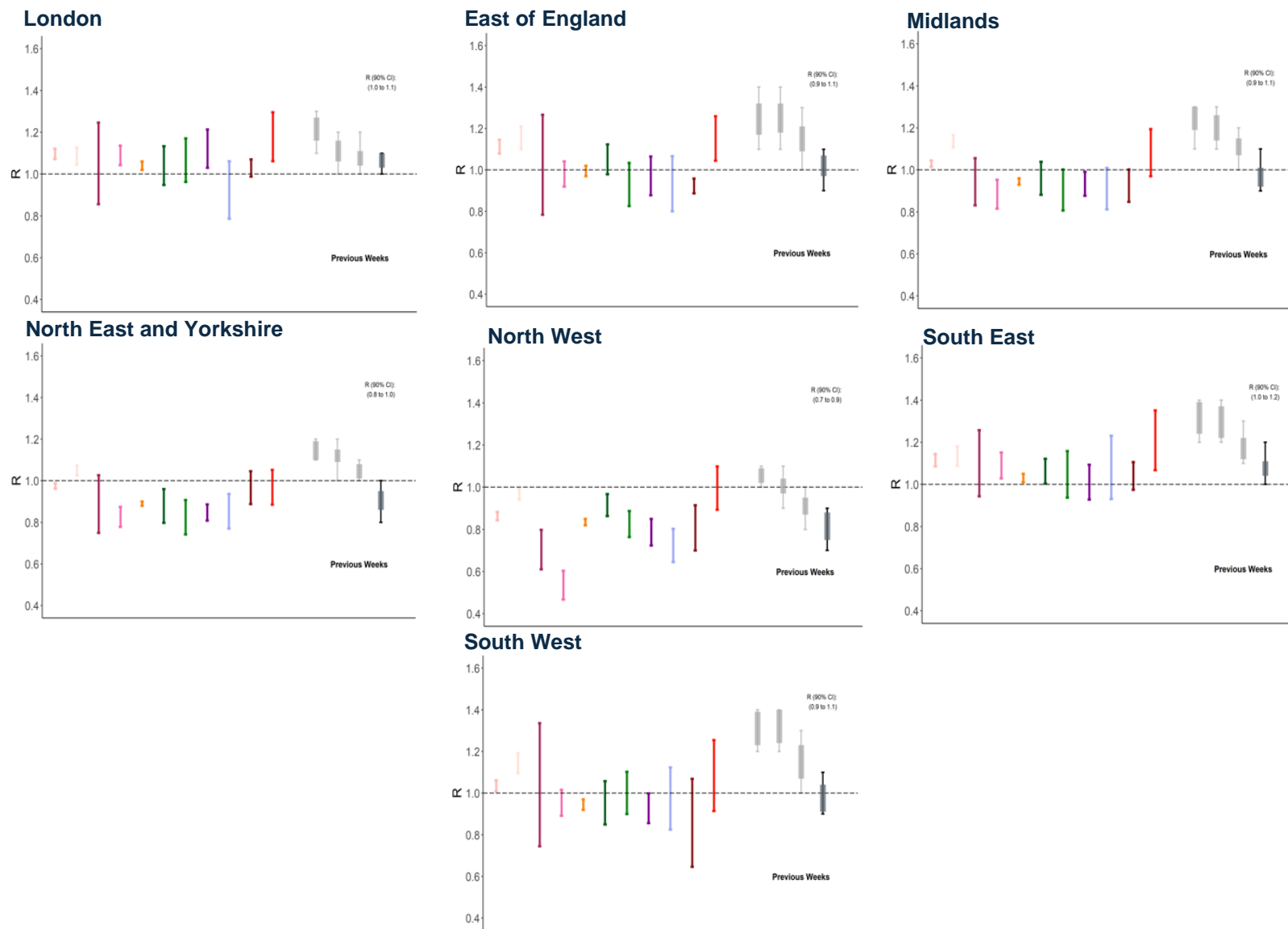
**Figure 2:** SPI-M-O groups estimates of median R in the four nations of the UK, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.



**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.



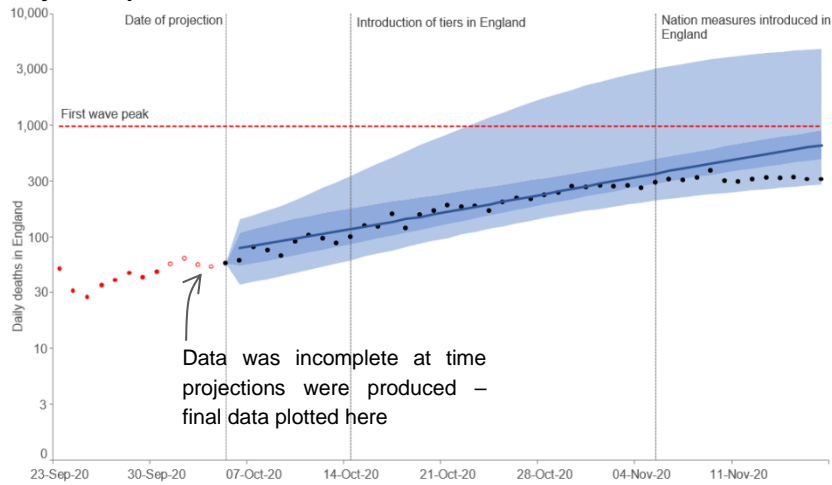
**Figure 4:** SPI-M-O groups estimates of median R in the NHS England regions, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.



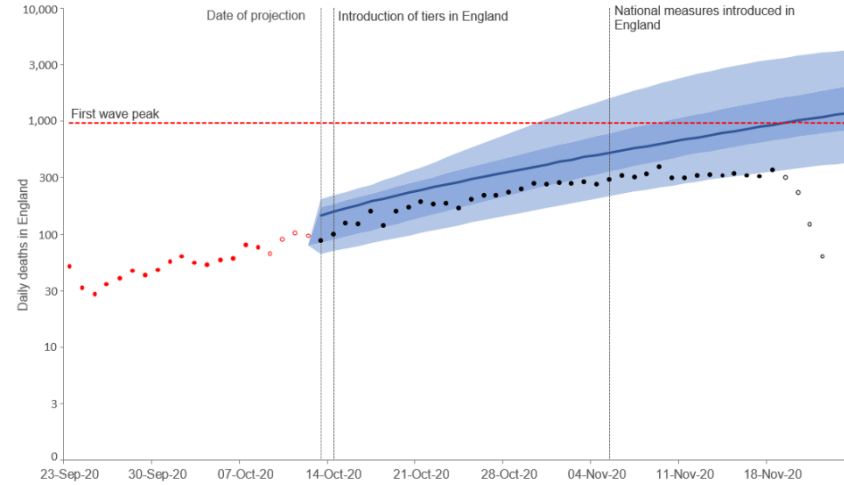


**Figure 5:** Medium-term projections for daily deaths by date of death in England on a *log scale*. Deaths here represent people who tested positive and died within 28 days of their first positive test. The blue line represents the consensus projection based on trends at the time of projection. The dark blue band shows the interquartile range and the light blue band, the 90% credible interval; this method of aggregation leads to conservative (wide) credible intervals. Red dots indicate data from before the projections were produced and open circles are data that was incomplete at that time. Black dots indicate daily deaths recorded since the projections were produced and open circles represent data that will be revised upwards as more deaths are reported.

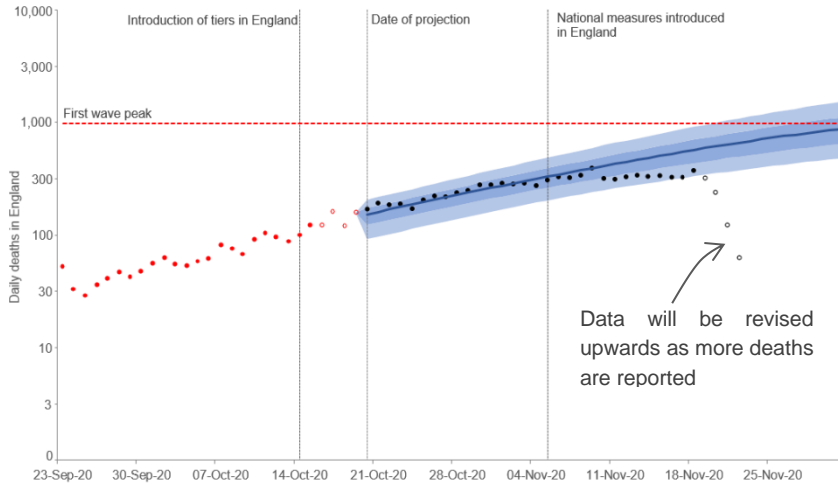
**Projection produced 6<sup>th</sup> October**



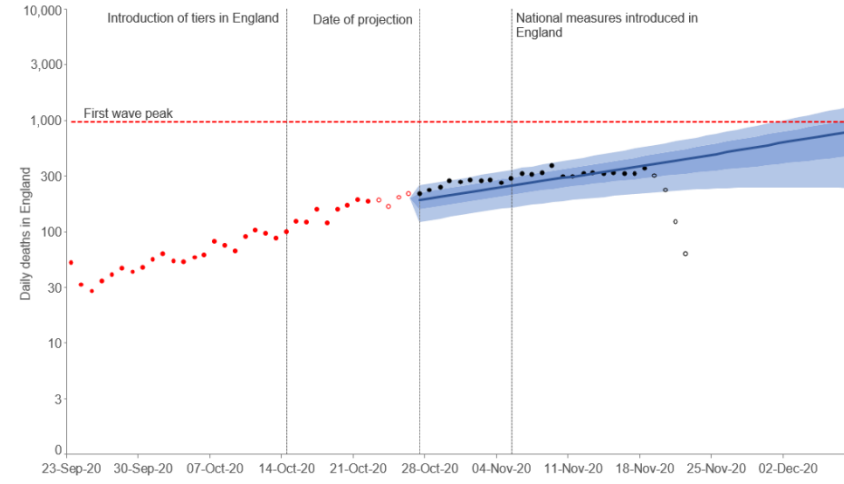
**Projection produced 13<sup>th</sup> October**



**Projection produced 20<sup>th</sup> October**

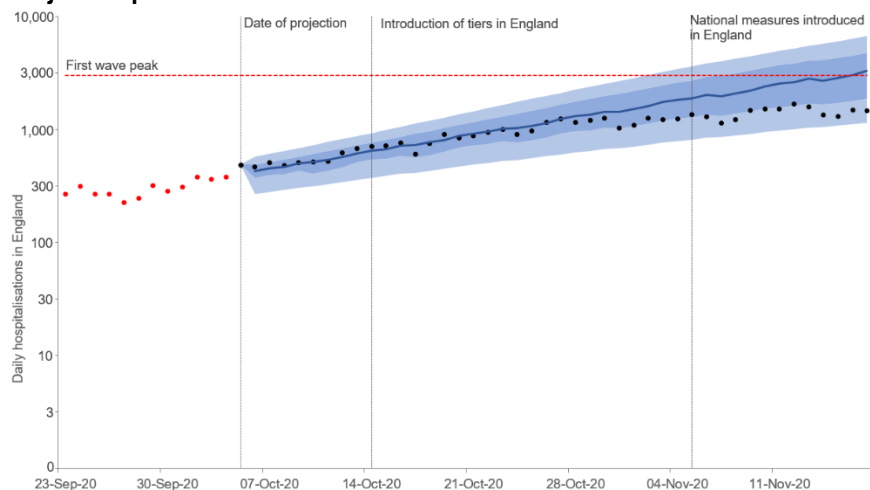


**Projection produced 27<sup>th</sup> October**

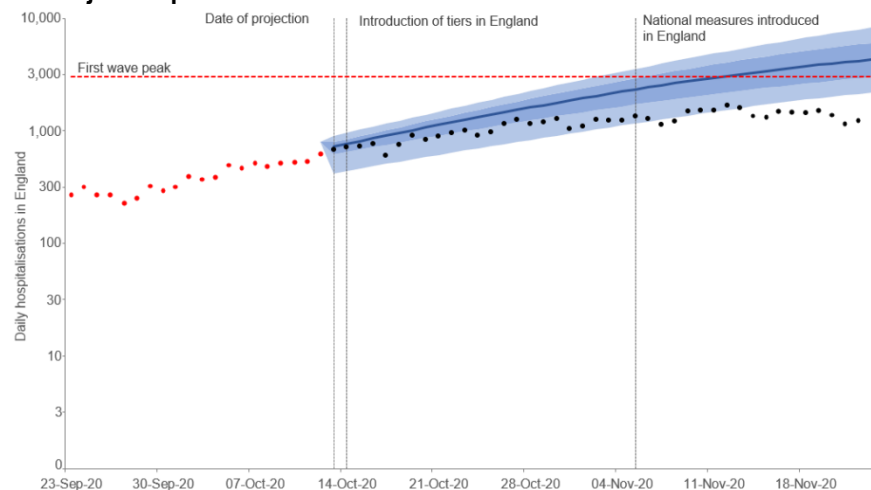


**Figure 6:** Medium-term projections for daily hospitalisations in England on a *log scale*. Hospitalisations are taken from the NHS England COVID-19 situation reports and are defined as patients admitted with confirmed COVID-19 and those who test positive after admission. The blue line shows the consensus projection based on trends at the time of projection. The dark blue band shows the interquartile range and the light blue band, the 90% credible interval; this method of aggregation leads to conservative (wide) credible intervals. Red dots indicate the data from before the projections were produced and the black dots indicate the number of hospitalisations recorded since their production.

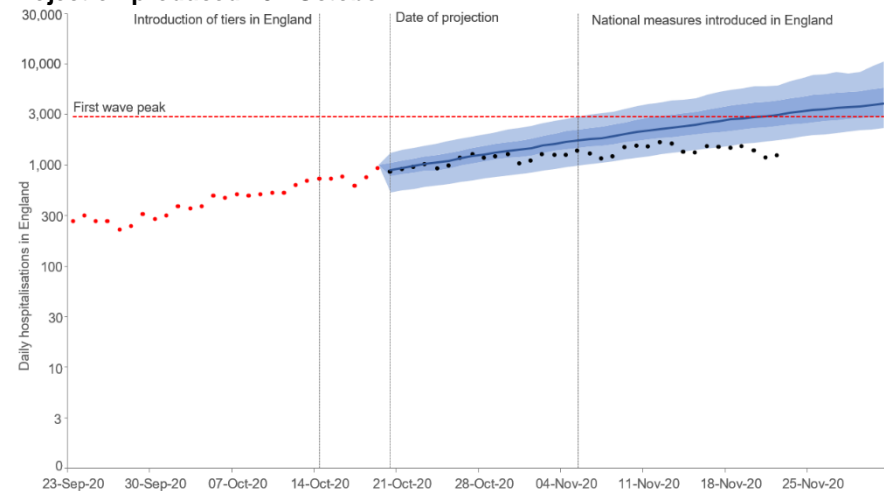
**Projection produced 6<sup>th</sup> October**



**Projection produced 13<sup>th</sup> October**



**Projection produced 20<sup>th</sup> October**



**Projection produced 27<sup>th</sup> October**

