

Coronavirus (COVID-19): Analysis

Coronavirus (COVID-19): modelling the epidemic in Scotland (Issue No. 89)

Background

This is a report on the Scottish Government modelling of the spread and level of Covid-19 in Scotland. This updates the previous publication on modelling of Covid-19 in Scotland published on 3rd February 2022. The estimates in this document help the Scottish Government, the health service and the wider public sector plan and put into place what is needed to keep us safe and treat people who have the virus.

This edition of the research findings focuses on the epidemic as a whole, looking at estimates of R, growth rate and incidence as well as local measures of change in the epidemic.

Key Points

- The reproduction rate R in Scotland is currently estimated as being between 0.8 and 1.0, as of 25th January 2022. The lower and upper limits have increased since last week.
- The daily growth rate for Scotland is currently estimated as between -5 and -1% as at 25th January. The lower limit has increased since last week.
- The number of new daily infections for Scotland is estimated as being between 168 and 292 as at 25th January, per 100,000 people.
- Average contacts from the most recent Panel B cohort of the Scottish Contact Survey (week ending 2nd February) indicate an average of 5.1 contacts. Last week's average contacts of 4.7 contacts was based on Panel A, for the week ending 26th January.
- Mean contacts have increased within the work setting by 43%. Contacts within the home and other setting (contacts outside home, school and work) have remained at a similar level over the same period.
- The youngest (18-29) and oldest age groups (60+) have reported an increase in contacts in the last two weeks. Increases were largely

driven by contacts within the work setting for those in the youngest age group, with individuals 60 and over reporting a rise in contacts within the other setting. All remaining age groups reported a decrease in contacts.

- The biggest increase in interactions between age groups is between those aged 18-29 with individuals under 18.
- Visits to a pub or restaurant have shown the biggest increase, increasing from approximately 32% to 40% while visits to a health facility have shown the biggest decrease, decreasing from 21% to 19% in the last two weeks.
- The number of people wearing a face covering where they have at least one contact outside of the home has increased in the last two weeks from 81% to 83%.
- Approximately 74% of individuals had taken at least one lateral flow test within the last 7 days for the survey pertaining to the 27th January - 2nd February, decreasing from 76% two weeks prior. Of those individuals who had taken a lateral flow within the last 7 days, 33% did not report their results.
- The future trajectory of infections, hospitalisations, hospital occupancy and deaths is highly uncertain; some Delta infections may also continue. We estimate that daily infections may be between 2,000 and 37,000 in early March. This includes the impact of the interventions announced on 14th and 21st December; those announced as being lifted from 17th, 24th and 31st January; and booster take up.
- Modelled rates of positive tests per 100K using data to 7th February indicate that, for the week commencing 20th February 2022, 28 local authorities are expected to exceed 100 cases per 100K, with at least 75% probability. The exceptions are South Ayrshire, Na h-Eileanan Siar, Orkney Islands and Shetland Islands.
- Four local authorities are expected to exceed 300 cases per 100K, with at least 75% probability. These are Aberdeen, Edinburgh, Dundee and Midlothian. Only one local authority, Dundee, is expected to exceed 500 cases per 100K, with at least 75% probability.
- Analysis by the Edinburgh University Roslin Institute indicates that there remains a substantial variation in risk of infection by age. Deprivation in the period analysed is not a substantial factor. Whereas the distribution of lateral flow/LFD tests being reported varies substantially by both age and deprivation status, with many fewer tests reported in younger adults across all deciles of deprivation, and for children in more deprived deciles. The high level

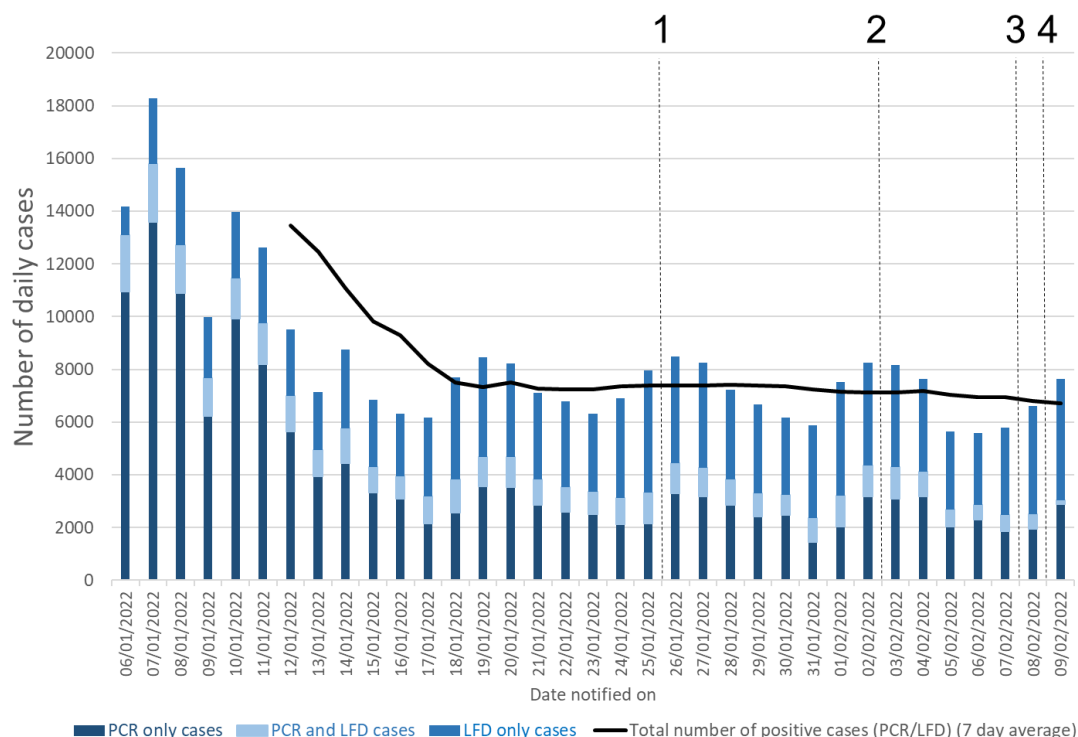
of LFD positivity in the latter category is marked, and when compared to the high number of positives amongst the least deprived, suggests this may reflect under ascertainment.

- The R value remains low for both S-gene positive and negative cases, though there has been a marked increase in R for S-gene positives in the past week, possibly reflecting increased spread of the BA.2 variant. This estimate of R for the last few days of the analysis should be viewed with caution, due to the effect of uncertain impact of partially observed infections caused for the most recent cases.
- Nationwide, wastewater (WW) Covid-19 levels remained at their previous levels, with the week ending on 7th February recording levels of 52 million gene copies per person per day (Mgc/p/d), essentially the same as 53 Mgc/p/d the previous week (ending 31st January). There is some slight variability between locations, but it is not yet clear if this forms any systematic pattern.
- Modelling of long Covid estimates that on 27th February 2022 between 1.1% and 2.9% of the population are projected to self-classify with long Covid for 12 weeks or more after their first confirmed (or suspected) Covid infection in Scotland. The limits of the projection of the proportion of the population with long Covid are lower than last week.

Recent cases

Figure 1 shows the number of Covid-19 cases (from either PCR or LFD¹) in Scotland over January 2022. The vertical dashed lines indicate the cut off points for each of the modelling inputs; after these dates, the number of cases is not incorporated into the outputs.

Figure 1: PCR and LFD positive daily and weekly case numbers by reporting date²



R, growth rate and incidence are as of 25th January 2022 (dashed line 1). The Scottish Contact Survey uses data to 2nd February 2022 (dashed line 2). The Scottish Government modelling of infections, the long Covid analysis and the modelled rates of positive tests per 100K use data to 7th February (dashed line 3). The wastewater analysis uses data to 8th February 2022 (dashed line 4).

Overview of Scottish Government Modelling

Modelling outputs are provided here on the current epidemic in Scotland as a whole, based on a range of methods. Because it takes a little over three weeks on average for a person who catches Covid-19 to show

¹ These figures are produced by Public Health Scotland as “experimental statistics” and may be subject to future revision as the new method for counting combined PCR and LFD tests evolves.

² <https://www.gov.scot/publications/coronavirus-covid-19-daily-data-for-scotland/>

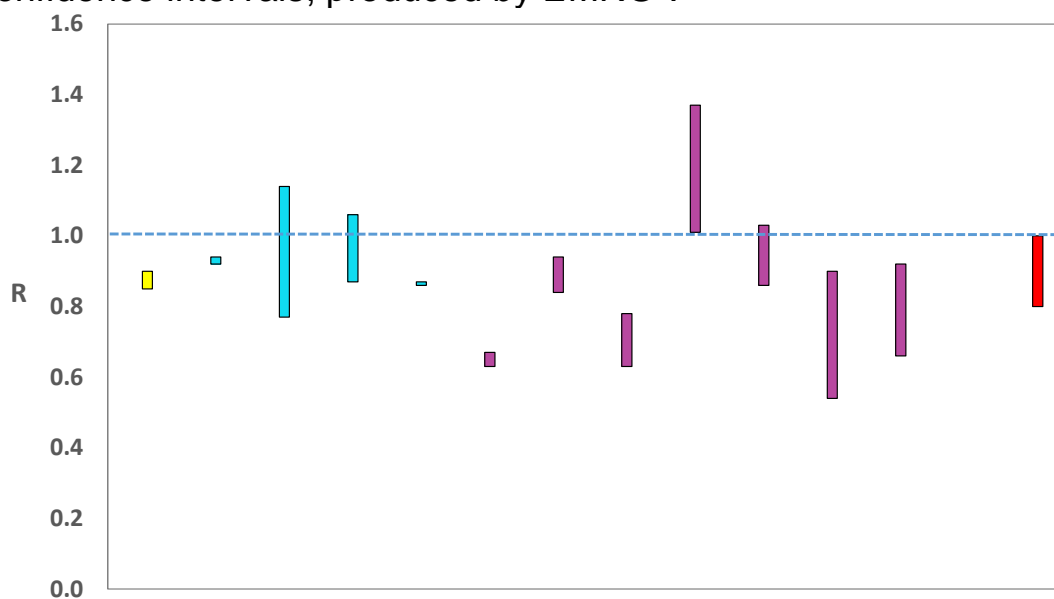
symptoms, become sick, and either die or recover, there is a time lag in what our model can tell us about any change in the epidemic.

This week the Scottish Government presented one output to EMRG. This used modelled infection figures provided by the Covid Infection Survey. This output is included in Figures 2 and 3.

The R value and growth rates are estimated by several independent modelling groups based in universities and the UKHSA. Estimates are considered, discussed and combined at the Epidemiology Modelling Review Group (EMRG), which sits within the UKHSA. These are based on data to 7th February.

UKHSA's consensus view across these methods was that the value of R in Scotland³ is between 0.8 and 1.0, as of 25th January 2022⁴ (Figure 2). R is an indicator that lags by two to three weeks.

Figure 2. Estimates of R_t for Scotland, as of 25th January, including 90% confidence intervals, produced by EMRG⁵.



Source: EMRG

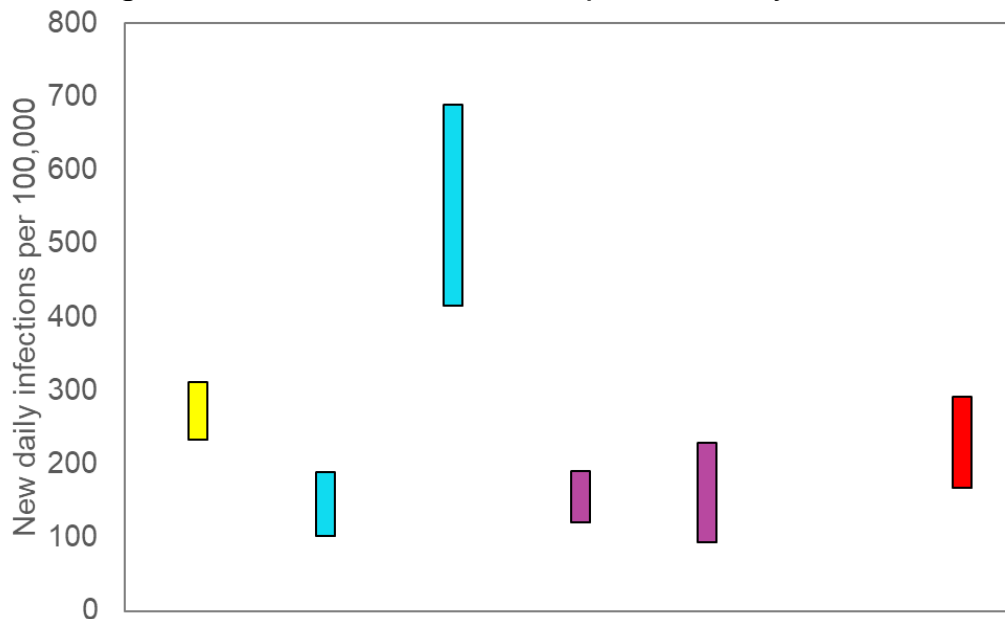
³ Using data to 7th February.

⁴ Particular care should be taken when interpreting this estimate as it is based on low numbers of cases, hospitalisations, or deaths and / or dominated by clustered outbreaks. It should not be treated as robust enough to inform policy decisions alone.

⁵ The cyan bars use Covid-19 test data and purple bars use multiple sources of data. The estimate produced by the Scottish Government is on the left (yellow). The UKHSA consensus range is the right-most (red). Data to 7th February 2022. R, incidence and growth rate as of 25th January.

The various groups which report to the EMRG use different sources of data in their models to produce estimates of incidence (Figure 3). UKHSA’s consensus view across these methods, as at 25th January, was that the incidence of new daily infections in Scotland was between 168 and 292 new infections per 100,000. This equates to between 9,200 and 16,000 people becoming infected each day in Scotland.

Figure 3. Estimates of incidence for Scotland, as at 25th January, including 90% confidence intervals, produced by EMRG.



Source: EMRG

The consensus from UKHSA for this week is that the growth rate in Scotland is between -5% and -1% per day as at 25th January. The upper limit has increased since last week.

What we know about how people’s contact patterns have changed

Average contacts from the most recent Panel B cohort of the Scottish Contact Survey (week ending 2nd February) indicate an average of 5.1 contacts. This has remained at a similar level compared to the previous Panel B of the survey (week ending 19th January), as seen in Figure 4. Mean contacts have increased within the work setting by 43%. Contacts within the home and other setting (contacts outside home, school and work) have remained at a similar level over the same period.

Figure 4: Mean Adult Contacts (truncated at 100) from SCS.

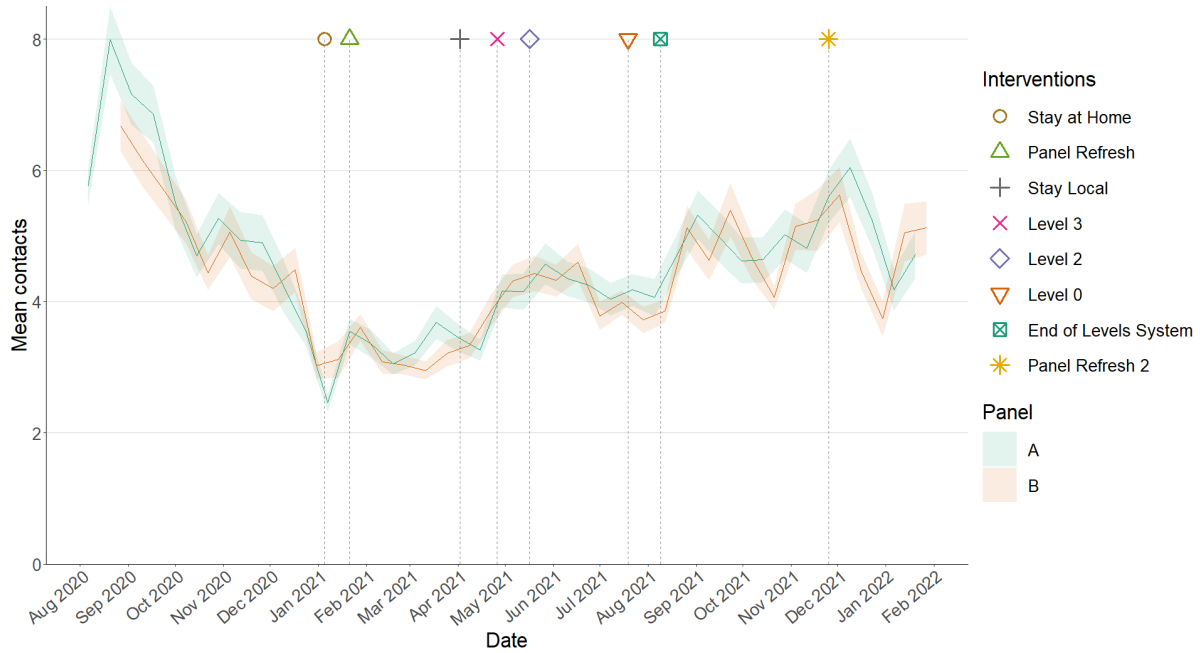


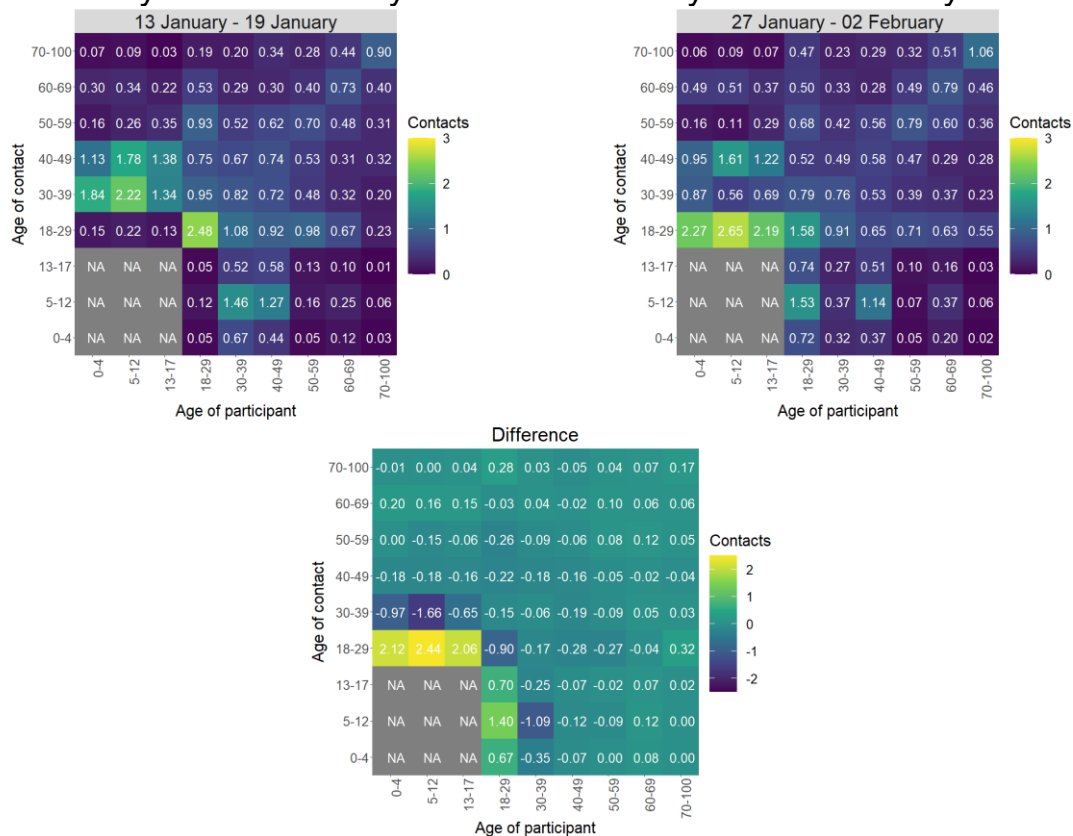
Figure 5 shows how contacts change across age group and setting. The youngest (18-29) and oldest age groups (60+) have reported an increase in contacts in the last two weeks. Increases were largely driven by contacts within the work setting for those in the youngest age group, with individuals 60 and over reporting a rise in contacts within the other setting. All remaining age groups reported a decrease in contacts.

Figure 5: Average (mean) contacts for each panel per day by setting for adults in Scotland, truncated to 100 contacts per participant (from SCS).



The heatmaps in Figure 6 show the mean overall contacts between age groups for the weeks relating to 13th January - 19th January and 27th January - 2nd February and the difference between these periods. The biggest increase in interactions between age groups is between those aged 18-29 with individuals under 18.

Figure 6: Overall mean contacts by age group for the weeks relating to 13th January - 19th January and 27th January - 2nd February.



The biggest changes in the proportion of participants visiting different locations is seen in those visiting a pub or restaurant and individuals visiting a healthcare facility. Visits to a pub or restaurant have shown the biggest increase, increasing from approximately 32% to 40% while visits to a health facility have shown the biggest decrease, decreasing from 21% to 19% in the last two weeks as shown in Figure 7.

Figure 7: Locations visited by participants at least once for panel A and B (from SCS).

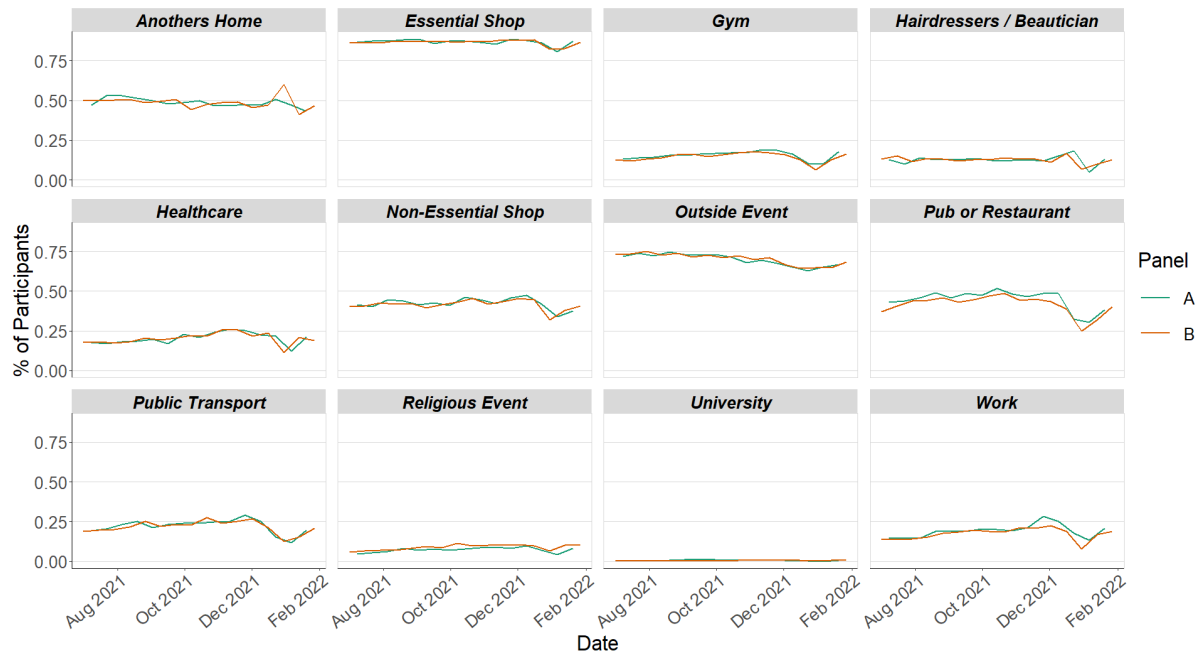
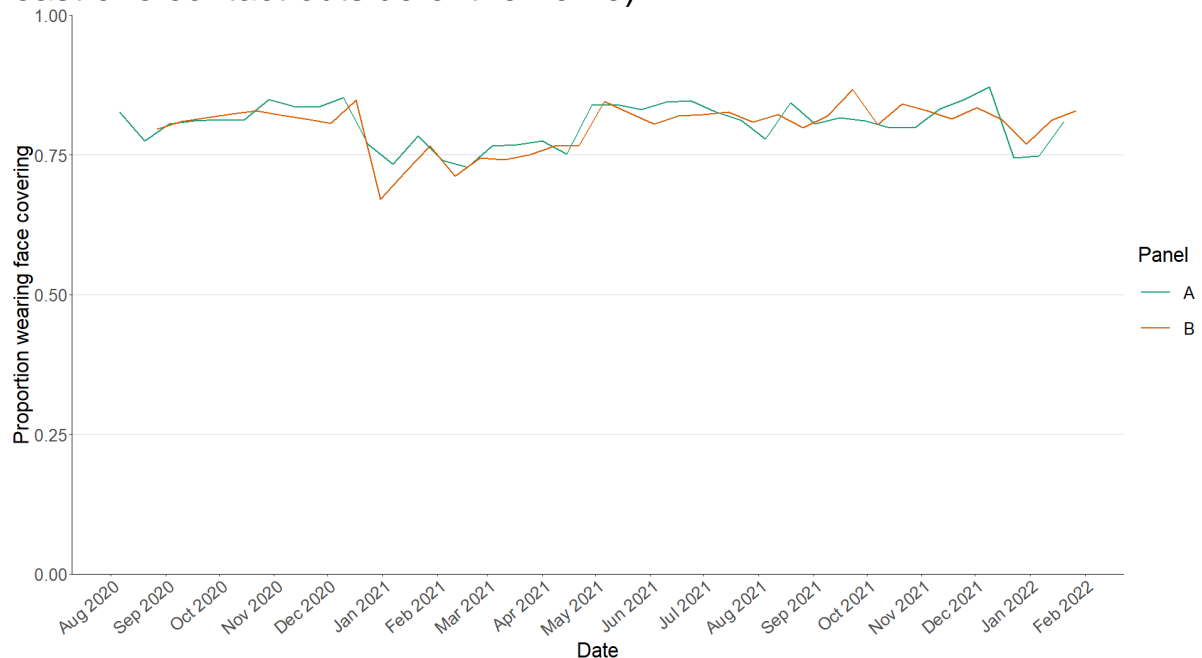


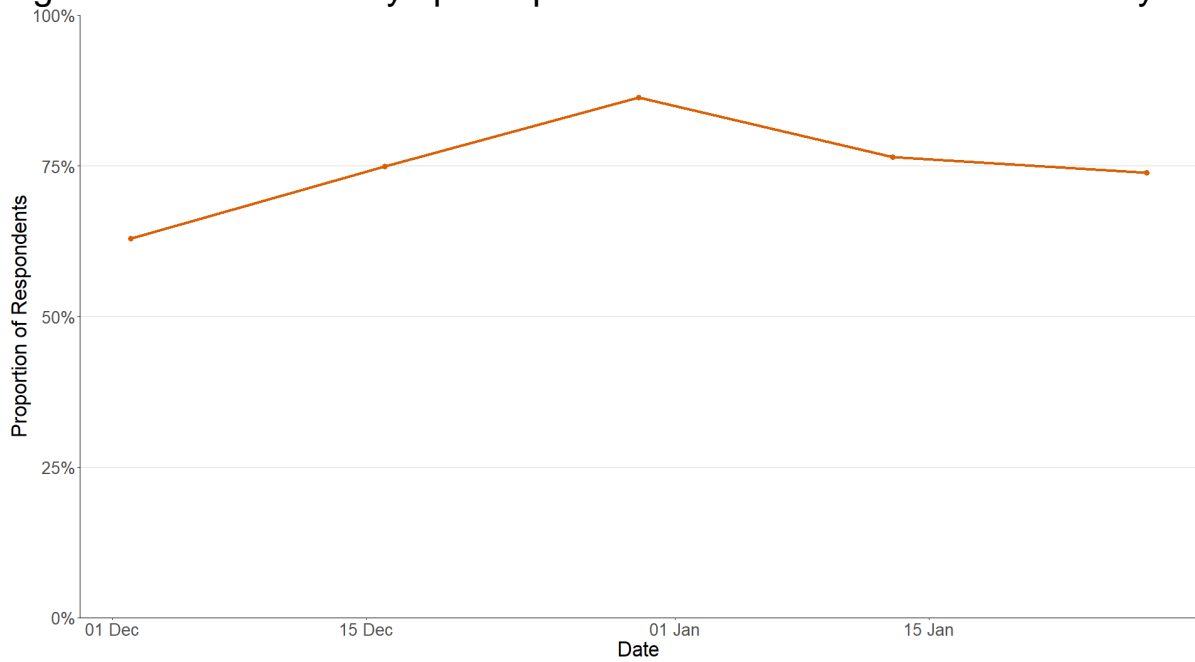
Figure 8 shows the number of people wearing a face covering where they have at least one contact outside of the home. This has increased in the last two weeks from 81% to 83%.

Figure 8: Proportion of adults wearing a face covering over time (with at least one contact outside of the home).



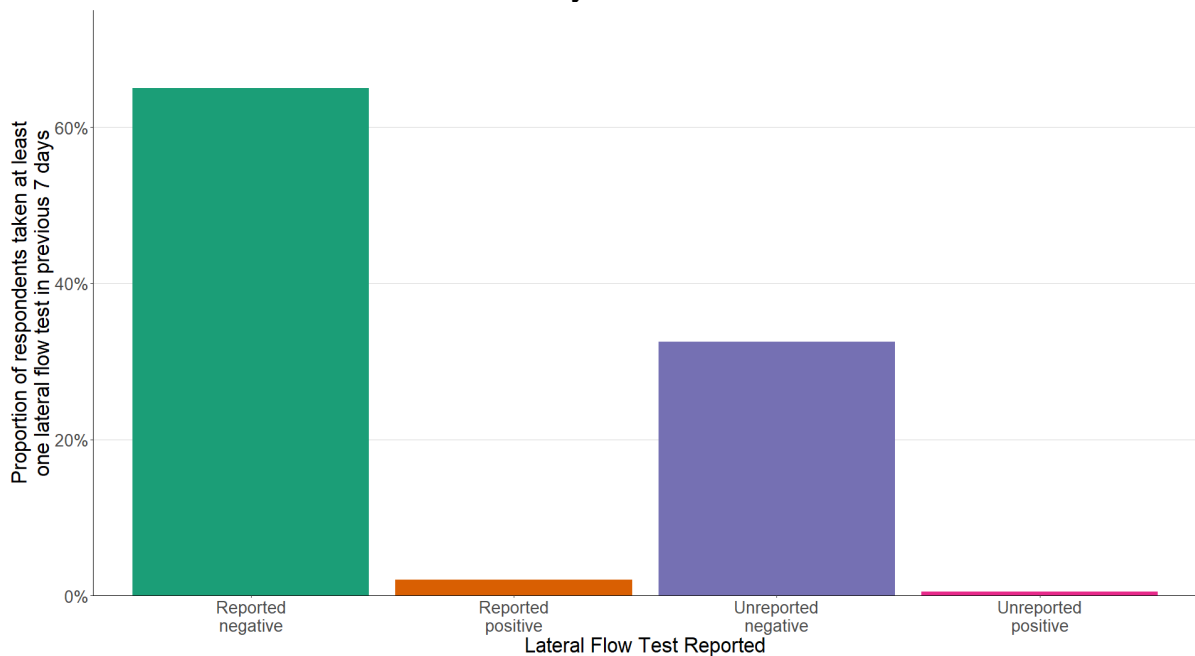
Approximately 74% of individuals had taken at least one lateral flow test within the last 7 days for the survey pertaining to the 27th January - 2nd February, decreasing from 76% two weeks prior as shown in Figure 9.

Figure 9: Number of days participants taken a lateral flow in last 7 days.



Of those individuals who had taken a lateral flow within the last 7 days, 33% did not report their results as shown in Figure 10.

Figure 10: Reporting rates of respondents, who have taken at least one lateral flow test within the last 7 days



What the modelling tells us about estimated infections

The Scottish Government assesses the impact of Covid-19 on the NHS in the next few weeks. Figures 11 - 13 show projections over four weeks for combined Delta and Omicron infections.

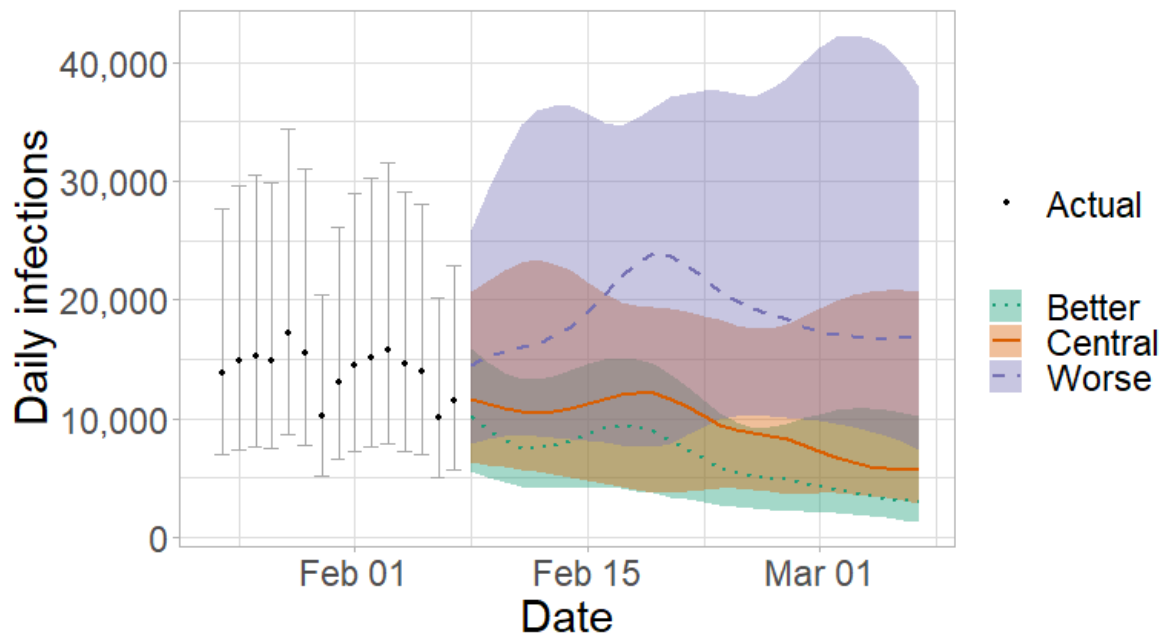
These projections include the effect of the interventions announced on 14th and 21st December 2021; those announced as being lifted from 17th, 24th and 31st January 2022; and booster take up. 'Central' assumes that infections broadly plateau at current levels. 'Worse' assumes a higher transmissibility for Covid-19 whereas 'Better' assumes a lower transmissibility. All projections also assume a lower vaccine effectiveness for Omicron than for Delta⁶.

The future trajectory of infections is uncertain.

Following the announcement removing the need for a confirmatory PCR test in some cases we have used combined PCR and LFD reported date data from 6th January.

⁶ All projections are based on current vaccine roll-out plans and efficacy assumptions. Data to 7th February 2022.

Figure 11. Medium term projections of modelled total new combined daily infections in Scotland, adjusting positive tests⁷ to account for asymptomatic and undetected infections, from Scottish Government modelling, based on positive test data reported up to 7th February 2022.



We estimate that daily infections may be between 2,000 and 37,000 in early March.

Figure 12 shows the impact of the projections on the number of people in hospital. The modelling includes all hospital stays, whereas the actuals only include stays up to 28 days duration that are linked to Covid-19.

There continues to be uncertainty over hospital occupancy and intensive care in the next four weeks.

⁷ The actual positive tests are adjusted to coincide with the estimated day of infection.

Figure 12. Medium term projections of modelled hospital bed demand, from Scottish Government modelling, based on positive test data reported up to 7th February.

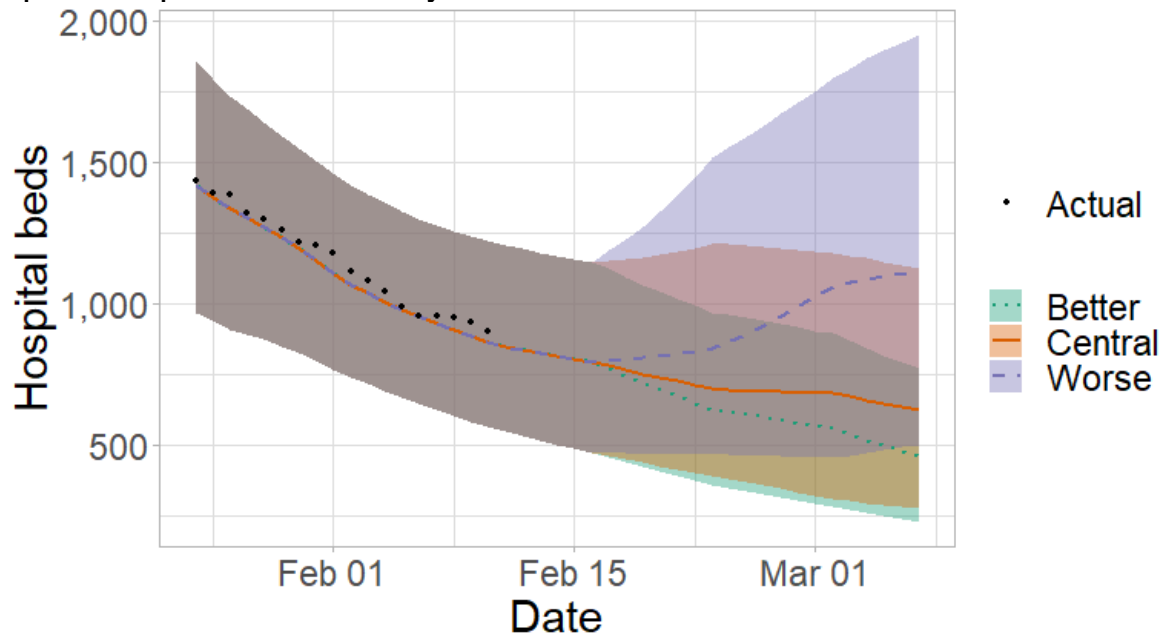
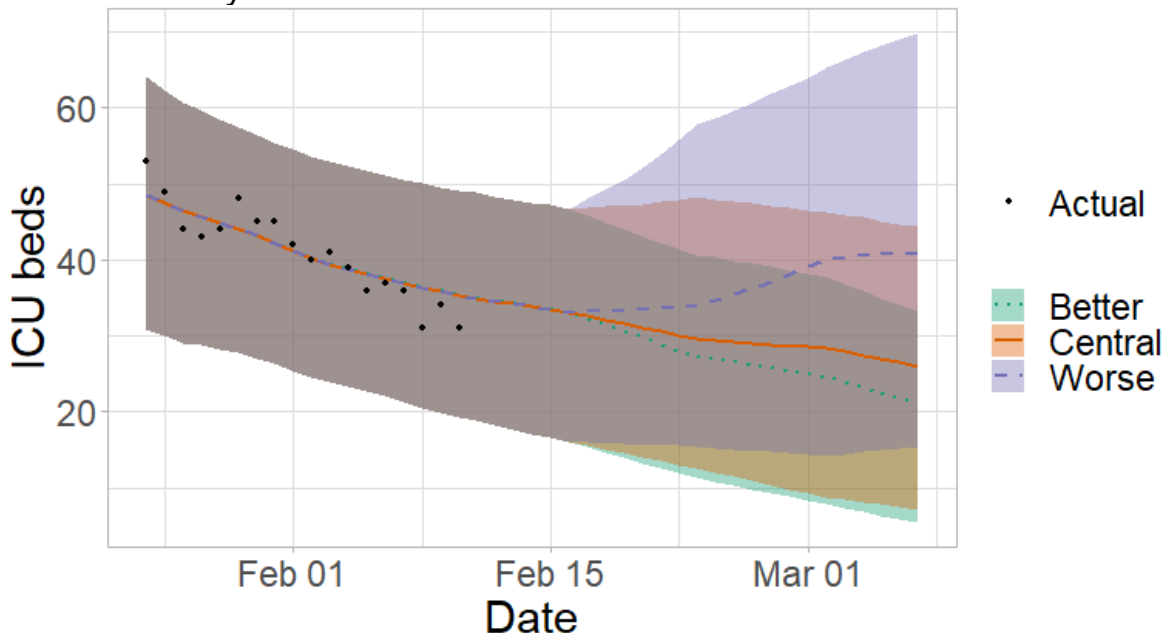


Figure 13 shows the impact of the projection on ICU bed demand.

Figure 13. Medium term projections of modelled ICU bed demand, from Scottish Government modelling⁸, based on positive test data reported up to 7th February.



⁸ Actual data does not include full numbers of CPAP. ICU bed actuals include all ICU patients being treated for Covid-19 including those over 28 days.

What the modelling tells us about projections of hospitalisations, occupancy and deaths in the medium term

SPI-M-O produces projections of the epidemic (Figures 14 - 16), combining estimates from several independent models. These projections are not forecasts or predictions. They represent a scenario in which the trajectory of the epidemic continues to follow the trends that were seen in the data available to 7th February and do not include the effects of any future policy or behavioural changes.

The delay between infection, developing symptoms, the need for hospital care, and death means they cannot fully reflect the impact of behaviour changes in the two to three weeks prior to 7th February.

The projections include the potential impact of vaccinations over the next few weeks. Modelling groups have used their expert judgement and evidence from UKHSA, Scottish Universities & Public Health Scotland, and other published efficacy studies when making assumptions about vaccine effectiveness.

Figure 14. SPI-M-O medium-term projection of daily hospitalisations in Scotland, at 50% and 90% credible intervals.

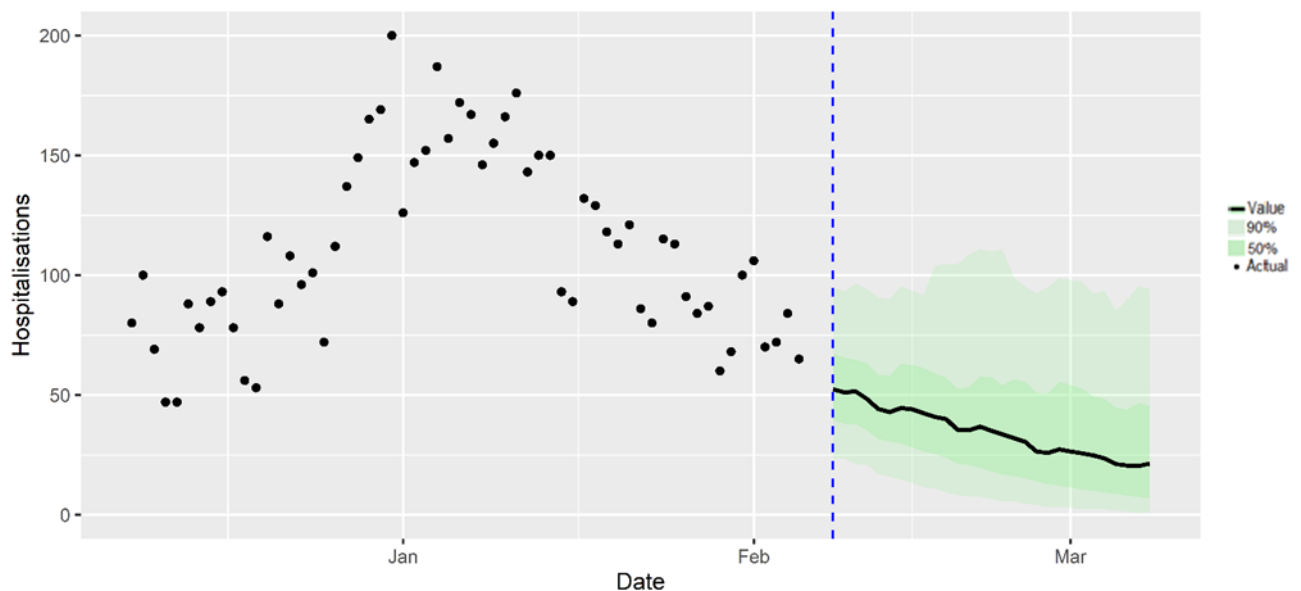


Figure 15 shows the SPI-M-O consensus on hospital occupancy. Hospital occupancy is determined by the combination of admissions and length of stay (LoS), the latter of which is difficult to model with confidence.

Figure 15. SPI-M-O medium-term projection of hospital occupancy in Scotland, at 50% and 90% credible intervals

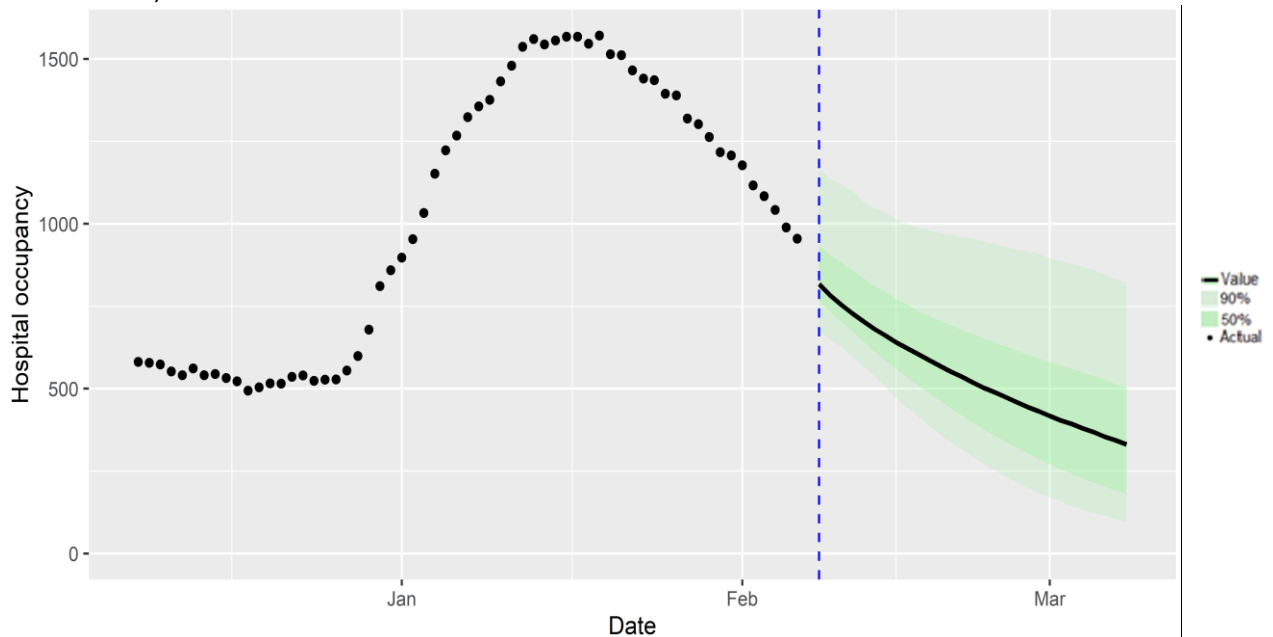
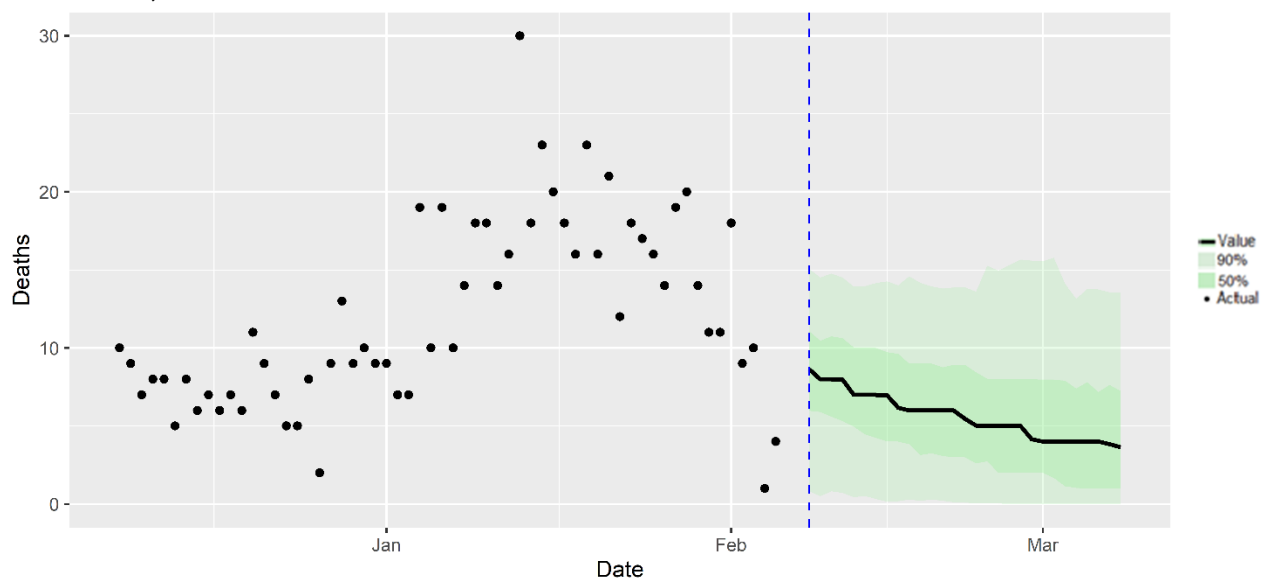


Figure 16 shows the SPI-M-O consensus on daily Covid-19 deaths.

Figure 16. SPI-M-O medium-term projection of daily Covid-19 deaths in Scotland, at 50% and 90% credible intervals.



What we know about which local authorities are likely to experience high levels of Covid-19 in two weeks' time

We continue to use modelling based on Covid-19 cases and deaths using data to 7th February 2022 from several academic groups to give us an indication of whether a local authority is likely to experience elevated levels of Covid-19 in the future. This has not been compiled via

UKHSA into a consensus this week and is based on one modelling group due to issues with some of the models converging. In this an area is defined as a hotspot if the two-week prediction of cases (positive tests) per 100K population is predicted to exceed a threshold, e.g., 500 cases.

Some of the models contributing to this analysis are informed by both PCR and LFD positive tests whilst others are currently informed by PCR only.

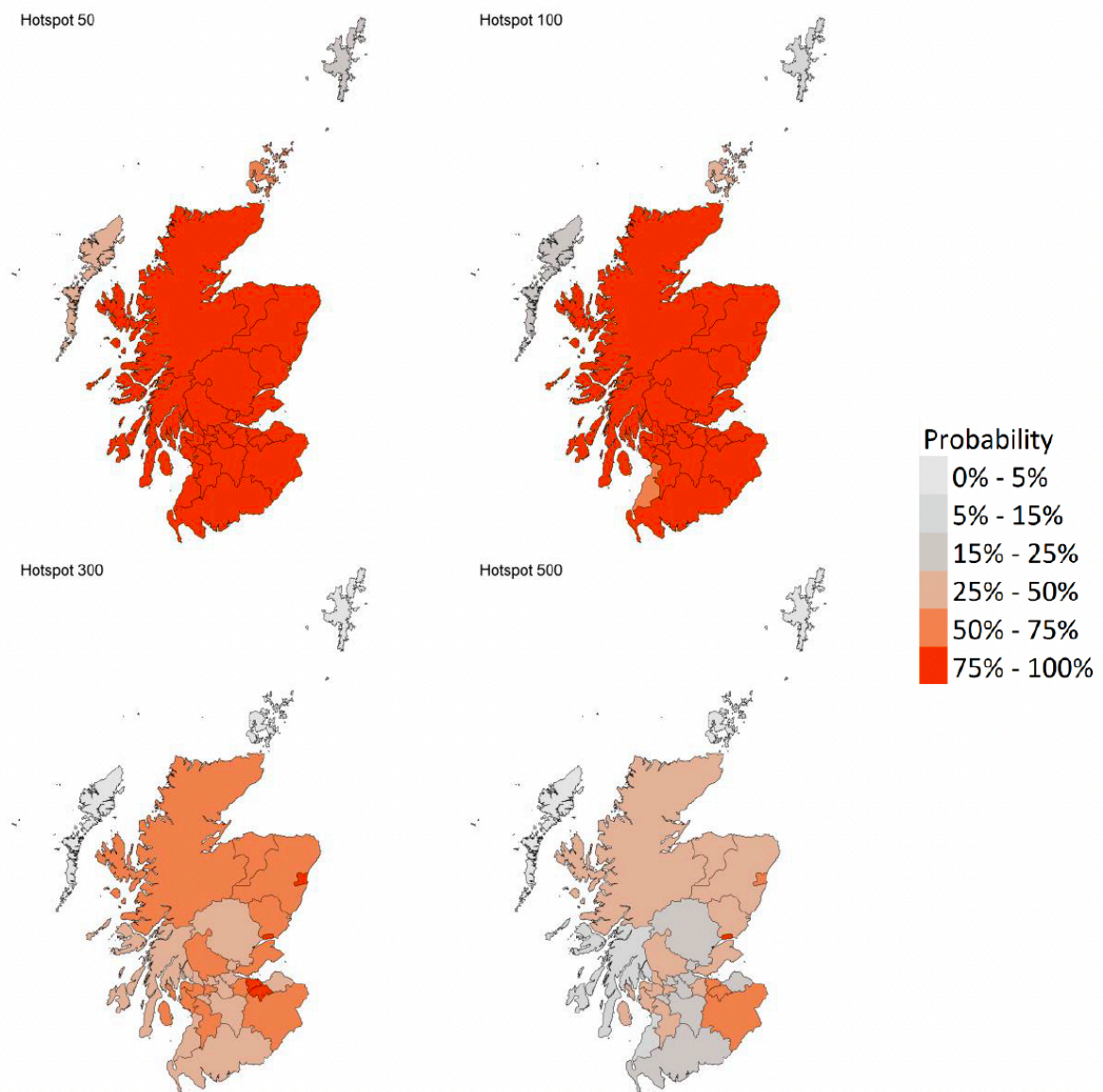
Modelled rates of positive tests per 100K using data to 7th February (Figure 17) indicate that, for the week commencing 20th February 2022, 29 of the 32 local authorities are expected to exceed 50 cases per 100K with at least 75% probability. The exceptions are Na h-Eileanan Siar, Orkney Islands and Shetland Islands.

28 local authorities are expected to exceed 100 cases per 100K, with at least 75% probability. The exceptions are South Ayrshire, Na h-Eileanan Siar, Orkney Islands and Shetland Islands.

Four local authorities are expected to exceed 300 cases per 100K, with at least 75% probability. These are Aberdeen, Edinburgh, Dundee and Midlothian.

Only one local authority, Dundee, is expected to exceed 500 cases per 100K, with at least 75% probability.

Figure 17. Probability of local authority areas exceeding thresholds of cases per 100K (20th February to 26th February 2022), data to 7th February.



Summary of spatial analysis of COVID-19 spread in Scotland

Researchers at the Edinburgh Roslin Institute have conducted spatial analysis of COVID-19 spread in Scotland. A summary of findings from the week from 29th Jan to 5th Feb 2022 is included here.

In the period 29th January to 5th February, an S Gene Target Failure (SGTF) PCR result is assumed to be due to Omicron variant BA.1. In Scotland a test which is S-gene positive is taken to be a signature of Omicron variant BA.2, while acknowledging there may be some residual Delta variant cases contributing. To obtain estimates of the total spread

of the two variants, the variant type is assigned in proportion to the observed SGTF results per day at the Local Authority level. Figure 18 shows the outcome of modelling⁹ of risk factors by data zone, comparing a model including the average age of census recorded residents to one with no age information. Vaccine uptake is as recorded on 15th November 2021, i.e. just before Omicron was observed in Scotland. Data¹⁰ was taken on 7th February, covering the period 29th January to 5th February.

The modelling shows that there remains a substantial variation in risk of infection by age. Deprivation in this period is not a substantial factor. Whereas the distribution of lateral flow/LFD tests being reported varies substantially by both age and deprivation status, with many fewer tests reported in younger adults across all deciles of deprivation¹¹, and for children in more deprived deciles. The high level of LFD positivity in the latter category is marked, and when compared to the high number of positives amongst the least deprived, suggests this may reflect under ascertainment.

The R value remains low for both S-gene positive and negative cases, though there has been a marked increase in R for S-gene positives in the past week, possibly reflecting increased spread of the BA.2 variant. This estimate of R for the last few days of the analysis should be viewed with caution, due to the effect of uncertain impact of partially observed infections caused for the most recent cases.

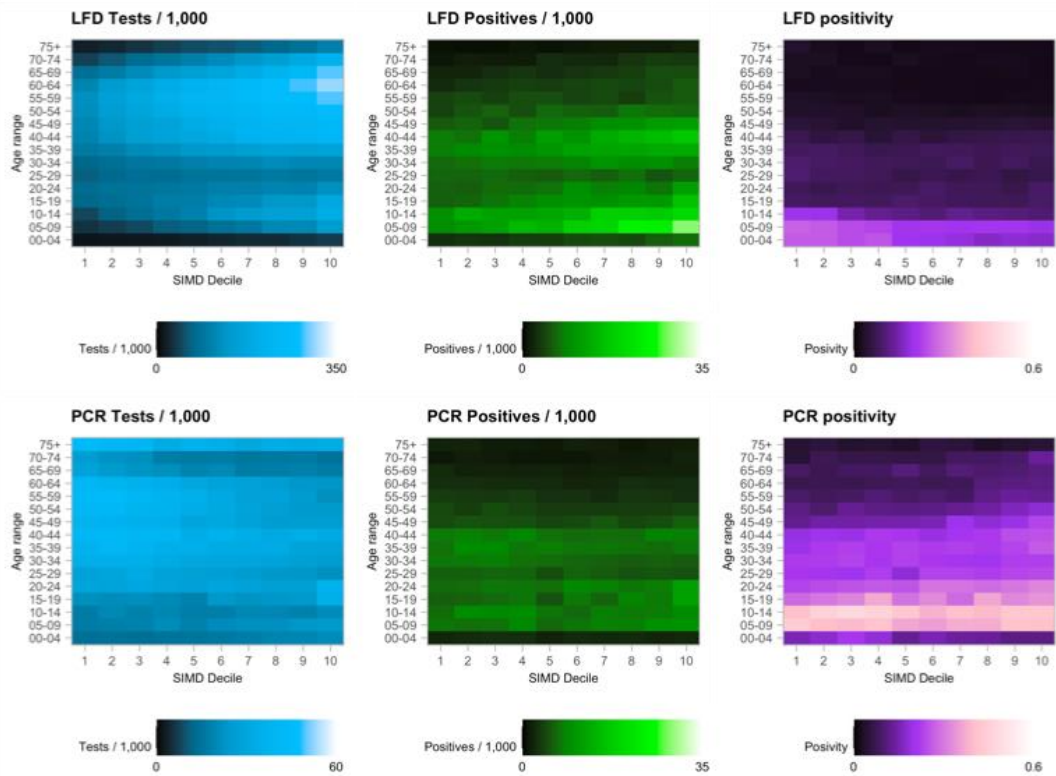
⁹ The technique uses a negative binomial model.

¹⁰ electronic Data Research and Innovation Service: [ISD Services | Electronic Data Research and Innovation Service \(eDRIS\) | ISD Scotland](#).

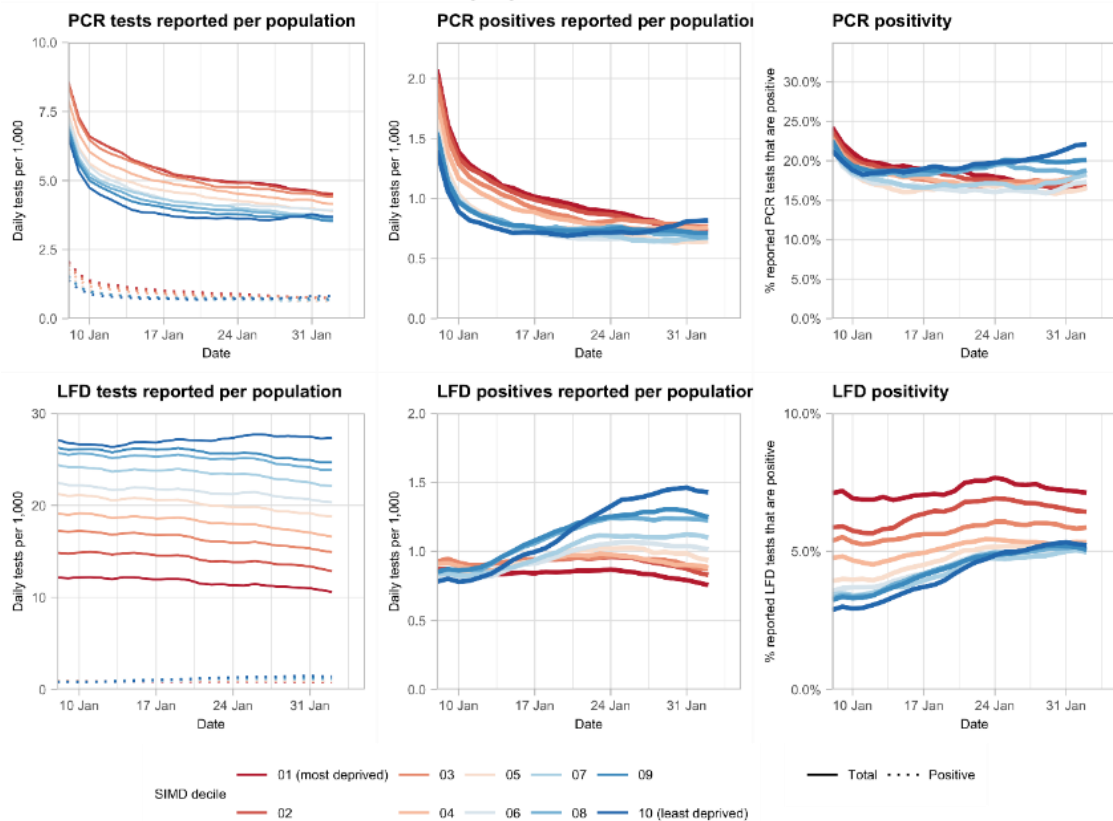
¹¹ For more detail on SIMD deciles refer to: [Scottish Index of Multiple Deprivation 2020 - gov.scot \(www.gov.scot\)](#).

Figure 18. Variation in testing outcomes comparing Lateral Flow and PCR testing (based on data to 5th February).

Testing and positivity - week ending 2022-02-05



Positivity by SIMD - 2022-02-05



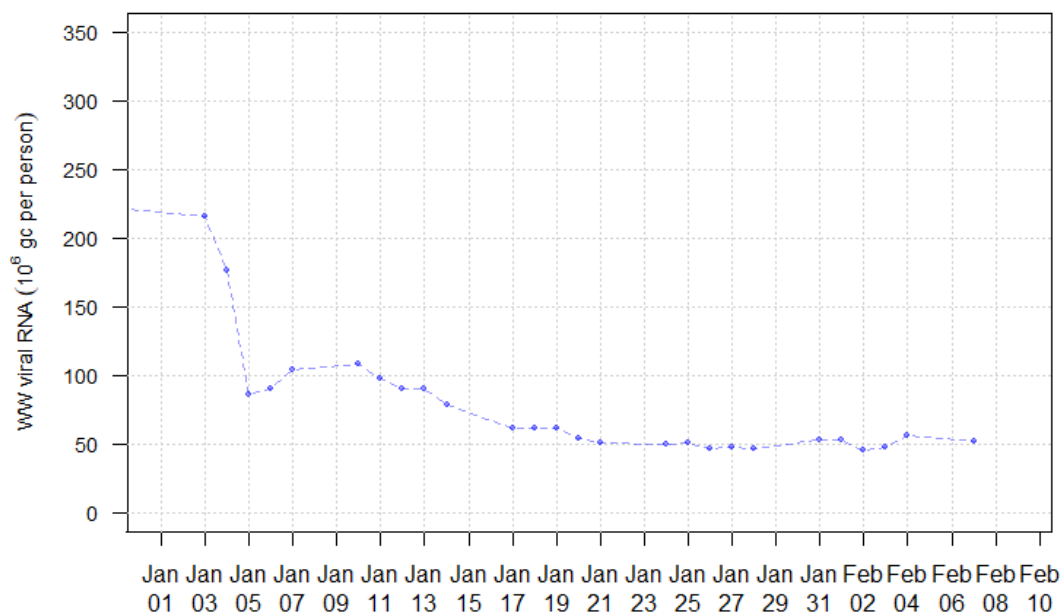
What can analysis of wastewater samples tell us about local outbreaks of Covid-19 infection?

Levels of Covid-19 in wastewater (WW) collected at a number of sites around Scotland are adjusted for population and local changes in intake flow rate (or ammonia levels where flow is not available). See Technical Annex in Issue 34 of these Research Findings for the methodology.

Nationwide, wastewater Covid-19 levels remained at their previous levels, with the week ending on 7th February recording levels of 52 million gene copies per person per day (Mgc/p/d), essentially the same as 53 Mgc/p/d the previous week. There is some slight variability between locations, but it is not yet clear if this forms any systematic pattern.

Compared to before December 2021, WW Covid-19 levels appear much lower than anticipated given the known levels of Covid-19 activity, as expressed by the ONS's Coronavirus Infection Survey. This effect may be due to the switchover from Delta variants to the new Omicron variant. Thus, Figure 19 shows only data from after the end of 2021, at which point the Omicron variant already represents almost all cases in Scotland. In this we see that national WW viral levels have been stable since late January.

Figure 19. National running average trends in wastewater Covid-19 from 31st December 2021 to 7th February 2022. For this graph, a wastewater Covid-19 average using the last 7 days of data is computed at every sampling date.



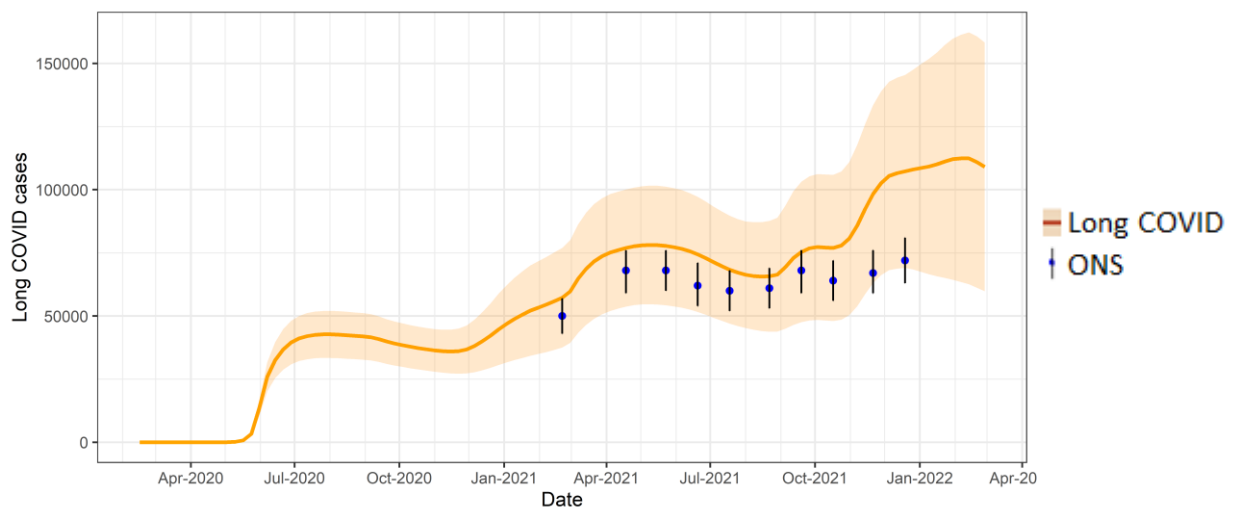
What estimates do we have of the number of people experiencing long Covid symptoms?

The Scottish Government is modelling the number of people likely to experience long Covid symptoms. This gives a projection of estimated self-reported long Covid rates in the future, based on Scottish Government medium term projection modelling, as set out in Figure 20.

This modelling estimates that at 27th February 2022 between 60,000 (1.1% of the population) and 158,000 (2.9%) people are projected to self-classify with long Covid for 12 weeks or more after their first suspected Covid infection in Scotland.

These are preliminary results, further data on rates of long Covid and associated syndromes as research emerges are required.

Figure 20. Estimates of self-classified long Covid prevalence at 12 weeks from 16th February 2020 to 27th February 2022 (showing 90% confidence interval). ONS estimates of self-reported long Covid with range also shown.



See the Technical Annex in issue 73 for information about the methodology.

What next?

Modelling will continue to look at the impact of Omicron, particularly the variant BA.2. The UKHSA Risk Assessment for BA.2 (26 Jan 2021) stated that there is moderate confidence that BA.2 has a growth advantage compared to BA.1, from data reported by multiple countries. As the year progresses we will incorporate different models as and when it is appropriate to do so.

Technical Annex

Epidemiology is the study of how diseases spread within populations. One way we do this is using our best understanding of the way the infection is passed on and how it affects people who catch it to create mathematical simulations. Because people who catch Covid-19 have a relatively long period in which they can pass it on to others before they begin to have symptoms, and the majority of people infected with the virus will experience mild symptoms, this “epidemiological modelling” provides insights into the epidemic that cannot easily be measured through testing e.g. of those with symptoms, as it estimates the total number of new daily infections and infectious people, including those who are asymptomatic or have mild symptoms.

Modelling also allows us to make short-term forecasts of what may happen with a degree of uncertainty. These can be used in health care and other planning. The modelling in this research findings is undertaken using different types of data which going forward aims to both model the progress of the epidemic in Scotland and provide early indications of where any changes are taking place.

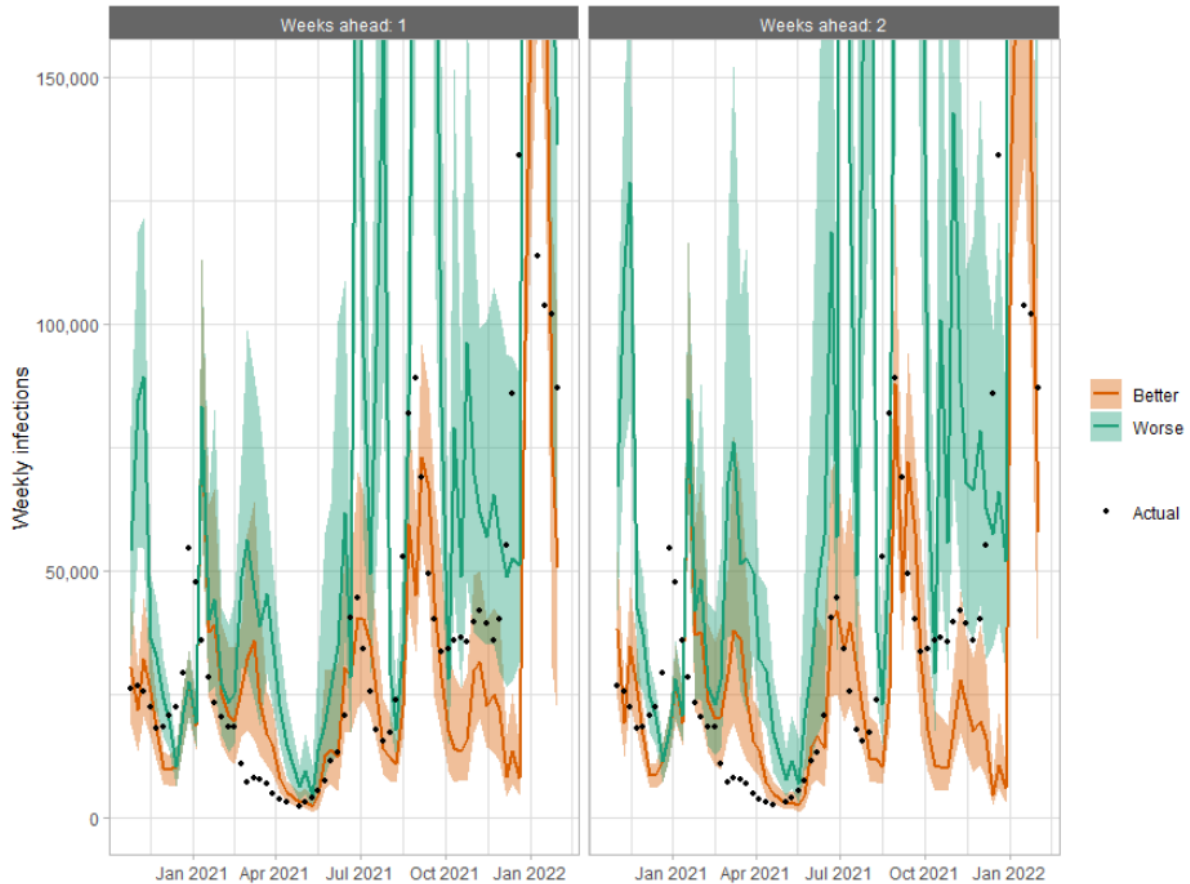
The delivery of the vaccination programme will offer protection against severe disease and death. The modelling includes assumptions about compliance with restrictions and vaccine take-up. Work is still ongoing to understand how many vaccinated people might still spread the virus if infected. As Covid-19 is a new disease there remain uncertainties associated with vaccine effectiveness. Furthermore, there is a risk that new variants emerge for which immunisation is less effective.

How the modelling compares to the real data as it emerges

The following charts show the history of our modelling projections in comparison to estimates of the actual data. The infections projections were largely accurate from mid-January 2021 until mid-December 2021, from which point the projections have underestimated the number of infections, due to the unforeseen effects of the Omicron variant. The same is true for the hospital beds projections, however the ICU beds

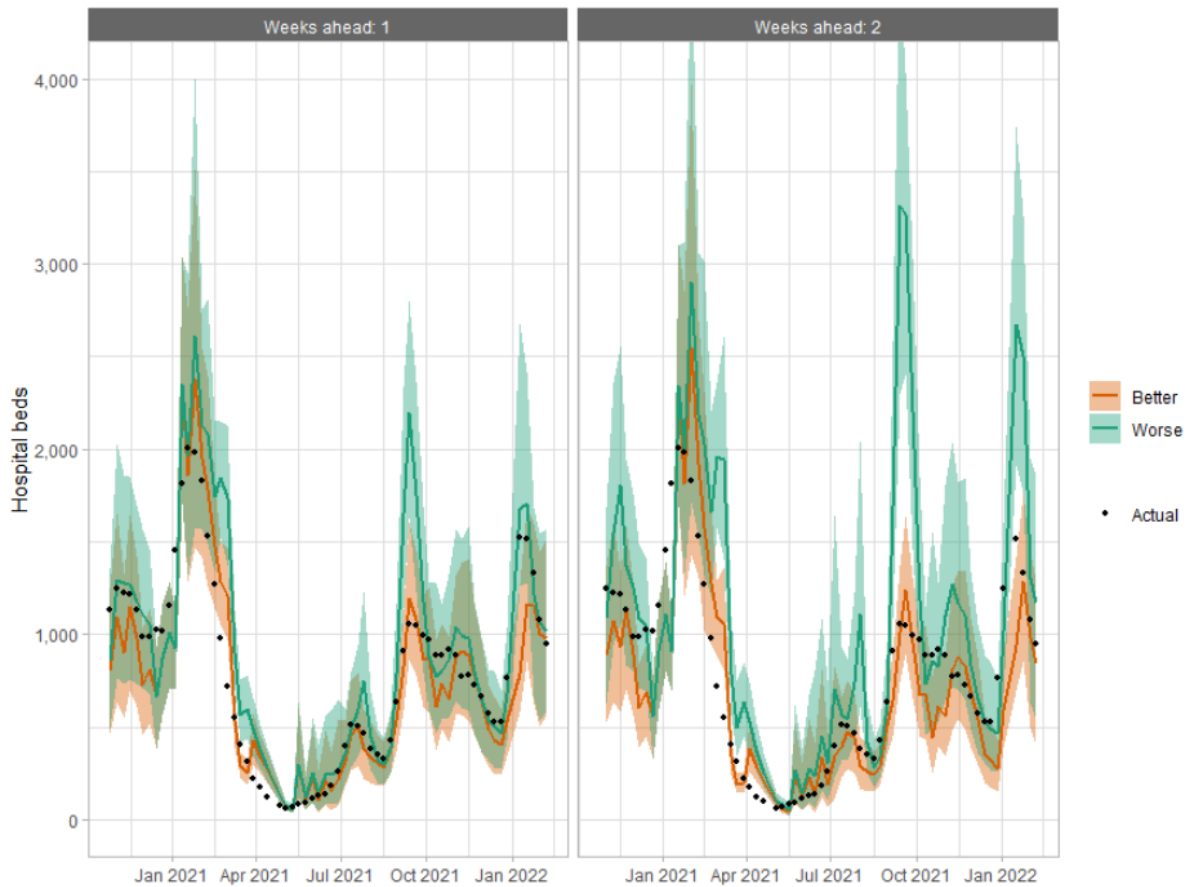
projections have overestimated the actual figures since mid-December 2021, due to the lower severity of Omicron.

Figure 21. Infections projections versus actuals, for historical projections published between one and two weeks before the actual data came in.



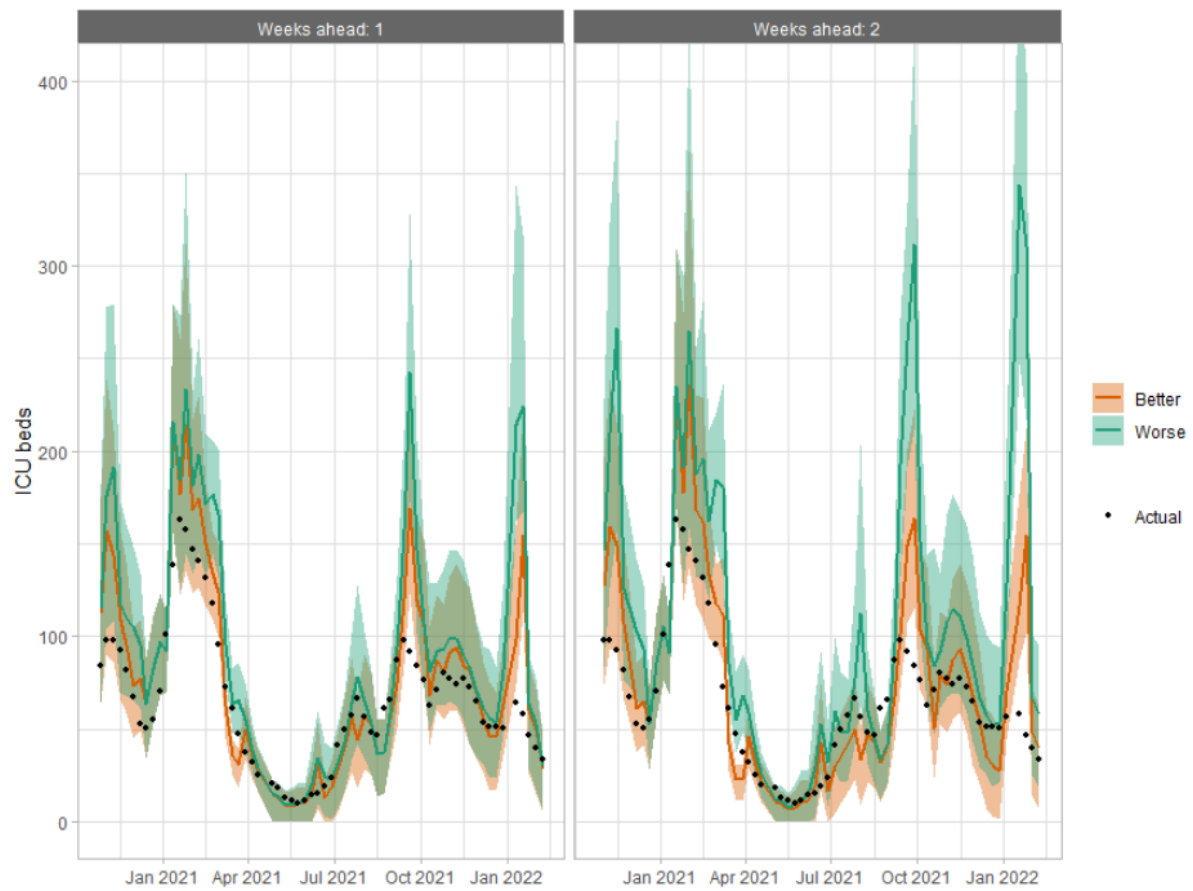
Hospital bed projections have generally been more precise than infections estimates due to being partially based on already known information about numbers of current infections, and number of people already in hospital. The projections are for number of people in hospital due to Covid-19, which is slightly different to the actuals, which are number of people in hospital within 28 days of a positive Covid-19 test.

Figure 22. Hospital bed projections versus actuals, for historical projections published between one and two weeks before the actual data came in.



As with hospital beds, ICU bed projections have generally been more precise than infections. The projections are for number of people in ICU due to Covid-19. The actuals are number of people in ICU within 28 days of a positive Covid-19 test up to 20 January 2021, after which they include people in ICU over the 28 day limit.

Figure 23. ICU bed projections versus actuals, for historical projections published between one and two weeks before the actual data came in.



Which local authorities are likely to experience high levels of Covid-19 in two weeks' time

Table 1. Probability of local authority areas exceeding thresholds of cases per 100K (20th February to 26th February 2022).

Data to 7th February.

Local Authority (LA)	Probability of exceeding (cases per 100K)			
	50	100	300	500
Aberdeen City	75-100%	75-100%	75-100%	50-75%
Aberdeenshire	75-100%	75-100%	50-75%	25-50%
Angus	75-100%	75-100%	50-75%	25-50%
Argyll and Bute	75-100%	75-100%	25-50%	5-15%
City of Edinburgh	75-100%	75-100%	75-100%	50-75%
Clackmannanshire	75-100%	75-100%	25-50%	15-25%
Dumfries & Galloway	75-100%	75-100%	25-50%	15-25%
Dundee City	75-100%	75-100%	75-100%	75-100%
East Ayrshire	75-100%	75-100%	50-75%	25-50%
East Dunbartonshire	75-100%	75-100%	25-50%	15-25%
East Lothian	75-100%	75-100%	25-50%	15-25%
East Renfrewshire	75-100%	75-100%	25-50%	15-25%
Falkirk	75-100%	75-100%	25-50%	15-25%
Fife	75-100%	75-100%	50-75%	25-50%
Glasgow City	75-100%	75-100%	50-75%	25-50%
Highland	75-100%	75-100%	50-75%	25-50%
Inverclyde	75-100%	75-100%	50-75%	25-50%
Midlothian	75-100%	75-100%	75-100%	50-75%
Moray	75-100%	75-100%	50-75%	25-50%
Na h-Eileanan Siar	25-50%	15-25%	0-5%	0-5%
North Ayrshire	75-100%	75-100%	50-75%	25-50%
North Lanarkshire	75-100%	75-100%	25-50%	15-25%
Orkney Islands	50-75%	25-50%	0-5%	0-5%
Perth and Kinross	75-100%	75-100%	25-50%	15-25%
Renfrewshire	75-100%	75-100%	50-75%	25-50%
Scottish Borders	75-100%	75-100%	50-75%	50-75%
Shetland Islands	15-25%	5-15%	0-5%	0-5%
South Ayrshire	75-100%	50-75%	25-50%	5-15%
South Lanarkshire	75-100%	75-100%	25-50%	15-25%
Stirling	75-100%	75-100%	50-75%	25-50%
West Dunbartonshire	75-100%	75-100%	25-50%	25-50%
West Lothian	75-100%	75-100%	50-75%	25-50%

What levels of Covid-19 are indicated by wastewater data?

Table 2 provides population weighted daily averages for normalised WW Covid-19 levels in the weeks ending 31st January and 7th February 2022, with no estimate for error. This is given in Million gene copies per person per day. Coverage is given as percentage of LA inhabitants covered by a wastewater Covid-19 sampling site delivering data during this period¹².

Table 2. Average Covid-19 wastewater levels (Mgc/p/d)¹³.

Local authority (LA)	w/e 31 st January	w/e 7th February	Coverage
Aberdeen City	62	105	99%
Aberdeenshire	54	61	38%
Angus	61	88	68%
Argyll and Bute	20	32	23%
City of Edinburgh	70	47	98%
Clackmannanshire	18	68	81%
Dumfries & Galloway	51	39	39%
Dundee City	74	117	100%
East Ayrshire	28	26	72%
East Dunbartonshire	61	28	99%
East Lothian	70	45	65%
East Renfrewshire	51	41	95%
Falkirk	52	42	96%
Fife	42	53	84%
Glasgow City	57	32	98%
Highland	39	26	35%
Inverclyde	28	29	98%
Midlothian	70	46	88%
Moray	–	23	42%
Na h-Eileanan Siar	–	–	0%
North Ayrshire	28	17	93%
North Lanarkshire	54	77	83%
Orkney Islands	40	35	34%
Perth and Kinross	22	109	38%
Renfrewshire	47	36	97%
Scottish Borders	29	34	55%
Shetland Islands	–	–	0%
South Ayrshire	28	30	88%
South Lanarkshire	58	55	59%
Stirling	12	12	63%
West Dunbartonshire	48	41	98%
West Lothian	45	68	95%

¹² Advancements in detection and interpretation practices allow us to identify when outlying results are anomalous rather than indicators of spikes in Covid-19 levels. Table 3 provides population weighted daily averages for normalised WW Covid-19 levels with the outliers removed. See Technical Annex in Issue 60 of these Research Findings for further details.

¹³ Coverage as for week ending 7th February 2022.

This publication will be available in accessible HTML on the [gov.scot](http://www.gov.scot) website

© Crown copyright 2022

You may re-use this information (excluding logos and images) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence, visit <http://www.nationalarchives.gov.uk/doc/open-government-licence/> or e-mail: psi@nationalarchives.gsi.gov.uk. Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned.

The views expressed in this report are those of the researchers and do not necessarily represent those of the Scottish Government or Scottish Ministers.

This document is also available from our website at www.gov.scot.
ISBN: 978-1-80435-051-5

The Scottish Government
St Andrew's House
Edinburgh
EH1 3DG

Produced for
the Scottish Government
by APS Group Scotland
PPDAS1027059 (02/22)
Published by
the Scottish Government,
February 2022



ISBN 978-1-80435-051-5

Web Publication

PPDAS1027059 (02/22)