IEMAG briefing

3 December 2020

Coronavirus COVID-19 Public Health Advice

Cases, numbers in hospital and intensive care

Case numbers are less than a quarter of what they were in late October, but in recent weeks have not been decreasing as rapidly. The number of people in hospital is decreasing slowly, numbers in ICU and deaths per day are not decreasing.

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	16 Apr	24 Jun	29 Jul	26 Aug	30 Sept	21 Oct	4 Nov	11 Nov	18 Nov	25 Nov	2 Dec
Cases confirmed per day	547	10	18	117	356	1160	579	403	412	303	273
14-day incidence *per 100,000 population*	157	4.0	5.6	32	92	288	211	144	120	105	85
Hospital in-patients	858	42	11	22	108	279	322	288	270	284	244
Hospital admissions per day	*56*	*2*	*2*	*3*	*10*	*23*	*19*	*21*	*20*	*18*	*14*
ICU confirmed cases	147	15	5	6	18	32	43	39	34	33	32
ICU admissions per day	*8*	*< 1*	*< 1*	*< 1*	*2*	*3*	*3*	*3*	*2*	*2*	*2*
Deaths confirmed per day	32	< 1	< 1	< 1	1	5	5	5	6	6	7

Data are 7-day averages (the indicated day and the preceding 6 days, rounded to the nearest whole number) with the exception of 14 day cumulative incidence, which is the total number of cases in the preceding 14 days per 100,000 population. NPHET monitors 5-day moving average and 14-day cumulative incidence on a day-by-day basis, as indicators of rate of change of incidence and overall burden of infection. 7-day averages are used here to limit day-of-week effects. The historic incidence data may change due to denotification of cases.

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Testing

The numbers of tests remains high, the positivity rate is stable.

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7-day average	15 Apr	23 Jun	28 Jul	25 Aug	29 Sept	20 Oct	3 Nov	10 Nov	17 Nov	24 Nov	1 Dec
Tests done per day	5579	2607	6494	7742	12624	16030	12662	10929	11042	11119	10663
% tests positive	18%	0.5%	0.4%	1.7%	3.0%	7.1%	4.5%	3.5%	3.8%	2.7%	2.7%

Data are 7-day averages (the indicated day and the preceding 6 days). The aggregate positivity rate should be interpreted with caution, as it includes community referrals, close contacts, mass and serial testing, and hospital testing, and changes in numbers of tests done in these different settings will alter the overall positivity rate.

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Confirmed cases each day

Daily and weekly count and 5-day rolling average – case counts have been decreasing since 21 October; the 5-day average peaked at 1186, and is now 264.

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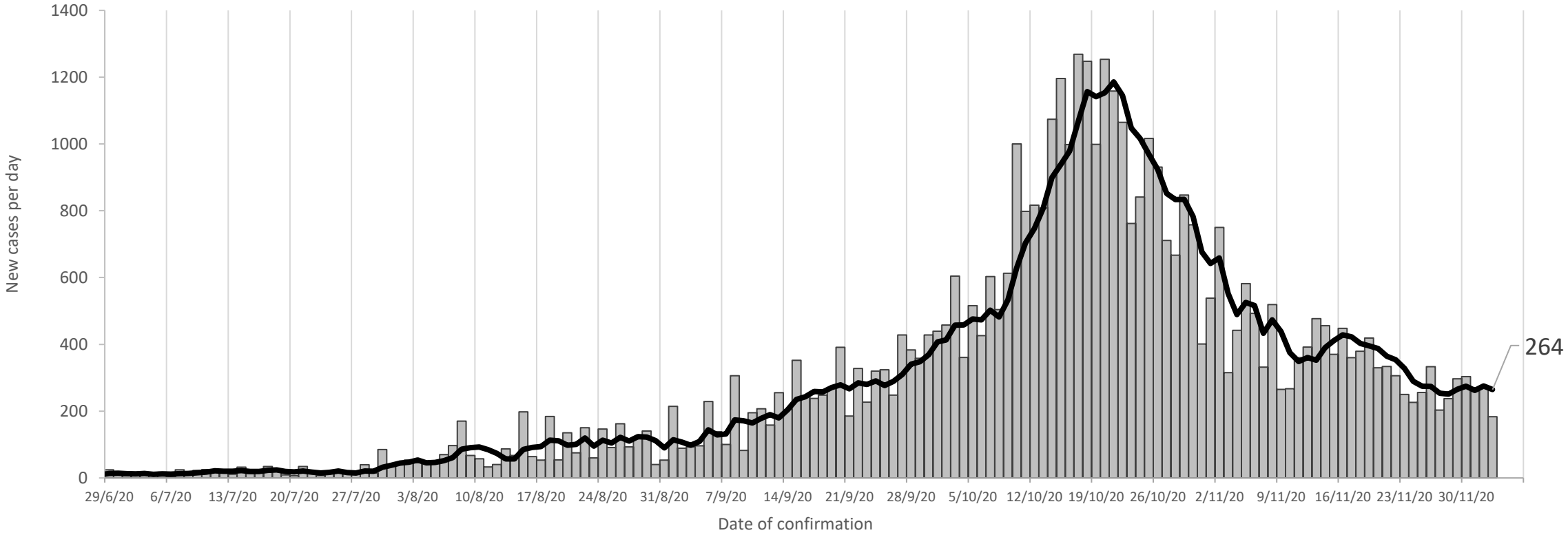
Cases confirmed each week	93	125	140	119	284	540	546	711	796	912	1303	1948	2060	3031	4460	7410	7097	4853	3433	2587	2576	1802



Daily count (bars) 5-day average (line) and weekly counts of the number of laboratory confirmed new cases by date on which they were confirmed by HPSC. Case counts may change due to denotification of cases. Sporadic cases are those cases not associated with outbreaks, nor close contacts of confirmed cases, nor acquired in the healthcare setting.

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14-day cumulative incidence

14-day cumulative incidence peaked at 170 per 100,000 in late April, declined to 3 per 100,000 in late June, peaked again on 26 October at 307 per 100,000, and is now 80 per 100,000

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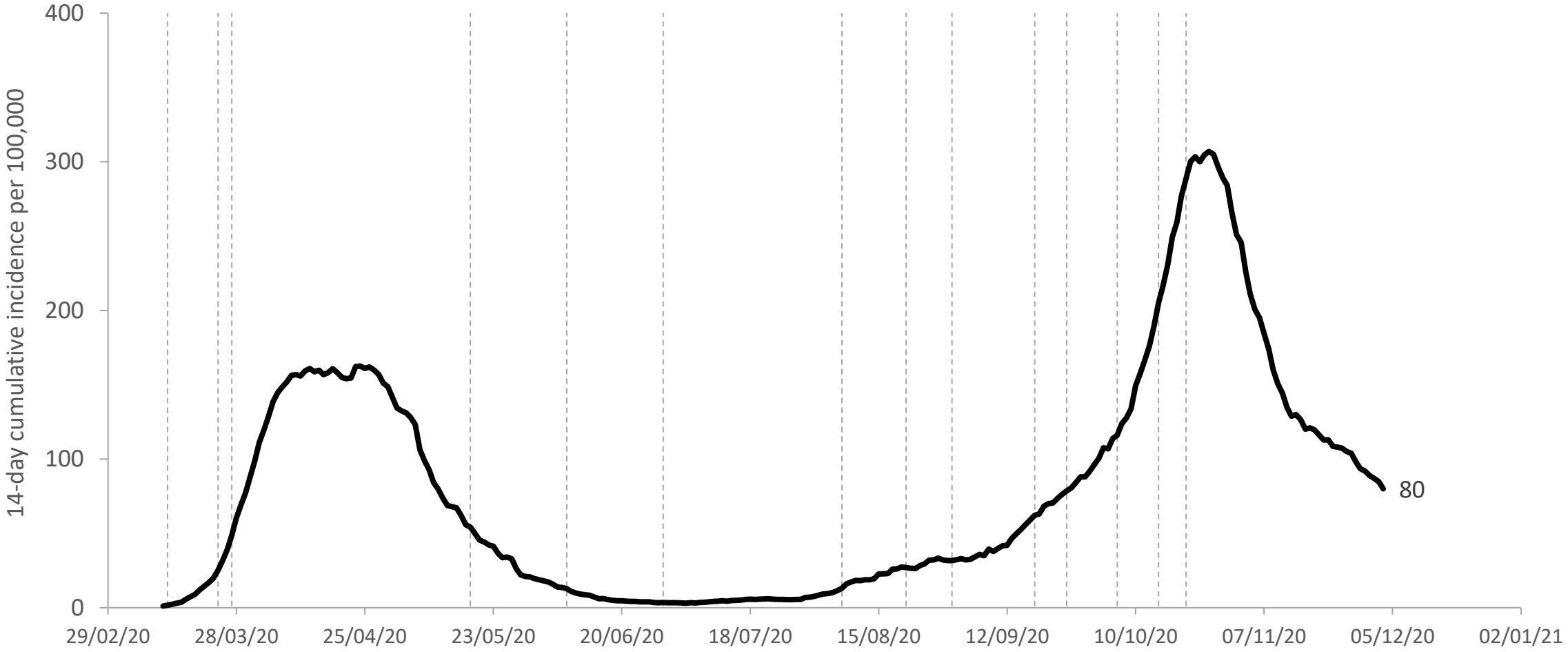

14-day cumulative incidence by date of confirmation. Tests outsourced to German laboratory in April backdated, using the specimen collection date, to the date they would have been confirmed if tested in a timely manner. The vertical dashed lines indicate the dates of escalation and de-escalation of public health restrictions

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Geographical distribution

14-day incidence by local electoral area, and how it has changed in recent weeks

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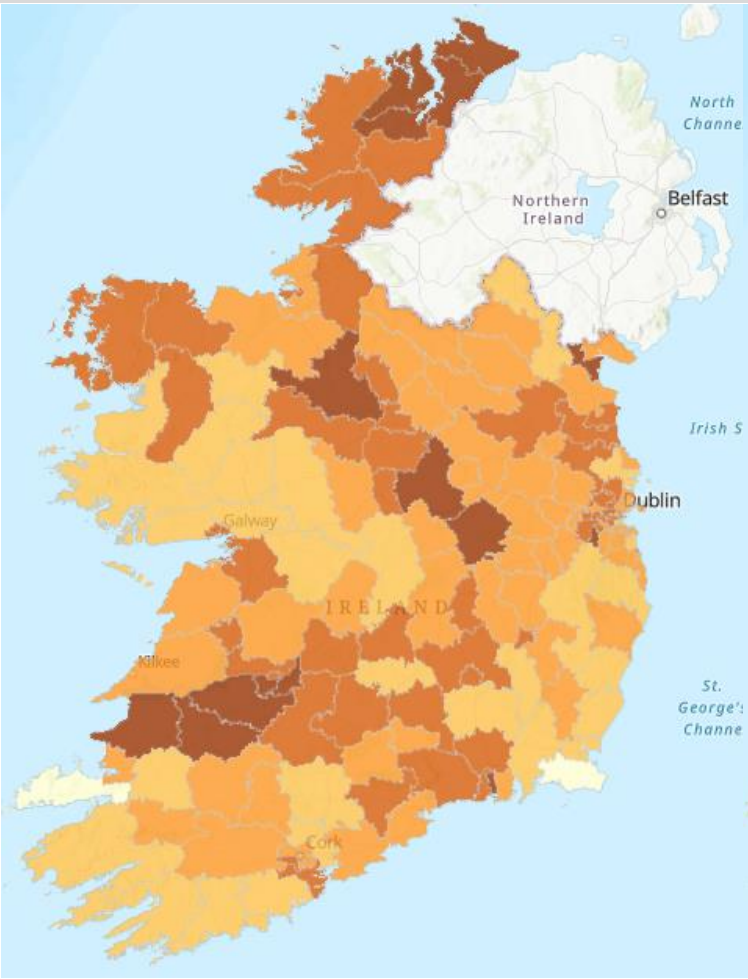
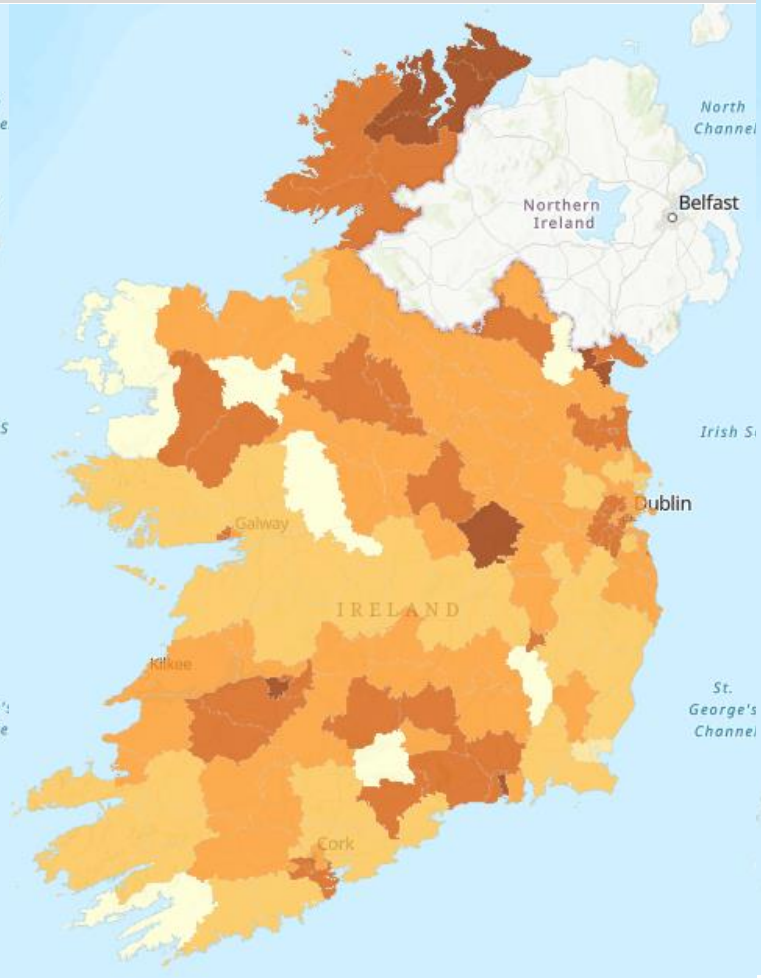
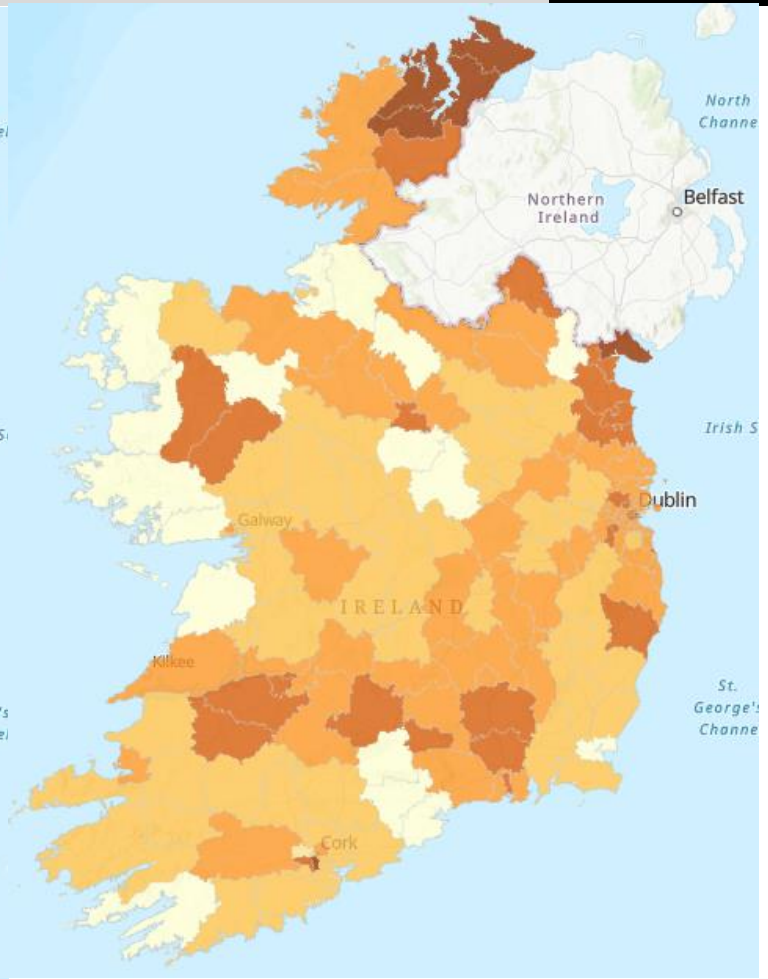


3 Nov - 16 Nov



10 Nov - 23 Nov



17 Nov - 30 Nov

14-day incidence per 100,000 population

- >240
- >120-240
- >60-120
- >20-60
- 5-20
- <5

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Test positive rates: public health laboratories

The positivity rate has been higher in recent weeks for tests conducted in public health laboratories (NVRL, associated laboratories and Cherry Orchard) compared with tests conducted in hospitals. Positivity rates are decreasing. Tests conducted as part of serial testing are not yet separated out in this analysis

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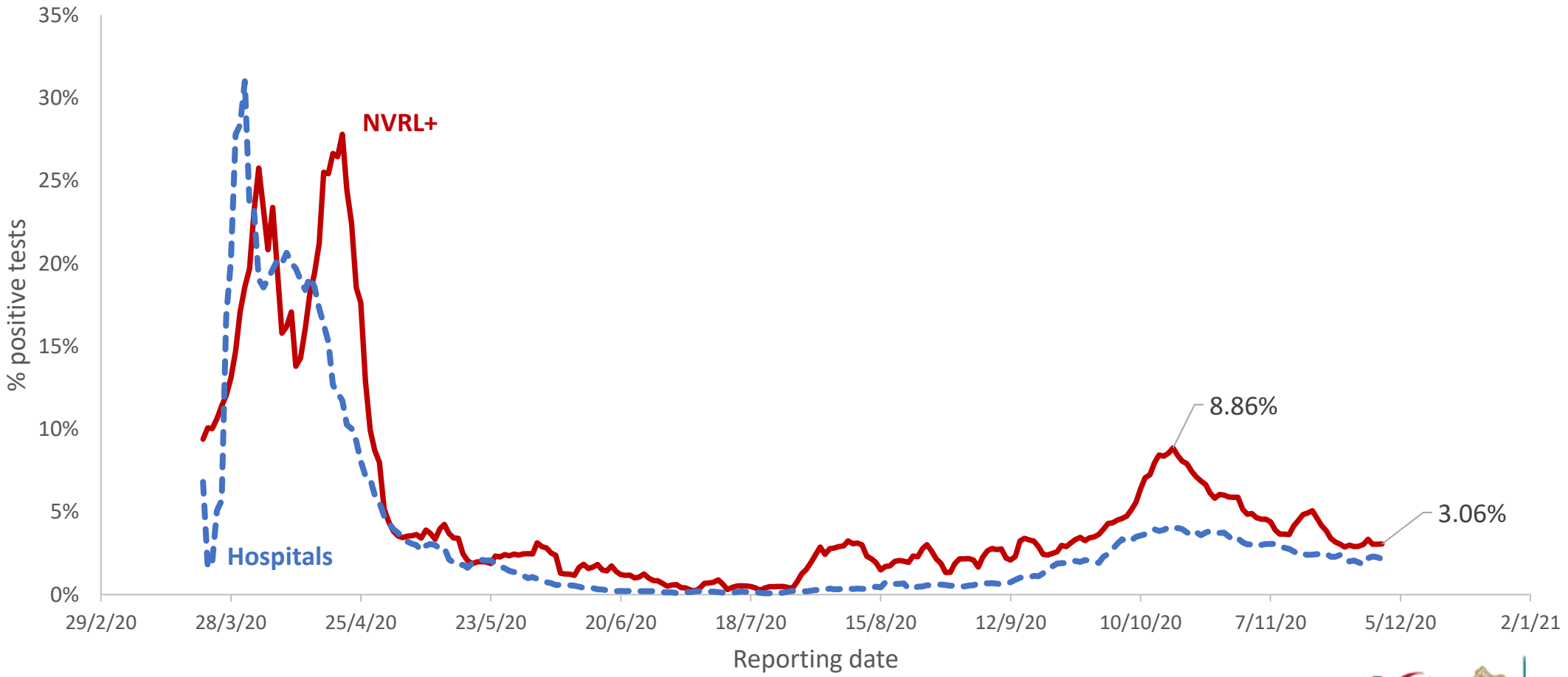

Data 5-day rolling averages of percentage of tests reported positive per day. NVRL+ is NVRL and associated laboratories, plus Cherry Orchard
Backlog tests outsourced to German laboratory in April are not backdated and are assigned to date reported

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Confirmed cases in acute hospitals

The number of people in hospital with confirmed SARS-CoV-2 infection is decreasing slowly

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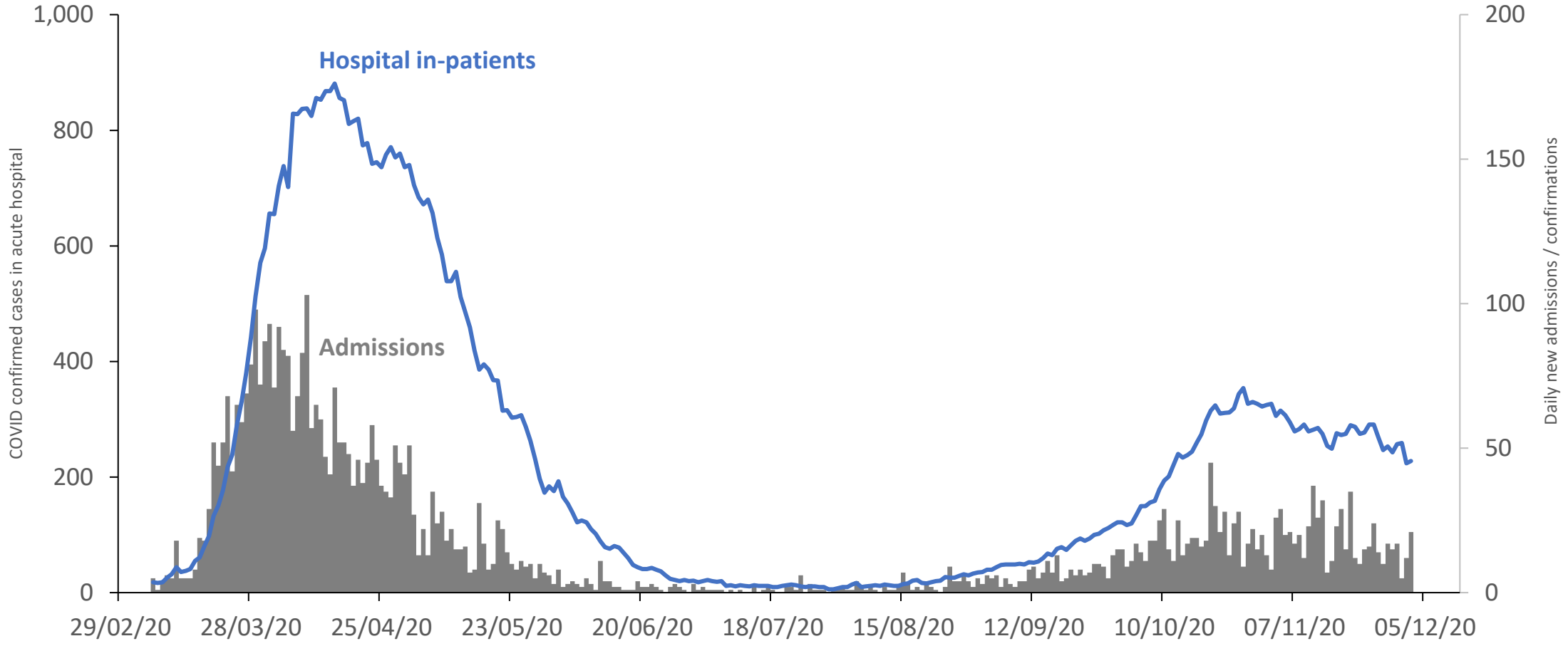

Hospital in-patients: Daily count of number of COVID-19 confirmed cases in acute hospitals. Daily admissions: New COVID-19 confirmed admissions and new laboratory confirmations of suspected cases in preceding 24 hours. Data from HSE PMIU-SDU, 8am census.

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Confirmed cases in intensive care

The number of people in ICU with confirmed SARS-CoV-2 infection is static or decreasing very slowly

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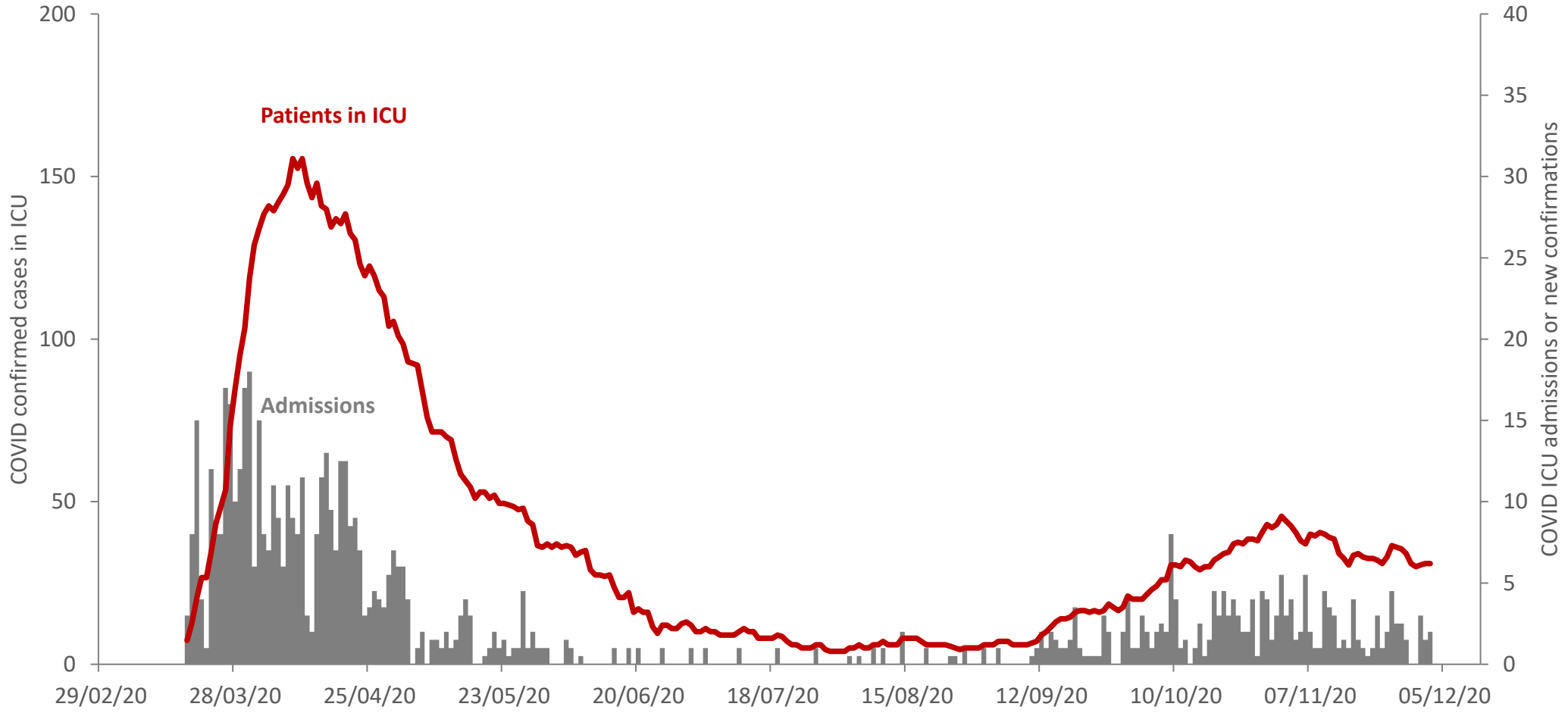

Patients in ICU: Daily count of number of COVID-19 confirmed cases in ICU. Daily admissions: new COVID-19 confirmed admissions to ICU and new laboratory confirmations of suspected cases in ICU. Average of morning and evening census from NOCA

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Deaths per day

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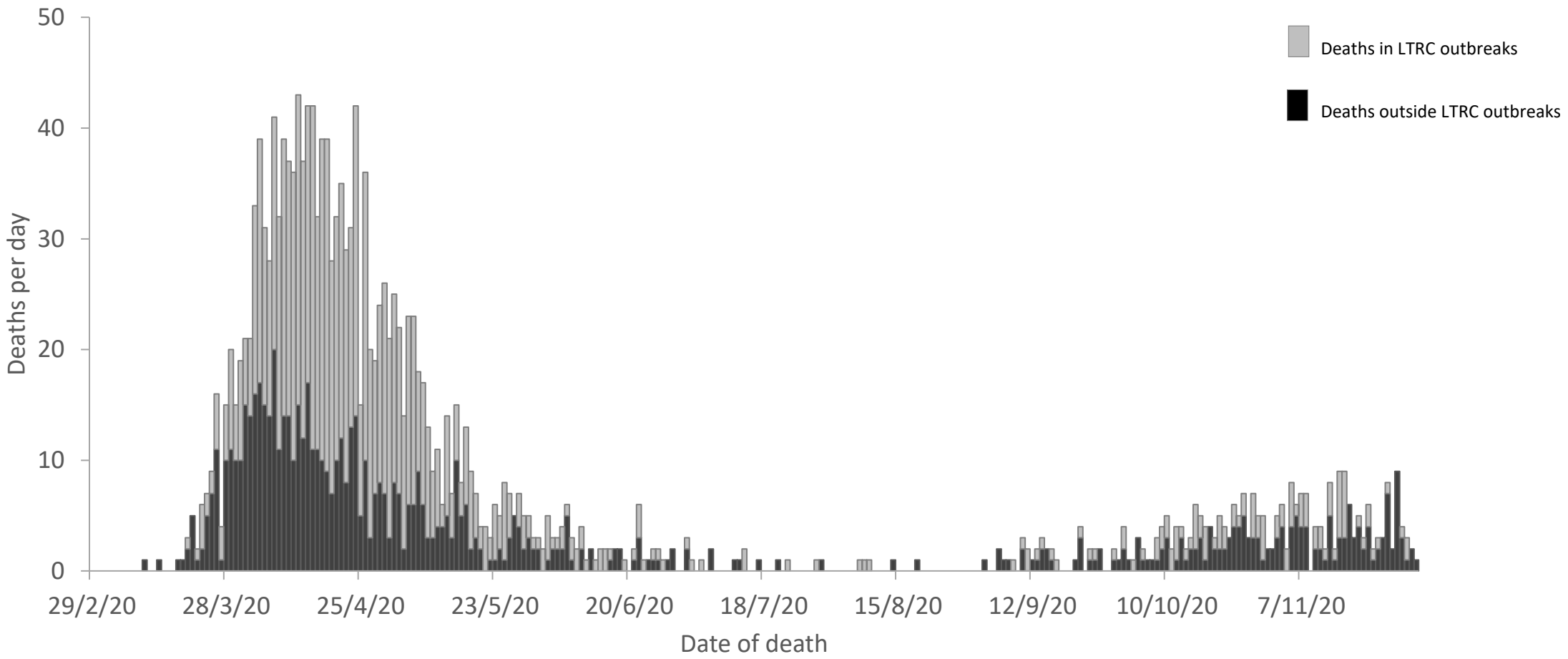

Deaths per day, separated into those associated with outbreaks in long-term residential care and those not associated with such outbreaks. Deaths with laboratory confirmed SARS-CoV-2 only

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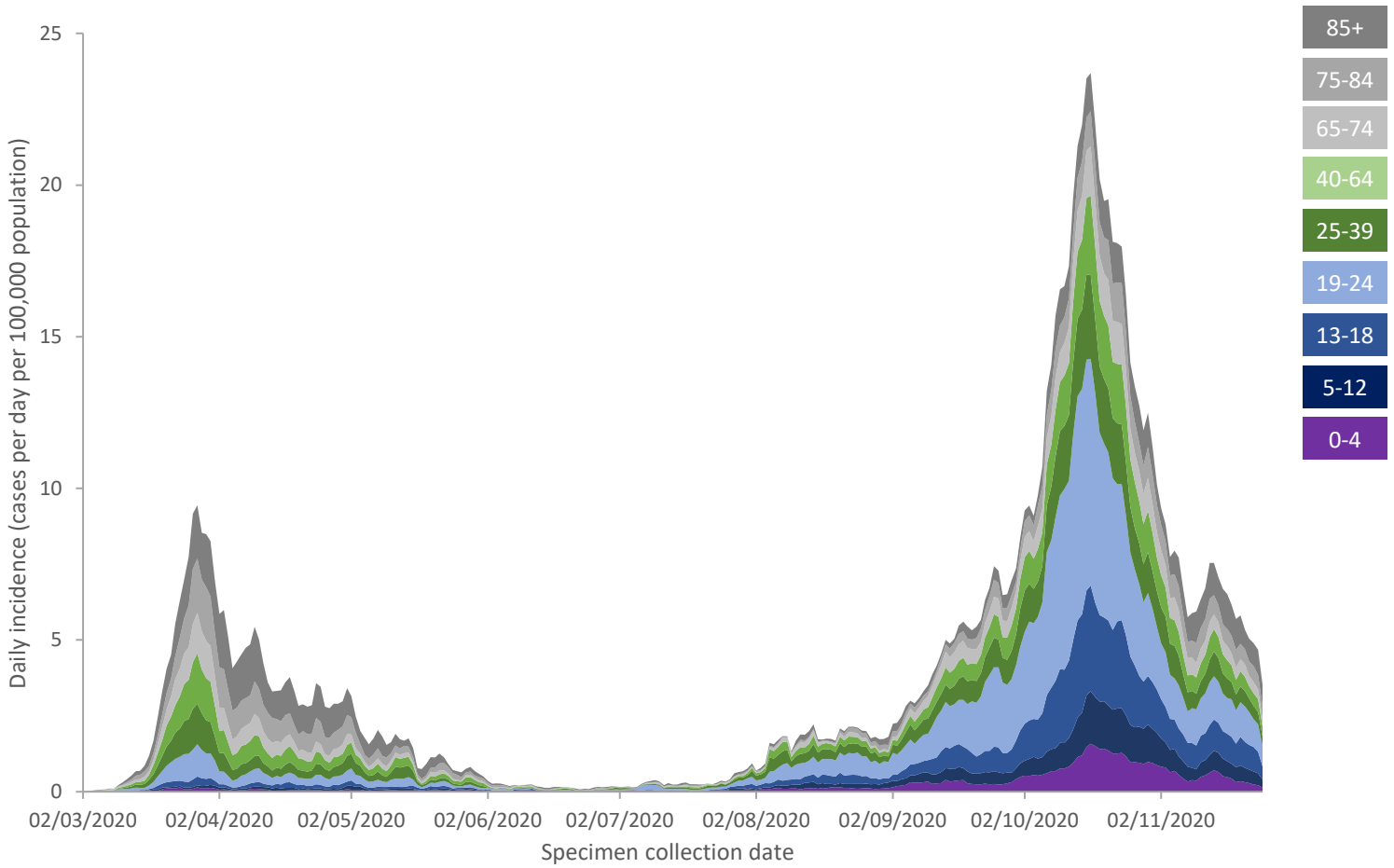
Incidence across different age groups (excluding HCW and LTRC)

When incidence started to rise again in July, cases increased first in younger age groups, especially in the 19-24 age group, with a delayed increase in incidence in older (65+) adults. There has been a very significant decrease in incidence in younger adults in recent weeks. While incidence in the 65-84 age group has decreased from the peak, it remains high in the 85+ age group.



Heat map of 7-day incidence by age

Week	Age band								
	0-4	5-12	13-18	19-24	25-39	40-64	65-74	75-84	85+
9	0.0	0.0	0.3	0.0	0.1	0.1	0.0	0.0	0.0
10	0.0	0.2	0.3	0.0	0.2	0.7	0.5	1.0	0.0
11	0.6	0.2	0.5	5.4	5.0	4.4	4.6	6.6	5.9
12	4.5	2.4	7.5	23.6	27.8	31.2	25.4	24.9	28.1
13	6.9	4.2	14.5	58.0	73.4	86.5	72.6	88.5	84.4
14	4.5	4.4	6.7	28.1	40.2	50.9	51.1	92.1	109.5
15	5.7	5.6	9.1	32.0	29.2	47.7	46.9	71.8	108.1
16	3.0	5.3	10.8	18.7	20.8	31.9	28.4	50.4	69.6
17	3.3	4.2	7.8	21.1	23.7	26.6	21.2	50.4	60.7
18	4.5	6.4	9.4	20.2	26.0	21.0	18.7	37.1	44.4
19	2.1	2.7	4.8	13.3	15.3	14.5	10.4	18.8	31.1
20	3.6	1.6	4.8	12.1	16.4	12.0	6.7	9.2	10.4
21	3.3	2.7	4.6	8.5	6.3	8.2	7.5	15.3	20.7
22	2.1	2.4	2.2	4.2	5.1	6.8	4.0	4.6	4.4
23	1.2	0.5	1.3	3.0	0.7	1.9	1.6	5.6	3.0
24	2.7	0.7	1.3	1.5	1.4	1.4	1.6	2.0	1.5
25	0.0	0.4	0.5	1.8	1.4	1.0	0.8	0.5	1.5
26	0.6	0.2	0.3	1.8	1.5	0.7	0.8	1.5	3.0
27	1.5	0.4	0.3	1.8	1.9	0.9	0.0	1.0	0.0
28	0.9	1.1	1.1	10.9	2.0	1.1	1.9	1.0	3.0
29	1.2	0.4	0.8	3.0	3.3	1.9	2.4	1.5	3.0
30	1.8	0.5	1.6	3.6	4.3	0.9	1.9	0.0	1.5
31	4.8	2.6	7.3	11.2	8.6	4.6	2.1	2.5	1.5
32	4.5	3.8	6.7	19.9	16.7	11.0	4.8	2.5	3.0
33	6.6	10.4	12.9	28.7	20.5	12.5	8.6	2.5	5.9
34	6.6	6.9	16.7	34.7	15.3	10.5	5.6	5.1	1.5
35	6.0	9.5	13.2	36.2	18.0	10.7	4.8	8.7	5.9
36	13.3	13.7	17.8	48.6	22.8	14.0	11.0	12.2	14.8
37	17.5	17.5	29.9	64.3	28.4	24.7	22.8	8.7	7.4
38	21.4	26.2	44.1	90.3	44.4	34.9	32.9	19.8	14.8
39	12.4	22.8	42.8	148.2	50.4	42.2	33.2	31.0	17.8
40	30.2	29.0	63.2	171.5	68.6	58.8	34.5	27.0	19.2
41	43.7	46.8	135.4	320.3	116.5	91.7	62.4	52.9	53.3
42	84.5	96.0	203.5	445.9	161.7	149.1	96.1	69.2	59.2
43	76.9	88.9	169.3	294.1	117.8	116.6	80.6	82.4	68.1
44	54.0	67.4	93.9	154.3	74.7	76.9	55.4	55.5	47.4
45	34.4	39.7	57.6	83.3	58.9	46.7	43.4	43.8	42.9
46	41.9	37.0	65.1	91.2	46.3	45.8	32.9	43.3	57.7
47	21.7	34.3	58.9	80.0	35.5	33.7	27.8	37.7	53.3
48	22.3	28.4	39.0	61.3	33.2	28.5	22.0	38.2	59.2

Chart shows 5-day rolling average of total incidence (cases per day per 100,000 population) with coloured bands showing the contribution of each age cohort to the total incidence, having adjusted for the number of people in that age cohort (CSO 2016 census data). Heat map shows age-specific incidence (cases per week per 100,000 population) Healthcare workers and cases associated with outbreaks in long-term residential care are excluded, so that the analysis reflects the pattern of cases in the community. Cases dated by date of specimen collection.

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Incidence across different age groups (excluding HCW and LTRC)

When incidence started to rise again in July, cases increased first in younger age groups, especially in the 19-24 age group, with a delayed increase in incidence in older (65+) adults. There has been a very significant decrease in incidence in younger adults in recent weeks. While incidence in the 65-84 age group has decreased from the peak, it remains high in the 85+ age group.

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Heat map of 7-day incidence by age

Week	Age band								
	0-4	5-12	13-18	19-24	25-39	40-64	65-74	75-84	85+
25	0.0	0.4	0.5	1.8	1.4	1.0	0.8	0.5	1.5
26	0.6	0.2	0.3	1.8	1.5	0.7	0.8	1.5	3.0
27	1.5	0.4	0.3	1.8	1.9	0.9	0.0	1.0	0.0
28	0.9	1.1	1.1	10.9	2.0	1.1	1.9	1.0	3.0
29	1.2	0.4	0.8	3.0	3.3	1.9	2.4	1.5	3.0
30	1.8	0.5	1.6	3.6	4.3	0.9	1.9	0.0	1.5
31	4.8	2.6	7.3	11.2	8.6	4.6	2.1	2.5	1.5
32	4.5	3.8	6.7	19.9	16.7	11.0	4.8	2.5	3.0
33	6.6	10.4	12.9	28.7	20.5	12.5	8.6	2.5	5.9
34	6.6	6.9	16.7	34.7	15.3	10.5	5.6	5.1	1.5
35	6.0	9.5	13.2	36.2	18.0	10.7	4.8	8.7	5.9
36	13.3	13.7	17.8	48.6	22.8	14.0	11.0	12.2	14.8
37	17.5	17.5	29.9	64.3	28.4	24.7	22.8	8.7	7.4
38	21.4	26.2	44.1	90.3	44.4	34.9	32.9	19.8	14.8
39	12.4	22.8	42.8	148.2	50.4	42.2	33.2	31.0	17.8
40	30.2	29.0	63.2	171.5	68.6	58.8	34.5	27.0	19.2
41	43.7	46.8	135.4	320.3	116.5	91.7	62.4	52.9	53.3
42	84.5	96.0	203.5	445.9	161.7	149.1	96.1	69.2	59.2
43	76.9	88.9	169.3	294.1	117.8	116.6	80.6	82.4	68.1
44	54.0	67.4	93.9	154.3	74.7	76.9	55.4	55.5	47.4
45	34.4	39.7	57.6	83.3	58.9	46.7	43.4	43.8	42.9
46	41.9	37.0	65.1	91.2	46.3	45.8	32.9	43.3	57.7
47	21.7	34.3	58.9	80.0	35.5	33.7	27.8	37.7	53.3
48	22.3	28.4	39.0	61.3	33.2	28.5	22.0	38.2	59.2

Heat map shows age-specific incidence (cases per week per 100,000 population) Healthcare workers and cases associated with outbreaks in long-term residential care are excluded, so that the analysis reflects the pattern of cases in the community. Cases dated by date of specimen collection.

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Where are cases arising?

We have seen an increasing number of infections in healthcare workers in recent weeks, with approximately 11% of cases over the last 14 days being HCW.

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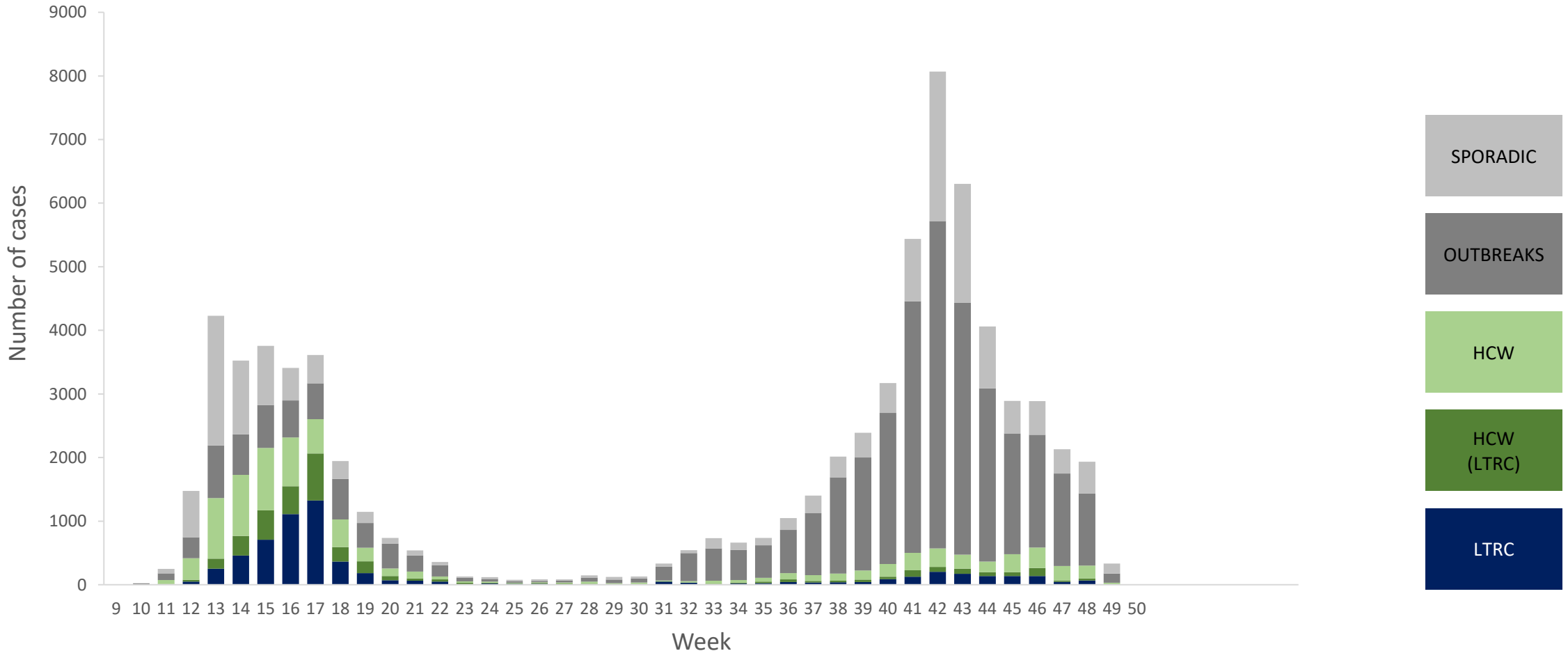

Weekly total cases by setting. LTRC: residents of long-term residential care. HCW (LTRC): Healthcare workers associated with outbreaks in long-term residential care. HCW: healthcare workers in other settings. Outbreaks: all other outbreaks. Sporadic: cases not associated with outbreaks or healthcare work. Date of specimen collection

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Persistence in healthcare workers and settings

While overall incidence decreased rapidly, there has been persistent and delayed incidence in healthcare workers and in LTRC, hospital and other healthcare outbreaks.

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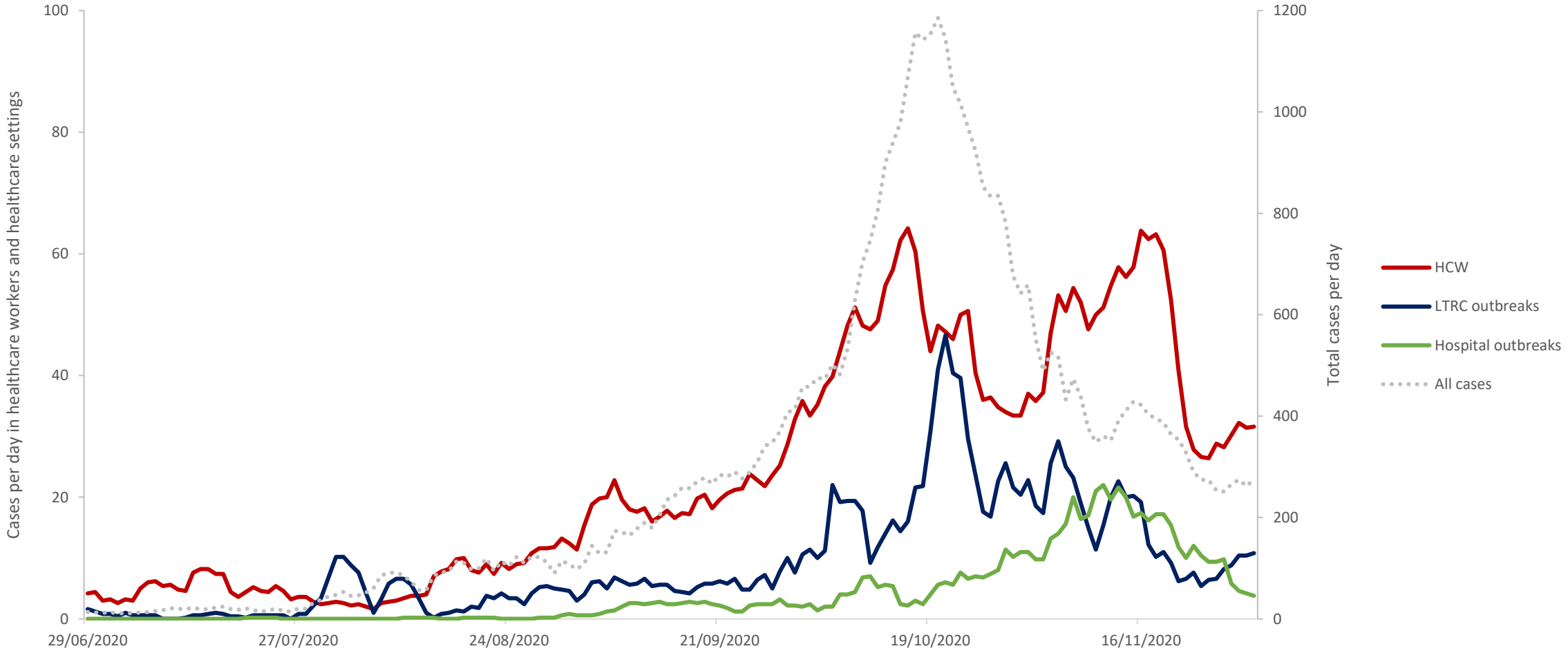

HCW: cases identified as healthcare workers. LTRC outbreaks: cases associated with outbreaks in long-term residential care that are not HCW.
Hospital outbreaks: cases associated with hospital and other healthcare outbreaks that are not HCW. Cases dated by event date.

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Close contacts

The mean number of close contacts per confirmed case. The number of contacts was very low (2 or less) during the very strict public health measures in April, but increased to 5-6 per case during the summer. The progressive escalation of public health measures during October was associated with a progressive reduction in close contacts, to below 3. The period immediately after the mid-term break was associated with an increase in close contacts

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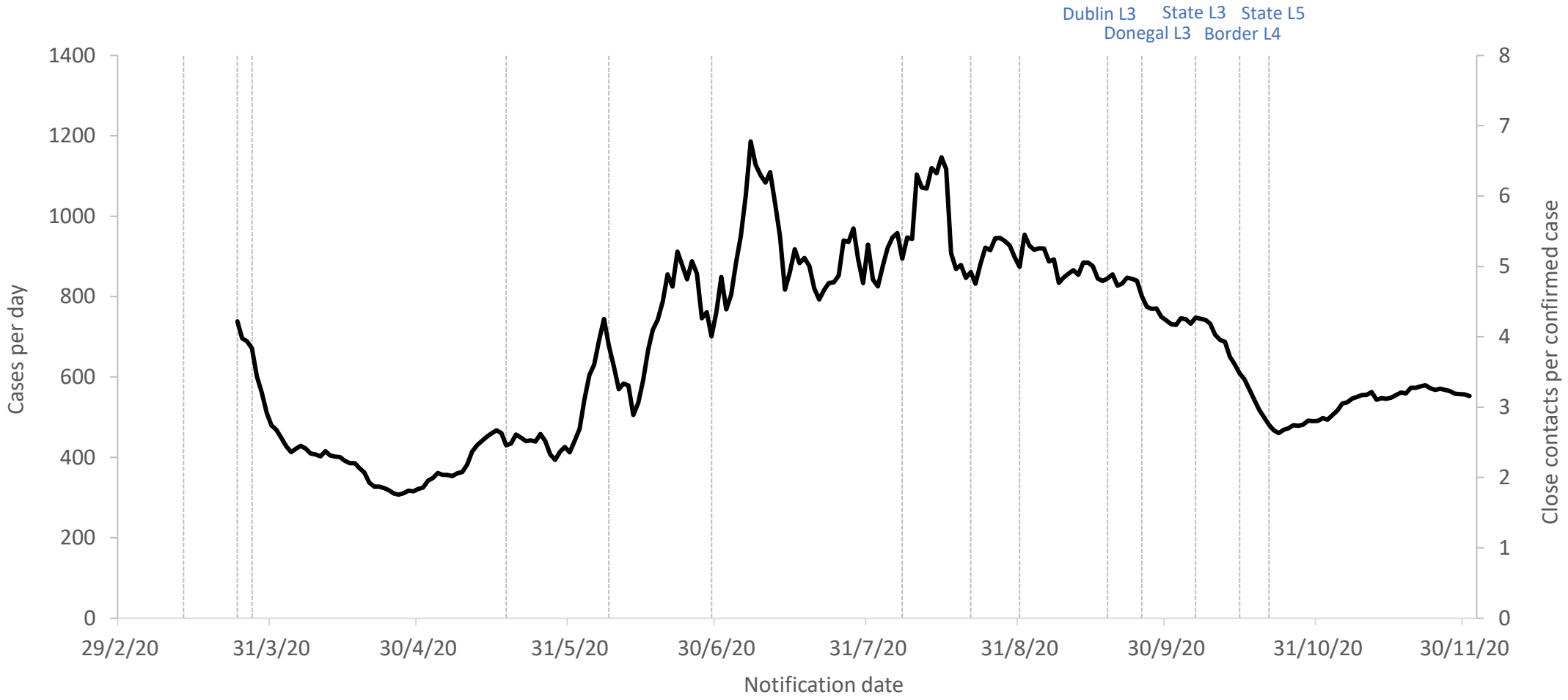

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Estimates of effective reproduction number (R)

Reproduction number is difficult to estimate as it is probably increasing – it is currently estimated at 0.8 to 1.0.

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Method	Estimate	95% confidence interval
SEIR model-inferred	0.69	0.54 – 0.83
Bayesian model	0.86	0.53 – 1.43
Time-dependent R	0.72	0.57 – 0.87
GAM estimate 24 Nov 2020	0.89	0.73 – 1.05
GAM estimate 1 Dec 2020	0.91	0.68 – 1.15

Estimates generated 2 December 2020, refer to IEMAG technical notes for methodology. Estimates are unreliable when case numbers are low or variable.
SEIR-inferred estimate is slow to respond to changes in R. These R estimates relate to viral transmissions and infections that occurred approximately 7-14 days ago.
The estimate of R is influenced by different patterns of transmission in large outbreaks, smaller clusters, and individual transmission.

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What do our models tell us?

Model calibrated to case data until *2 December 2020*, and projected case numbers are given for R in the range 1.1 to 1.6. Given that the starting force of infection now is significantly higher than in June, the infection spreads much more rapidly as R is increases above 1.0. This scenario sees 300-600 cases per day in the second week of January for R between 1.2 and 1.4

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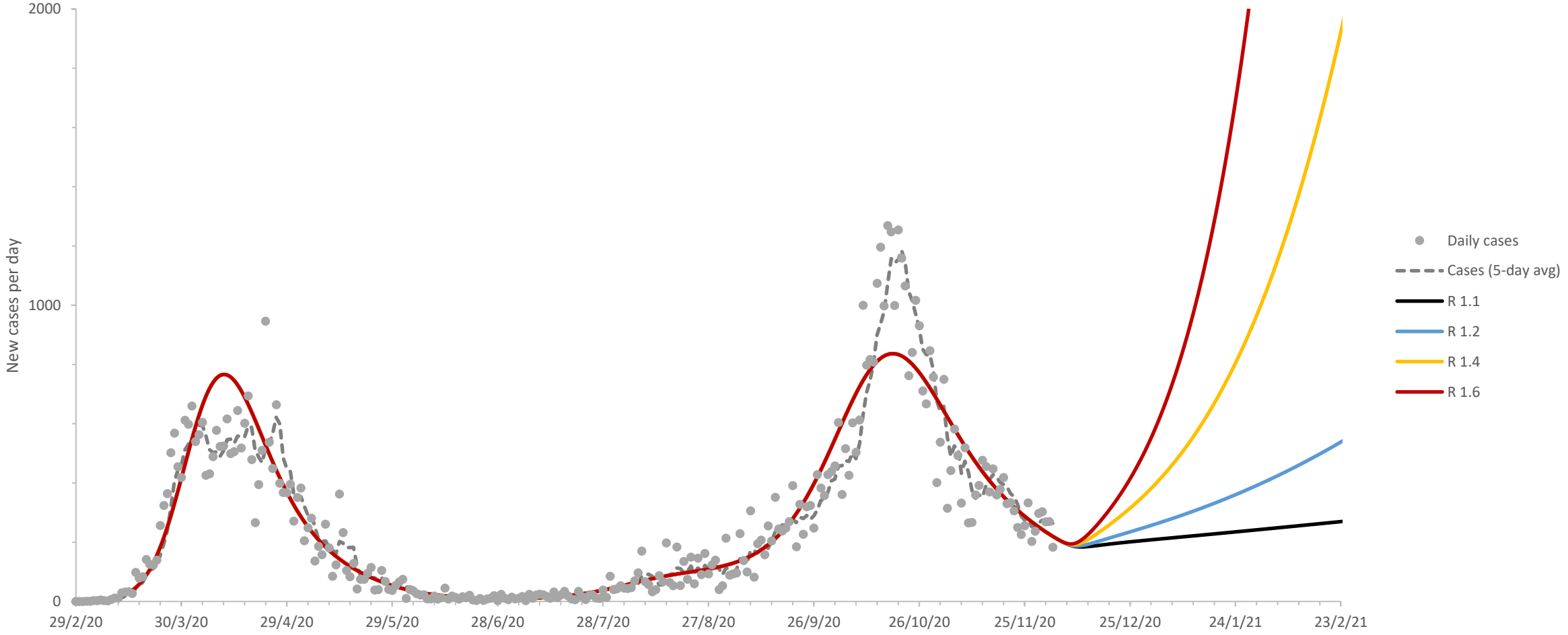

Model projections of the number of new cases per day. The model is calibrated with daily case counts to 2 December 2020; R varies between 1.1 and 1.6 thereafter. This is a scenario model only. It is not a forecast, nor does it imply or anticipate any future policy decision.

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What do our models tell us?

Model calibrated to case data until *2 December 2020* and projected case numbers are given for R in the range 1.1 to 1.6; an additional Christmas surge is modelled as R increasing to 2.0 for the period 22 December to 6 January. This scenario sees 800-1200 cases per day in mid-January for R between 1.2 and 1.4

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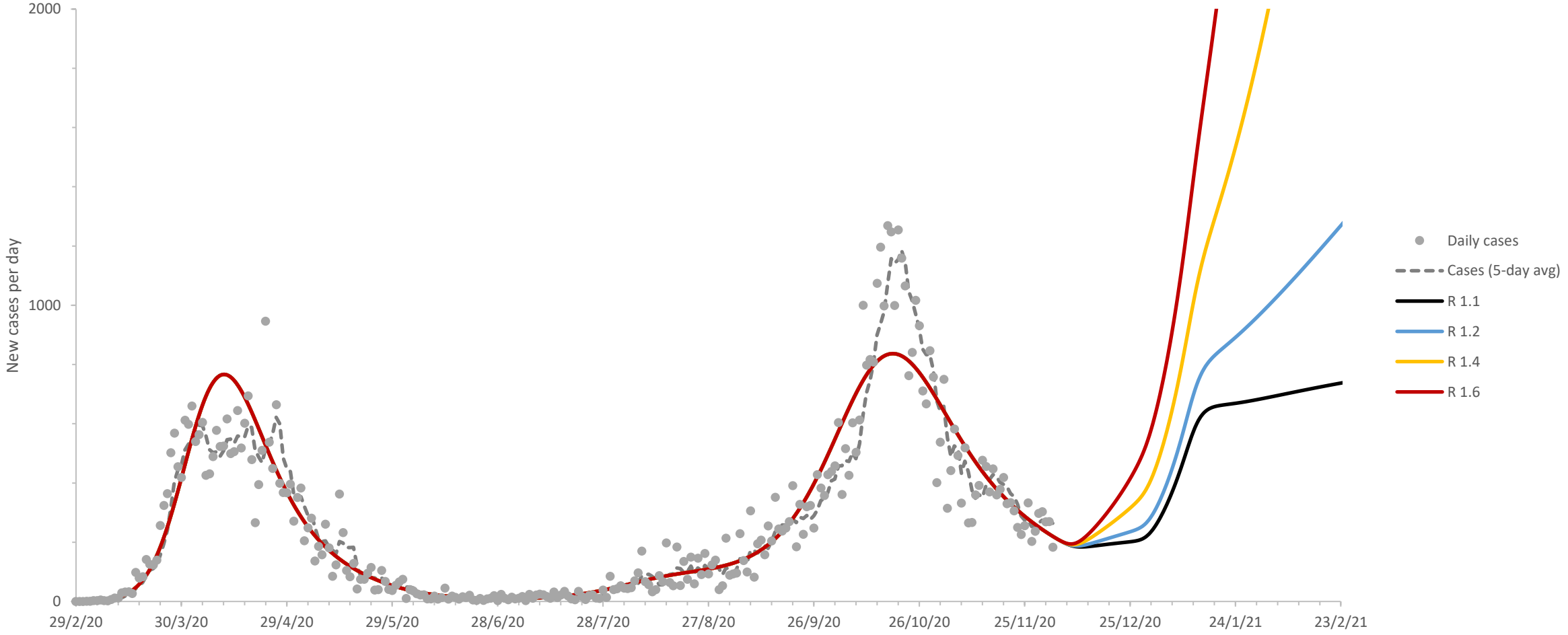

Model projections of the number of new cases per day. The model is calibrated with daily case counts to 2 December and run with R between 1.1 and 1.6. An additional Christmas surge is modelled as R increasing to 2.0 for the period 22 December 2020 to 6 January 2021 This is a scenario model only. It is not a forecast, nor does it imply or anticipate any future policy decision.

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Situation analysis 3 December 2020

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- We have made great progress over four weeks with significant suppression of viral transmission
  - Daily average case counts down from 1200 to 275
  - 14-day incidence down from 307 per 100,000 to 85 per 100,000
- The level of infection is static or decreasing slowly
    - growth rate 0% to -3%
    - R estimated at 0.8 – 1.0
      - caution in interpreting R number – it's an *estimate* that *lags* changes in viral transmission
- Persistent and delayed incidence in healthcare workers and outbreaks
- Numbers in hospital decreasing slowly, numbers in intensive care and deaths per day are not decreasing
- A persistently high incidence in older persons
- Measures of mobility and contact have increased in anticipation of the 1 December relaxation of public health restrictions
- We approach the Christmas period with higher case numbers, force of infection, and healthcare burden than we would have preferred.
- Extreme caution, limiting our number of contacts per week, and taking every precaution during such contacts, if we are to avert a significant surge of infection over the Christmas and New Year period