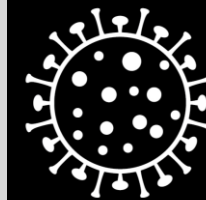


IEMAG briefing

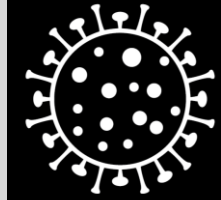
23 December 2020



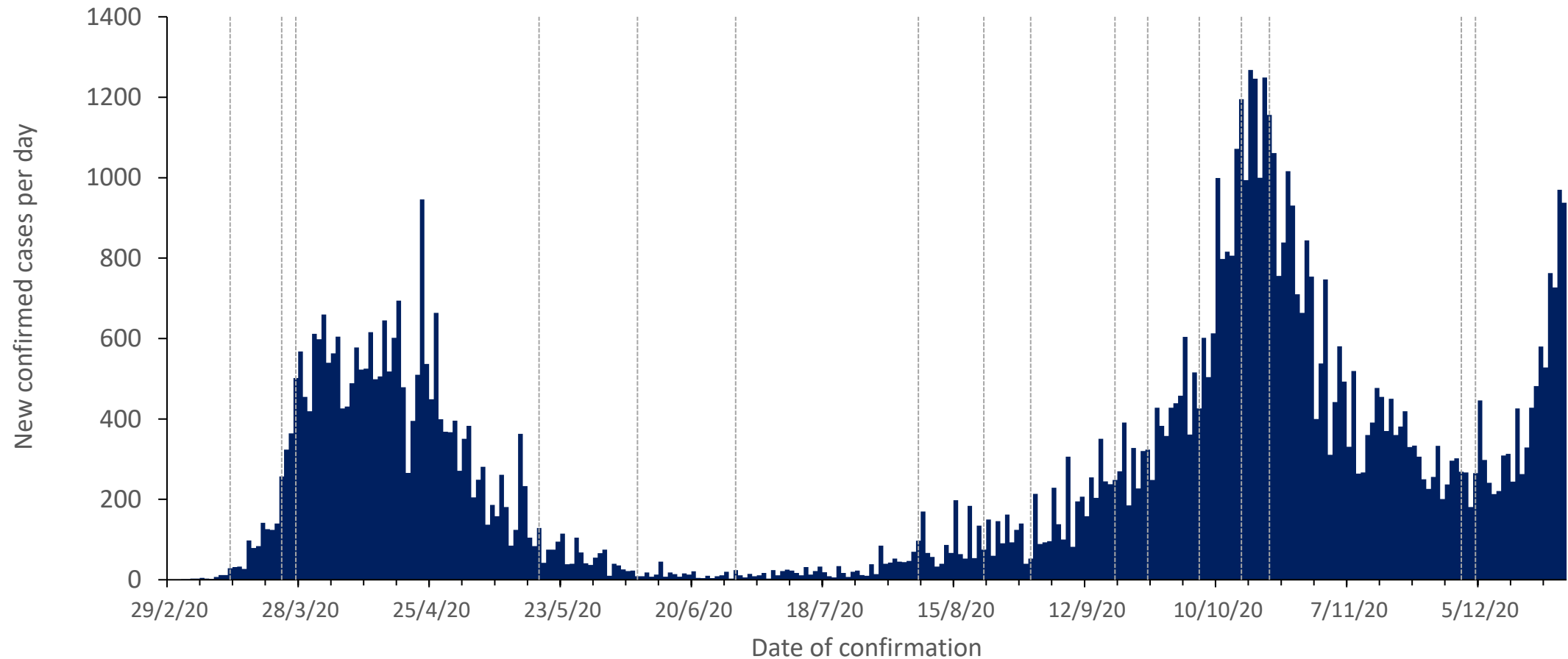
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Confirmed cases each day

Daily case count since the beginning of the epidemic



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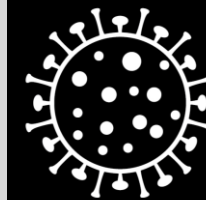
Daily count of the number of laboratory confirmed new cases by date on which they were confirmed by HPSC. Tests outsourced to German laboratory in April backdated, using the specimen collection date, to the date they would have been confirmed if tested in a timely manner. The vertical dashed lines indicate the dates of escalation and de-escalation of public health restrictions



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Cases, numbers in hospital and intensive care

Case numbers are rising rapidly. The number of people in hospital is increasing; the number 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	25 Nov	2 Dec	9 Dec	16 Dec	23 Dec
Cases confirmed per day	547	10	18	117	356	1160	303	272	268	330	713
14-day incidence <i>per 100,000 population</i>	157	4.0	5.6	32	92	288	105	85	79	88	153
Hospital in-patients	858	42	11	22	108	279	284	244	228	198	222
<i>Hospital admissions per day</i>	56	2	2	3	10	23	18	14	14	14	22
ICU confirmed cases	147	15	5	6	18	32	33	32	31	33	29
<i>ICU admissions per day</i>	8	< 1	< 1	< 1	2	3	2	2	3	1	2
Deaths confirmed per day	32	< 1	< 1	< 1	1	5	6	7	4	5	6

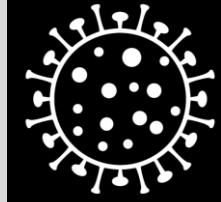
Data are 7-day averages (the indicated day and the preceding 6 days, rounded to the nearest whole number) with the exception of 14 day cumulative incidence, which is the total number of cases in the preceding 14 days per 100,000 population. NPHE monitors 5-day moving average and 14-day cumulative incidence 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 demand for tests is increasing, and positivity rate is increasing rapidly.



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7-day average	15 Apr	23 Jun	28 Jul	25 Aug	29 Sept	20 Oct	24 Nov	1 Dec	8 Dec	15 Dec	21 Dec
Tests done per day	5579	2607	6494	7742	12624	16030	11119	10663	11003	11870	14458
% tests positive	18%	0.5%	0.4%	1.7%	3.0%	7.1%	2.7%	2.7%	2.5%	2.8%	5.1%

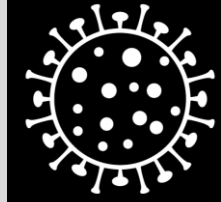
Data are 7-day averages (the indicated day and the preceding 6 days). The aggregate positivity rate should be interpreted with caution, as it includes community referrals, close contacts, mass and serial testing, and hospital testing, and changes in numbers of tests done in these different settings will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



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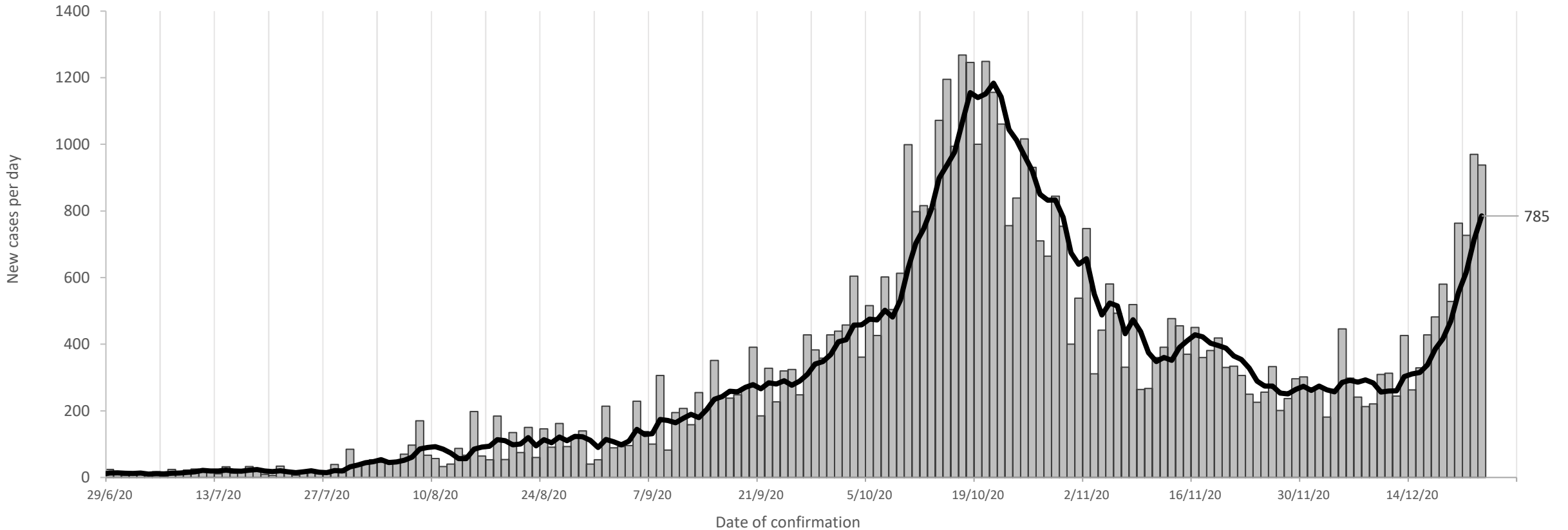
Confirmed cases each day

Daily and weekly count and 5-day rolling average. Case counts are much lower than in late October. The 5-day average peaked at 1186 on 21 October, reached a low of 251 on 28 November, and is now **785**



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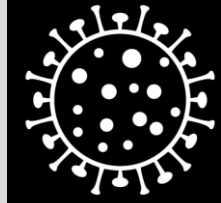
Cases per week	93	125	139	119	284	540	546	711	796	912	1303	1947	2060	3031	4458	7397	7077	4841	3424	2584	2580	1799	2028	1967	3373
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Daily count (bars) 5-day average (line) and weekly counts of the number of laboratory confirmed new cases by date on which they were confirmed by HPSC. Case counts may change due to denotification of cases. Weekly case counts are by event date from midnight Saturday to midnight Saturday.

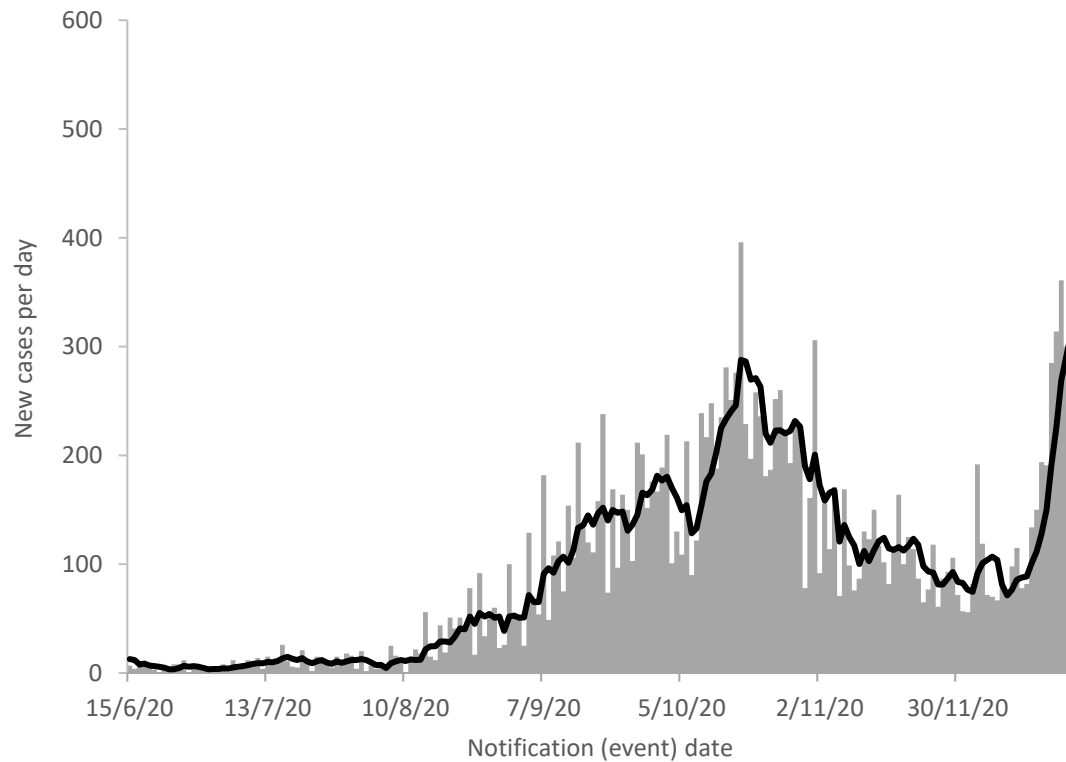
Confirmed cases each day

Daily case count and 5-day rolling average for Dublin alone and for the other 25 counties. Case counts are rising rapidly in Dublin and across the entire country. Case counts in Dublin now exceed the peak of the second wave.

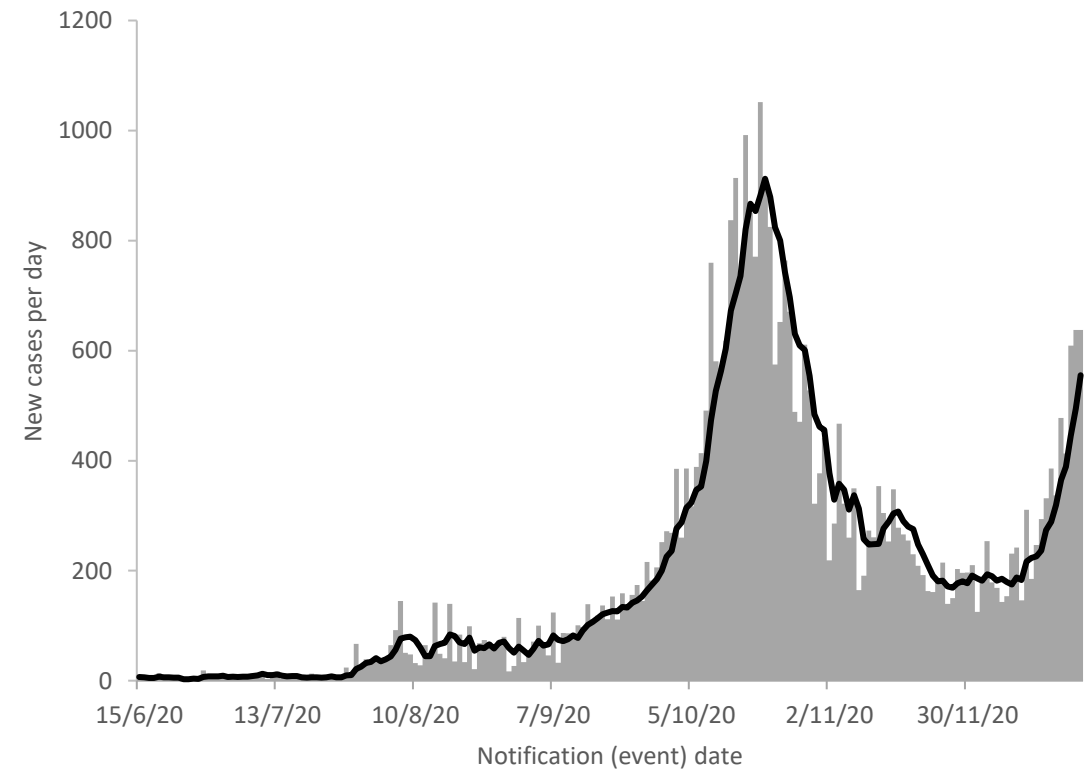


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Dublin



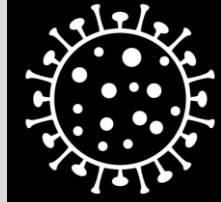
25 counties



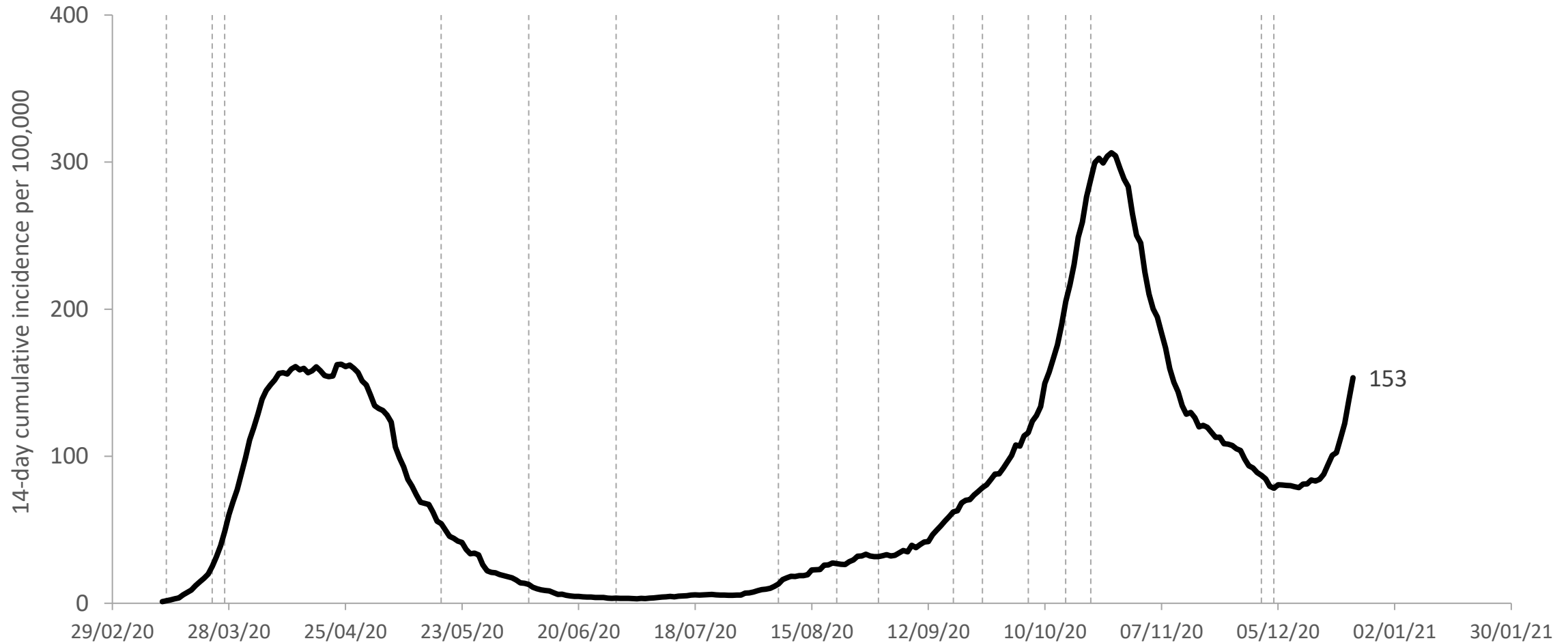
Daily count (bars) 5-day average (line) new cases by date on which they were notified to HPSC and created as an event on the CIDR database

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, reached a low of 78 per 100,000 on 4 December, and is now **153 per 100,000**



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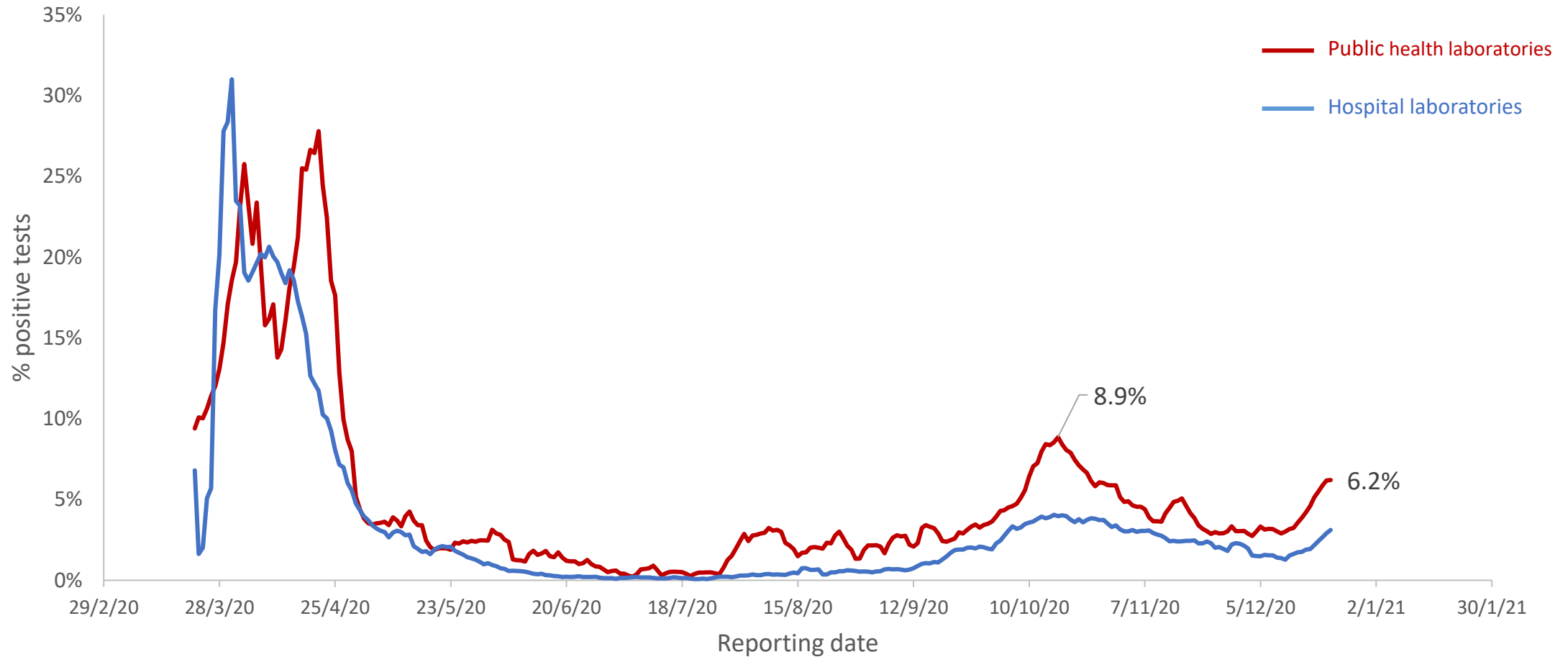
14-day cumulative incidence by date of confirmation. Tests outsourced to German laboratory in April backdated, using the specimen collection date, to the date they would have been confirmed if tested in a timely manner. The vertical dashed lines indicate the dates of escalation and de-escalation of public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



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Test positivity: public health laboratories

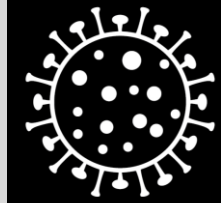
The positivity rate is higher for tests conducted in public health laboratories (NVRL, associated laboratories and Cherry Orchard) compared with tests conducted in hospitals. Positivity rates in public health laboratories are increasing rapidly (from 3% to 6% in one week)



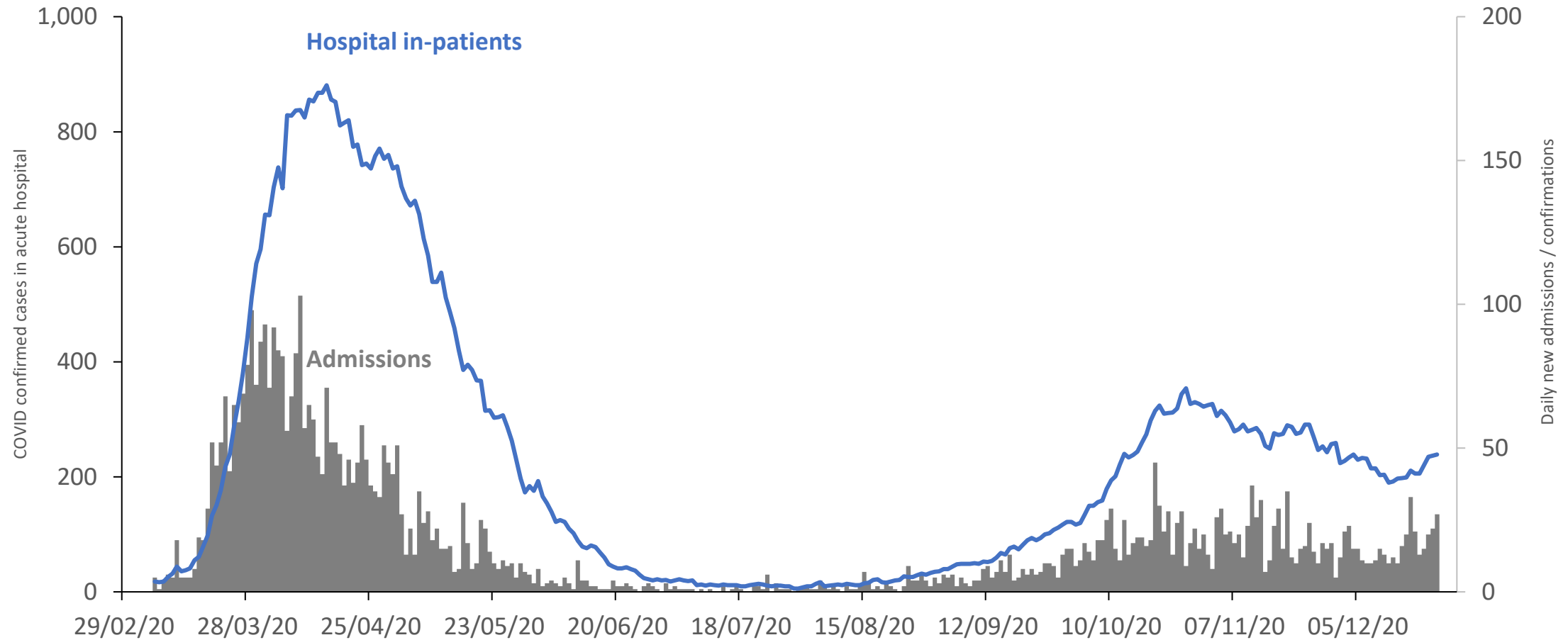
Data 5-day rolling averages of percentage of tests reported positive per day. NVRL+ is NVRL and associated laboratories, plus Cherry Orchard. Backlog tests outsourced to German laboratory in April are not backdated and are assigned to date reported

Confirmed cases in acute hospitals

The number of people in hospital with confirmed SARS-CoV-2 infection is now increasing



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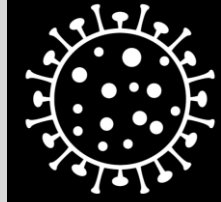
Hospital in-patients: Daily count of number of COVID-19 confirmed cases in acute hospitals. Daily admissions: New COVID-19 confirmed admissions and new laboratory confirmations of suspected cases in preceding 24 hours. Data from HSE PMIU-SDU, 8am census.



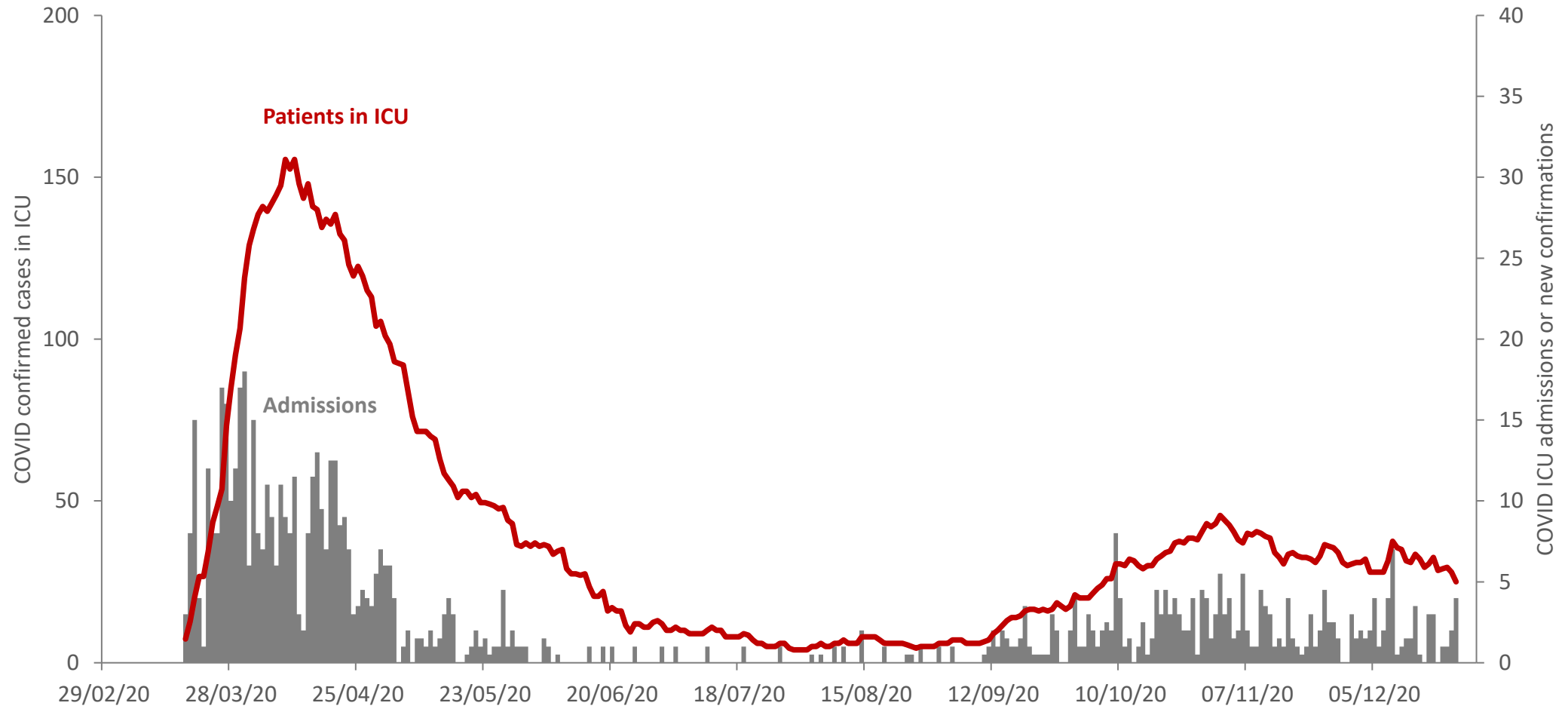
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Confirmed cases in intensive care

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



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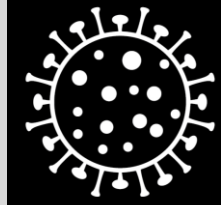


Patients in ICU: Daily count of number of COVID-19 confirmed cases in ICU. Daily admissions: new COVID-19 confirmed admissions to ICU and new laboratory confirmations of suspected cases in ICU. Average of morning and evening census from NOCA

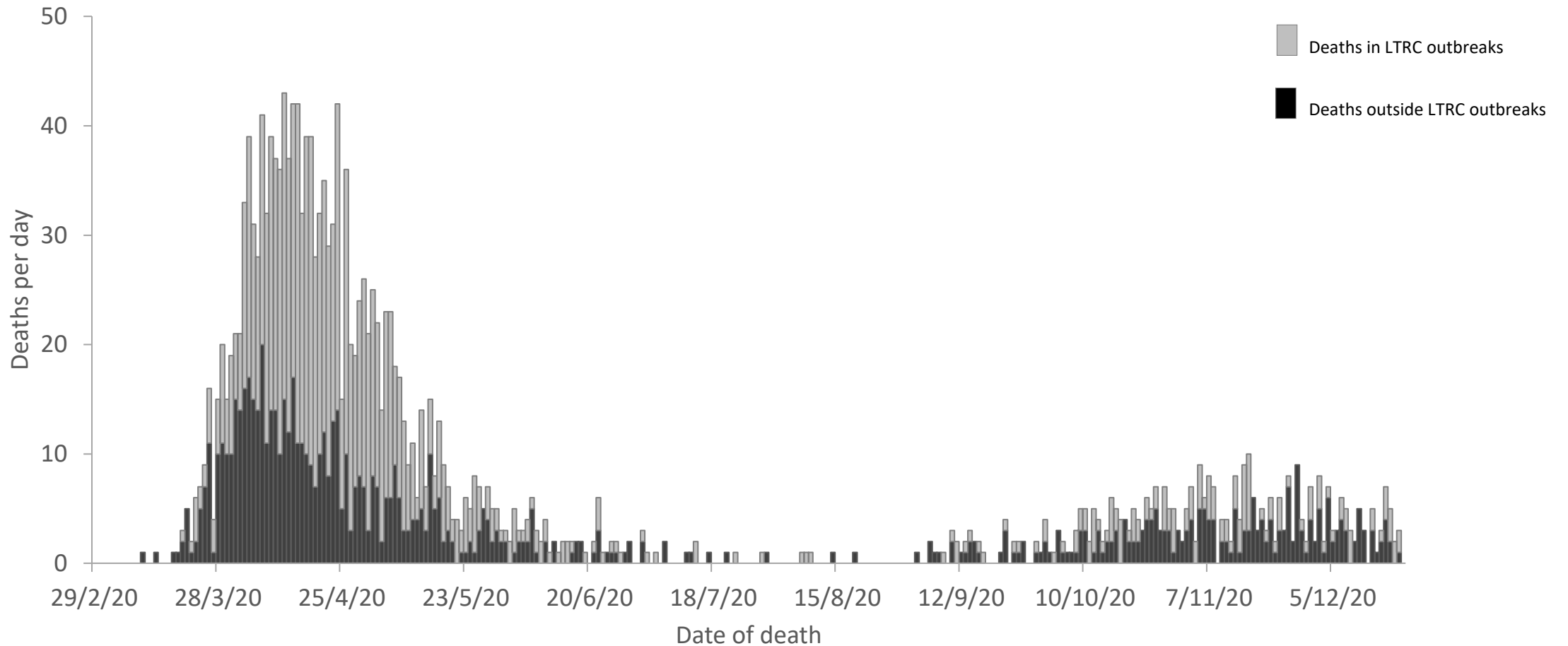


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Deaths per day



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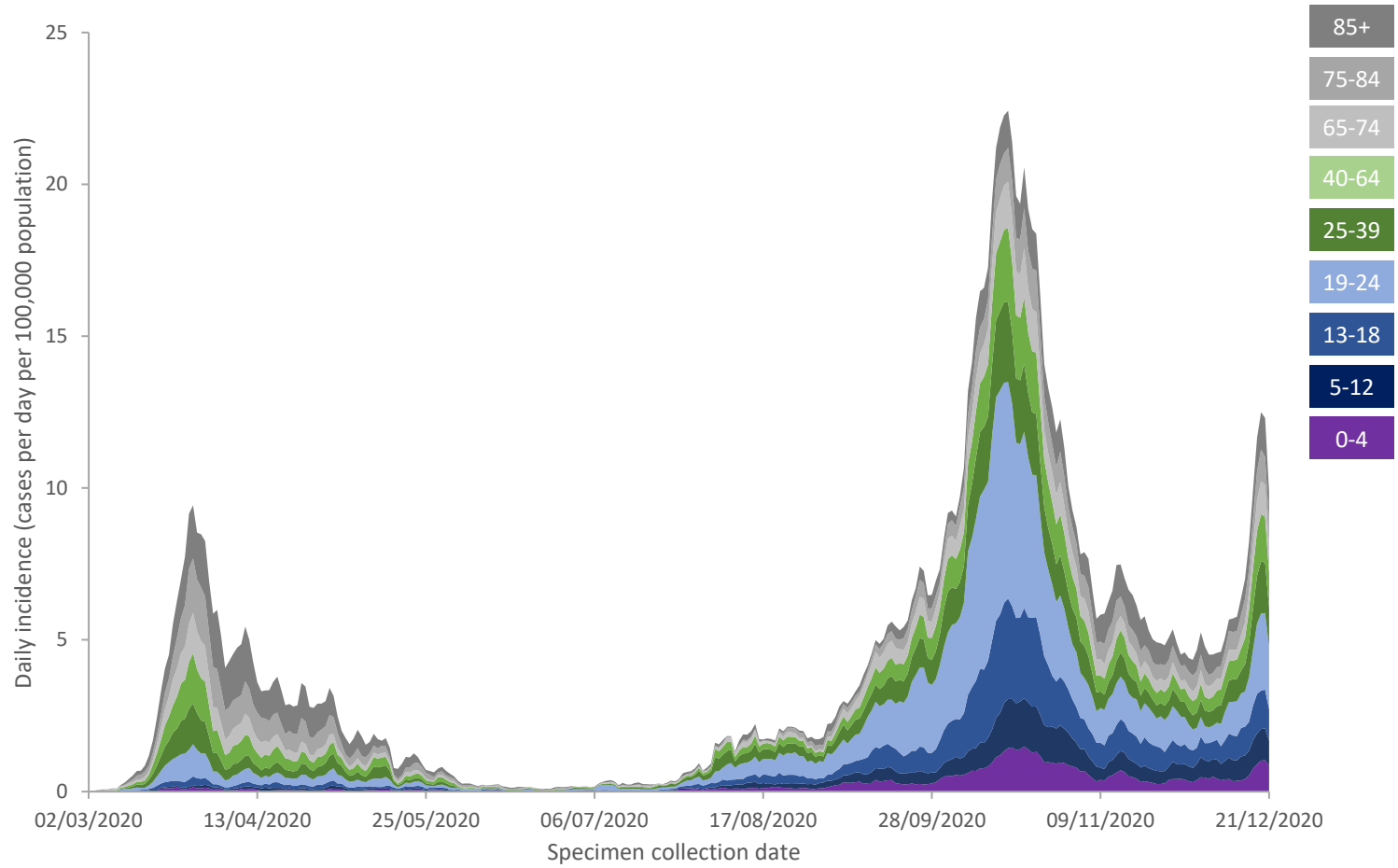
Deaths per day, separated into those associated with outbreaks in long-term residential care and those not associated with such outbreaks. Deaths with laboratory confirmed SARS-CoV-2 only



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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. The current increase in levels of infection is different, with rising incidence across all age groups, and a concerning increase in those aged 65 and older



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	31.1	25.4	24.9	28.1
13	6.9	4.2	14.5	58.0	73.3	86.5	72.3	88.5	84.4
14	4.5	4.4	6.7	28.1	40.1	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	28.9	50.9	69.6
17	3.3	4.2	7.8	21.1	23.7	26.5	21.2	50.4	60.7
18	4.5	6.4	9.4	20.2	25.9	21.0	18.7	37.7	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	10.9	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	34.4	15.3	10.5	5.6	5.1	1.5
35	6.0	9.5	13.2	36.2	17.9	10.7	4.8	8.7	5.9
36	13.3	13.7	17.8	48.6	22.6	13.9	11.0	12.2	14.8
37	17.5	17.5	29.9	64.3	28.3	24.5	22.5	8.7	7.4
38	21.4	26.2	44.1	90.3	44.3	34.8	32.9	19.8	14.8
39	12.4	22.8	42.8	148.2	50.1	42.0	33.2	31.0	17.8
40	29.9	28.6	63.2	167.3	67.8	57.7	34.3	26.0	19.2
41	44.0	47.4	134.8	322.2	116.6	91.6	62.1	51.9	53.3
42	78.1	90.9	196.7	430.8	155.2	142.9	91.8	67.7	57.7
43	82.7	93.5	176.0	305.5	122.7	121.7	84.6	82.9	69.6
44	54.0	67.1	93.9	153.1	74.3	76.2	54.3	54.5	45.9
45	34.4	39.7	58.1	83.9	58.0	46.1	42.8	44.3	41.4
46	41.9	37.2	65.9	90.0	45.5	45.2	32.7	43.3	57.7
47	22.0	34.1	59.5	79.7	34.8	33.2	28.6	39.2	54.8
48	23.2	31.5	45.5	66.7	33.9	29.9	22.2	36.1	31.1
49	28.4	36.6	37.7	40.5	33.2	30.1	25.4	30.0	34.0
50	21.1	39.7	44.1	57.4	40.1	35.3	22.5	31.6	19.2
51	51.0	57.6	71.6	127.1	87.0	81.7	54.6	55.5	56.3

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.

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. The current increase in levels of infection is different, with rising incidence across all age groups, and a concerning increase in those aged 65 and older

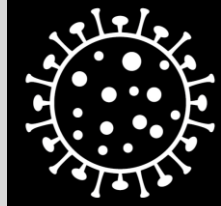


Week	Age band								
	0-4	5-12	13-18	19-24	25-39	40-64	65-74	75-84	85+
26	0.6	0.2	0.3	1.8	1.5	0.7	0.8	1.5	3.0
27	1.5	0.4	0.3	1.8	1.9	0.9	0.0	1.0	0.0
28	0.9	1.1	1.1	10.9	2.0	1.1	1.9	1.0	3.0
29	1.2	0.4	0.8	3.0	3.3	1.9	2.4	1.5	3.0
30	1.8	0.5	1.6	3.6	4.3	0.9	1.9	0.0	1.5
31	4.8	2.6	7.3	11.2	8.6	4.6	2.1	2.5	1.5
32	4.5	3.8	6.7	19.9	16.7	10.9	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	34.4	15.3	10.5	5.6	5.1	1.5
35	6.0	9.5	13.2	36.2	17.9	10.7	4.8	8.7	5.9
36	13.3	13.7	17.8	48.6	22.6	13.9	11.0	12.2	14.8
37	17.5	17.5	29.9	64.3	28.3	24.5	22.5	8.7	7.4
38	21.4	26.2	44.1	90.3	44.3	34.8	32.9	19.8	14.8
39	12.4	22.8	42.8	148.2	50.1	42.0	33.2	31.0	17.8
40	29.9	28.6	63.2	167.3	67.8	57.7	34.3	26.0	19.2
41	44.0	47.4	134.8	322.2	116.6	91.6	62.1	51.9	53.3
42	78.1	90.9	196.7	430.8	155.2	142.9	91.8	67.7	57.7
43	82.7	93.5	176.0	305.5	122.7	121.7	84.6	82.9	69.6
44	54.0	67.1	93.9	153.1	74.3	76.2	54.3	54.5	45.9
45	34.4	39.7	58.1	83.9	58.0	46.1	42.8	44.3	41.4
46	41.9	37.2	65.9	90.0	45.5	45.2	32.7	43.3	57.7
47	22.0	34.1	59.5	79.7	34.8	33.2	28.6	39.2	54.8
48	23.2	31.5	45.5	66.7	33.9	29.9	22.2	36.1	31.1
49	28.4	36.6	37.7	40.5	33.2	30.1	25.4	30.0	34.0
50	21.1	39.7	44.1	57.4	40.1	35.3	22.5	31.6	19.2
51	51.0	57.6	71.6	127.1	87.0	81.7	54.6	55.5	56.3

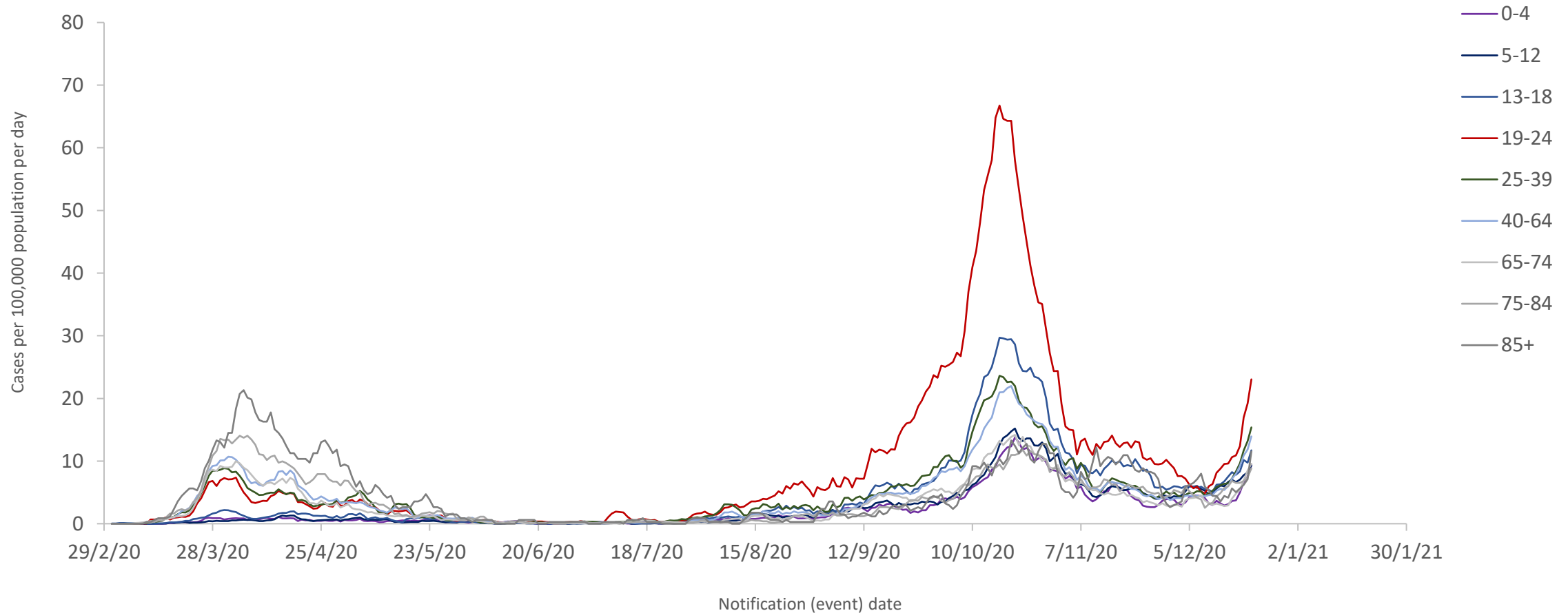
Heat map shows age-specific incidence (cases per week per 100,000 population) Healthcare workers and cases associated with outbreaks in long-term residential care are excluded, so that the analysis reflects the pattern of cases in the community. Cases dated by date of specimen collection.

Incidence by age group (excl. HCW and LTRC)

The incidence per 100,000 population is shown for different age cohorts. The second wave in September-October had three components. Incidence rose early in the 19-24 age group; then, after a delay of several weeks, incidence rose in those aged 12-18 and 25-60; after a further delay, incidence rose in those under 12 and 65 and older. Older adults were protected until very late in the wave. However, incidence is now rising rapidly across all age groups.



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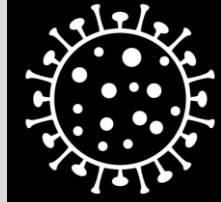
Age-specific incidence (cases per day per 100,000 population within each age cohort, population from CSO 2016 census data). Healthcare workers and cases associated with outbreaks in long-term residential care are excluded, so that the analysis reflects the pattern of cases in the community. Cases dated by notification (event) date. Tests outsourced to German laboratory in April backdated, using the specimen collection date, to the date they would have been confirmed in a timely manner.



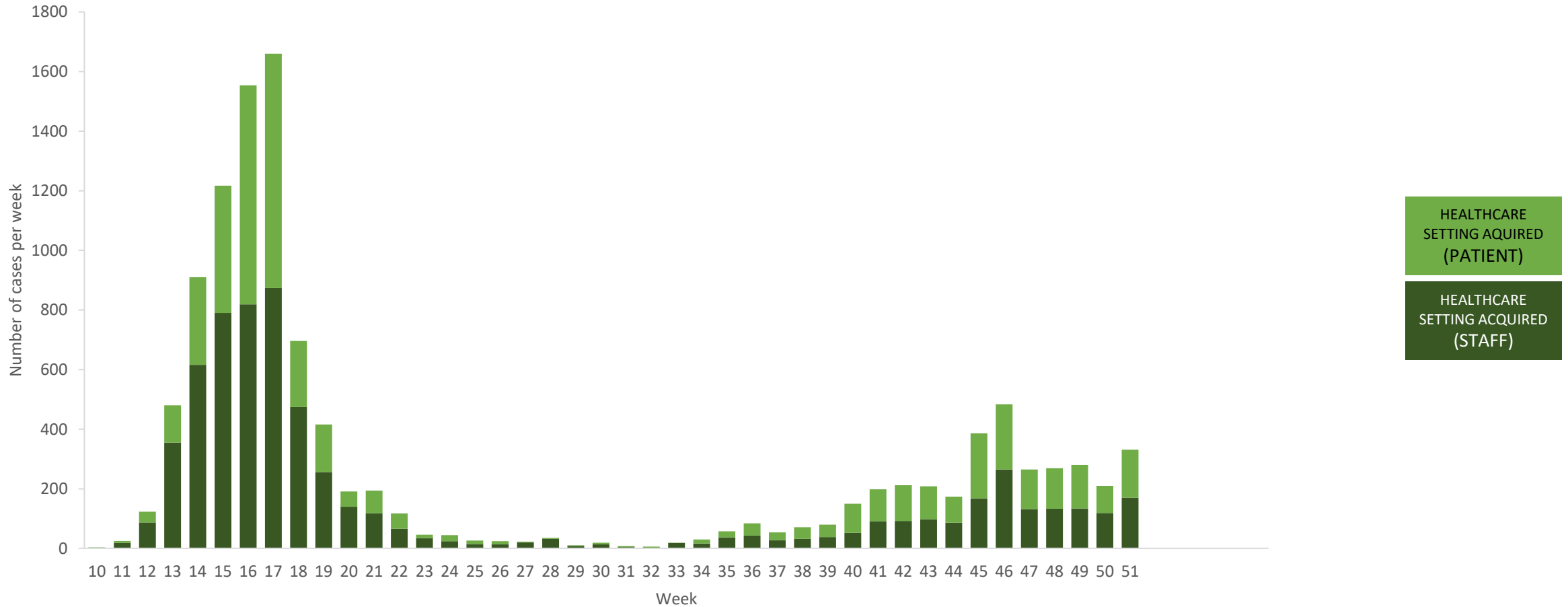
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Infections in the healthcare setting

The number of healthcare-setting-acquired infections had decreased from the peak in October, but increased again in week 51



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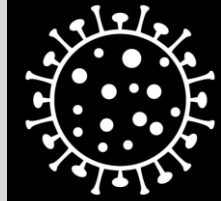
Weekly total number of cases recorded in CIDR as 'healthcare setting acquired' Cases dated by date of specimen collection



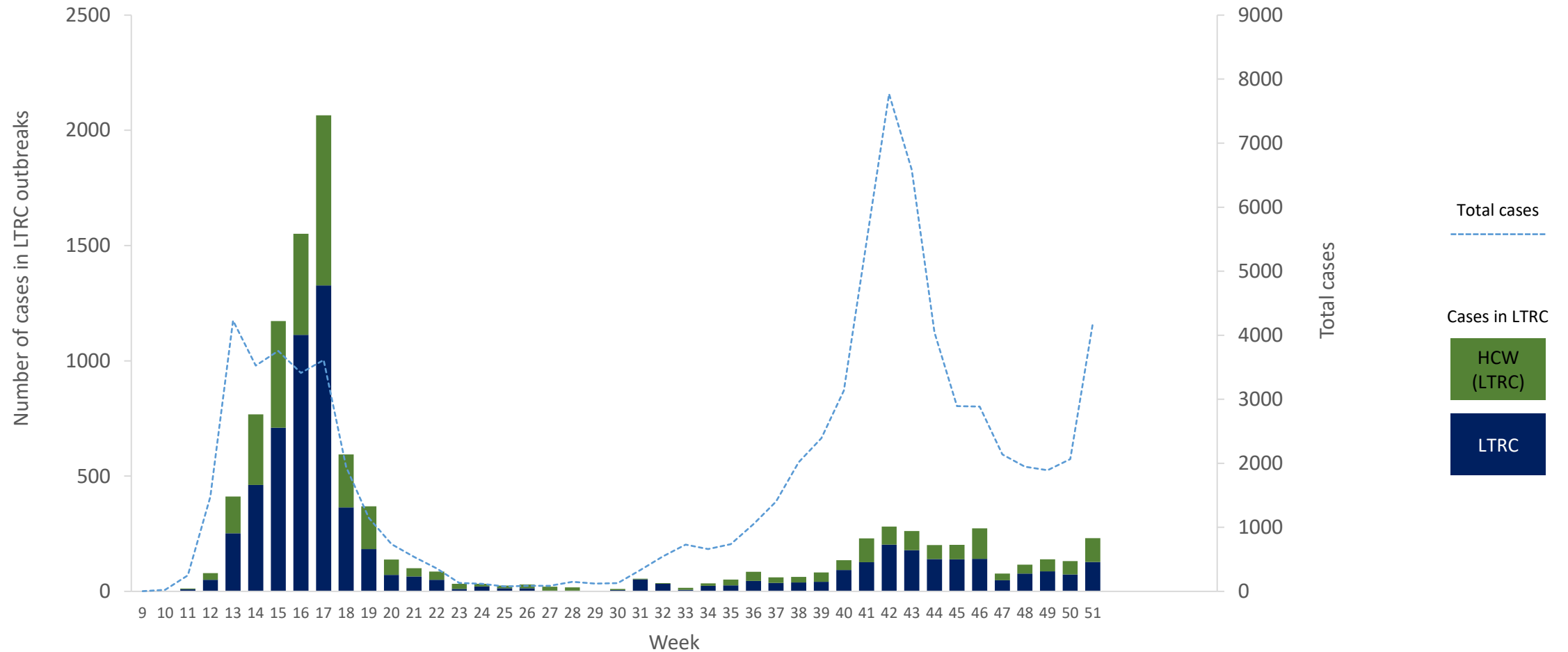
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Cases in long-term residential settings

The number of cases in LTRC was less in the second wave compared to the first; nonetheless, the very high levels of infection in the wider community led to 200-300 cases per week associated with outbreaks in LTRC in weeks 41-46. The incidence was lower in subsequent weeks, but has risen again in week 51



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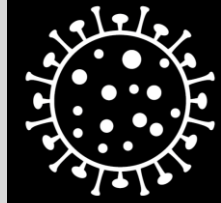
Weekly cases by setting. LTRC: cases amongst residents of long-term residential settings where outbreaks have occurred. HCW (LTRC): Cases in healthcare workers associated with outbreaks in LTRC. The dashed blue line shows the total number of newly confirmed cases each week, referred to the secondary y-axis



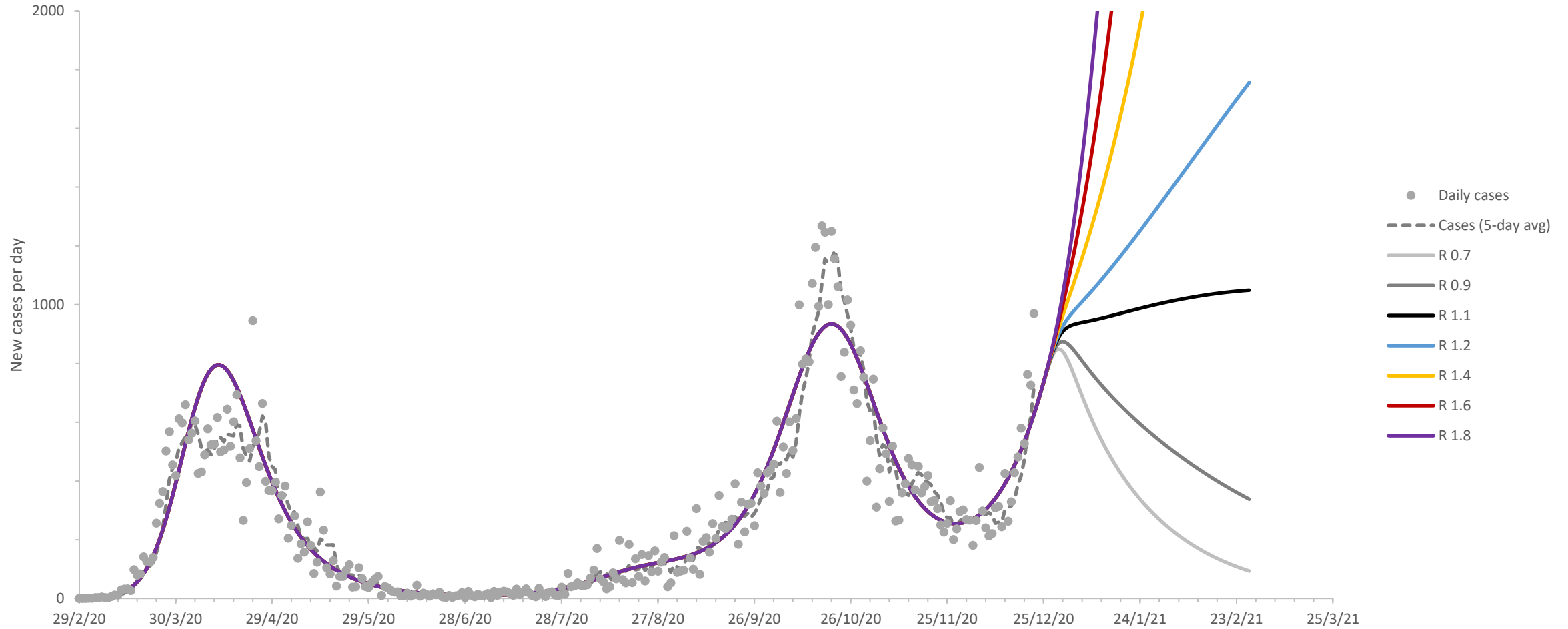
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What do our models tell us?

Model calibrated to case data until *22 December 2020*, R varies over a wide range thereafter



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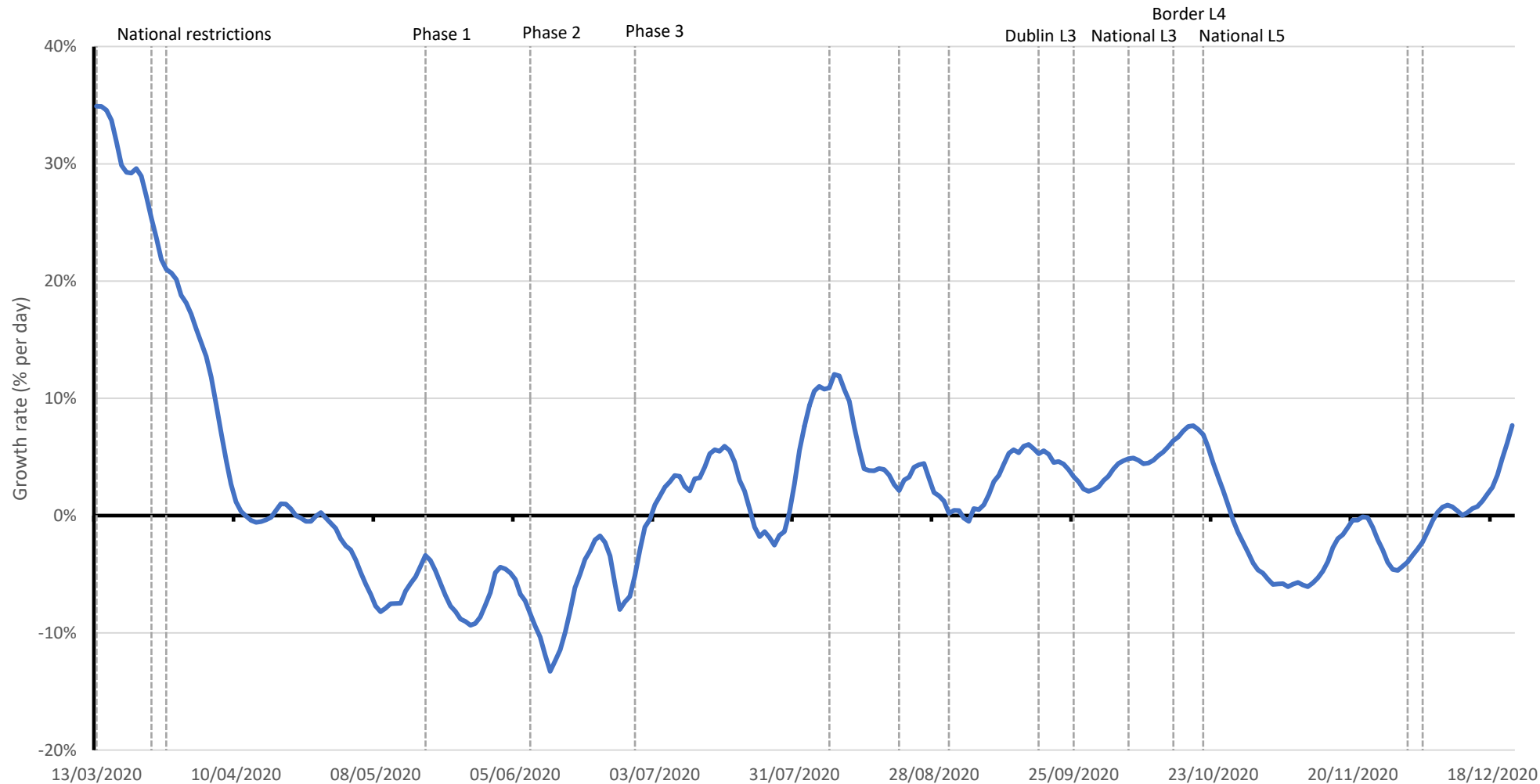
Model projections of the number of new cases per day. The model is calibrated with daily case counts to 22 December 2020; R varies between 0.7 and 1.8 thereafter. This is a scenario model only. It is not a forecast, nor does it imply or anticipate any future policy decision.



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Growth rate for case numbers

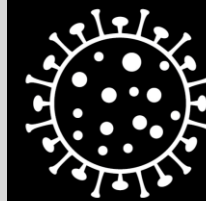
When the pandemic in Ireland grew very rapidly in early March, at over 30% per day. The national restrictions introduced in late March suppressed transmission, with daily incidence decreasing at -5% to -10% per day. This was sustained until the end of June, after which case numbers started to grow, on average at 4% to 5% per day. A period of very rapid growth can be seen in early August associated with the outbreaks in Kildare-Laois-Offaly. Level 3 measures in Dublin reduced growth rate to zero for a period (data not shown). Incidence decreased at -5% to -7% per day for the first three weeks of Level 5 measures, at a slower rate thereafter, and is now increasing by 7% - 9% per day



Growth rate calculated as the average growth rate over a 14-day trailing window; cases dated by notification (event) date.

Estimates of effective reproduction number (R)

Reproduction number is high, currently estimated at 1.5 to 1.8.



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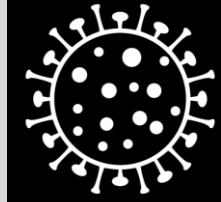
Method	Estimate	95% confidence interval
SEIR model-inferred	1.60	1.37 – 1.90
Bayesian model	1.89	1.14 – 2.98
Time-dependent R	1.66	1.53 – 1.80
GAM estimate 14 Dec 2020	1.35	1.11 – 1.59
GAM estimate 21 Dec 2020	1.59	1.20 – 1.99

Estimates generated 22 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.



Rialtas na hÉireann
Government of Ireland

Situation analysis 23 December 2020



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- The level of infection now **increasing rapidly**
 - Cases (5-day average) **785 cases per day**; 14-day incidence **153 per 100,000**
 - Incidence rising across **all age groups**
 - **Growth rate** estimated to be **at least 7- 9% per day**, and **doubling time 8-10 days or less**
 - note that 5-day average case count has doubled from 330 cases per day to 785 cases per day **in 7 days**, suggesting growth rate is increasing
 - **Reproduction number** very high – **1.5 – 1.8**
 - Growth rates similar to or greater than those seen approaching the peak of the second wave
- **Numbers in hospital increasing**, numbers in intensive care and deaths per day static
- We are now **in a surge** with older and vulnerable adults a key concern
- Public health measures will reduce reproduction number
 - R=1.4: average 1100 cases per day by 4 Jan; 1600 cases per day by 18 Jan
 - R=1.1: average 1000 cases per day by 4 Jan; 1200 cases per day by 18 Jan
- A significant number of cases and hospitalisations over coming weeks
- **Stay home if possible**
 - revise Christmas plans to limit numbers and duration, hand hygiene, distance, masks, ventilation
 - self-isolate and seek referral for test immediately if symptomatic
 - carefully observe public health guidance and restrictions