IEMAG briefing

29 December 2020

Coronavirus COVID-19 Public Health Advice

Confirmed cases each day

Daily case count since the beginning of the epidemic

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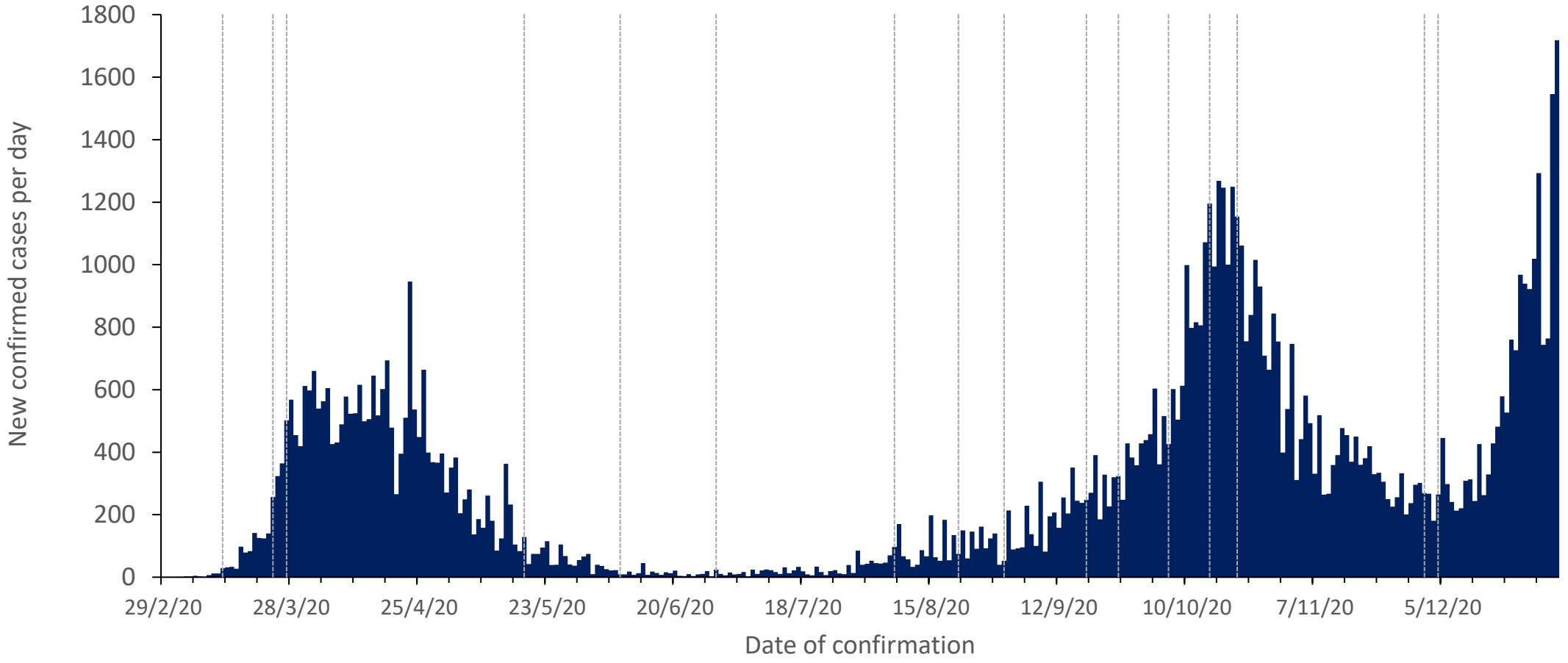

Daily count of the number of laboratory confirmed new cases by date on which they were confirmed by HPSC. Tests outsourced to German laboratory in April backdated, using the specimen collection date, to the date they would have been confirmed if tested in a timely manner. The vertical dashed lines indicate 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 rapildy. The number of people in hospital and the number of admissions per day is increasing sharply
The number in ICU has increased in recent days, but this is not yet reflected in the 7-day average. The number of deaths per day is increasing.

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	16 Apr	24 Jun	29 Jul	26 Aug	30 Sept	21 Oct	9 Dec	16 Dec	23 Dec	31 Dec	Daily count 31 Dec
Cases confirmed per day	547	10	18	117	356	1160	268	330	713	1243	
14-day incidence *per 100,000 population*	157	4.0	5.6	32	92	288	79	88	153	297	
Hospital in-patients	858	42	11	22	108	279	228	198	222	365	491
Hospital admissions per day	*56*	*2*	*2*	*3*	*10*	*23*	*14*	*14*	*22*	*43*	*61*
ICU confirmed cases	147	15	5	6	18	32	31	33	29	31	42
ICU admissions per day	*8*	*< 1*	*< 1*	*< 1*	*2*	*3*	*3*	*1*	*2*	*5*	*8*
Deaths confirmed per day	32	< 1	< 1	< 1	1	5	4	5	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 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	1 Dec	8 Dec	15 Dec	22 Dec	29 Dec
Tests done per day	5579	2607	6494	7742	12624	16030	10663	11003	11870	14483	14814
% tests positive	18%	0.5%	0.4%	1.7%	3.0%	7.1%	2.7%	2.5%	2.8%	5.1%	10.9%

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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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 have increased rapidly, and now exceed the positivity rate at the peak of the second wave.

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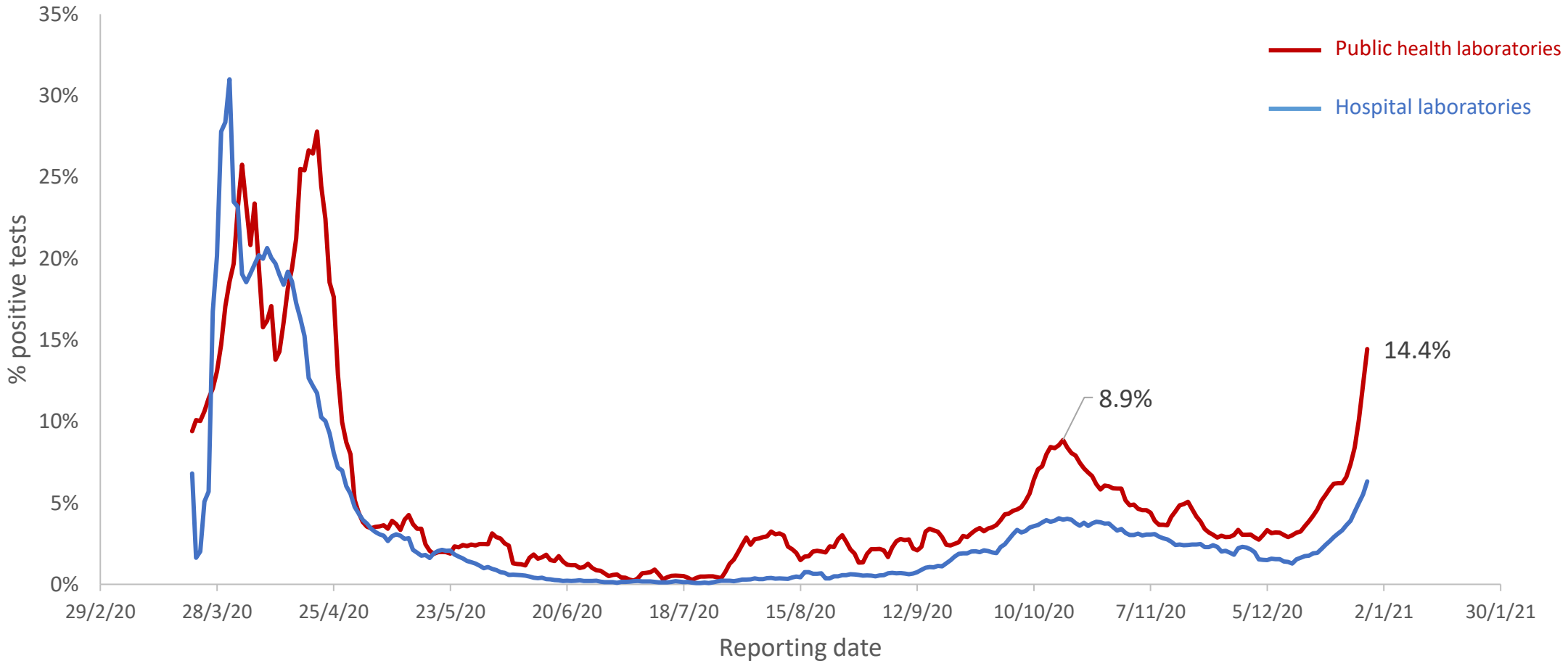

Data 5-day rolling averages of percentage of tests reported positive per day. NVRL+ is NVRL and associated laboratories, plus Cherry Orchard
Backlog tests outsourced to German laboratory in April are not backdated and are assigned to date reported

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Confirmed cases 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 1279

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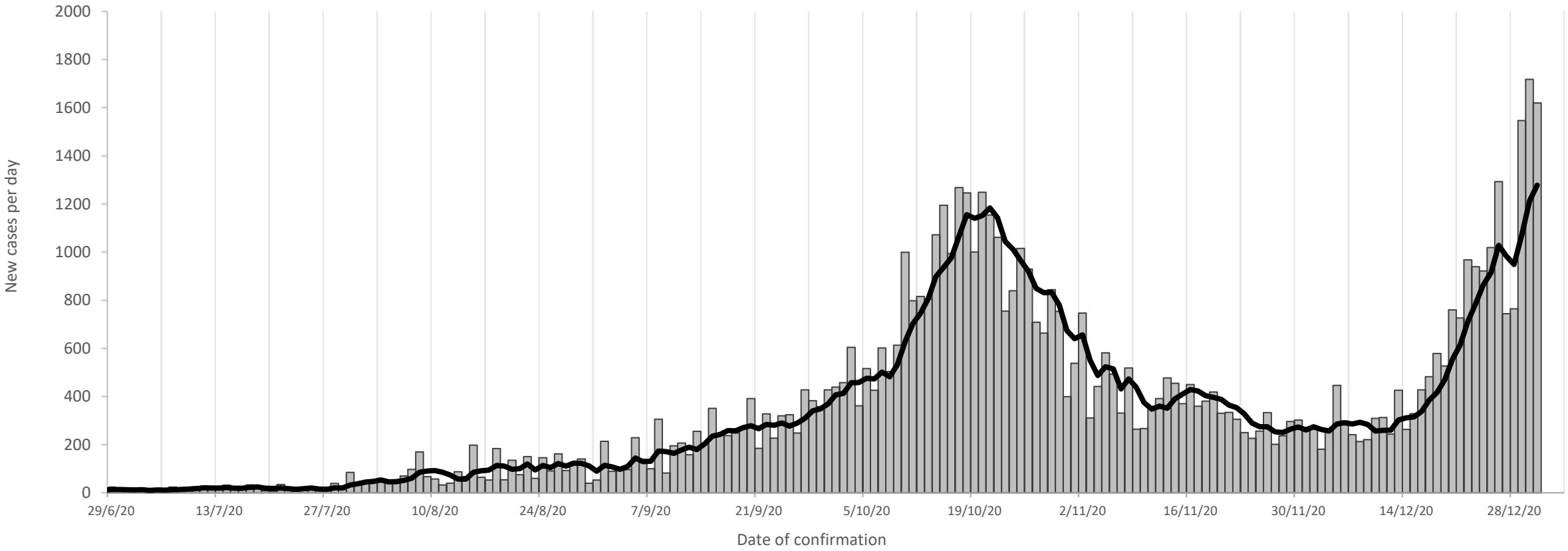
Cases per week	93	125	139	119	284	540	546	711	796	912	1303	1947	2060	3031	4458	7397	7073	4838	3424	2583	2580	1799	2028	1967	3368	6611



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.

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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, reached a low of 78 per 100,000 on 4 December, and is now 297 per 100,000

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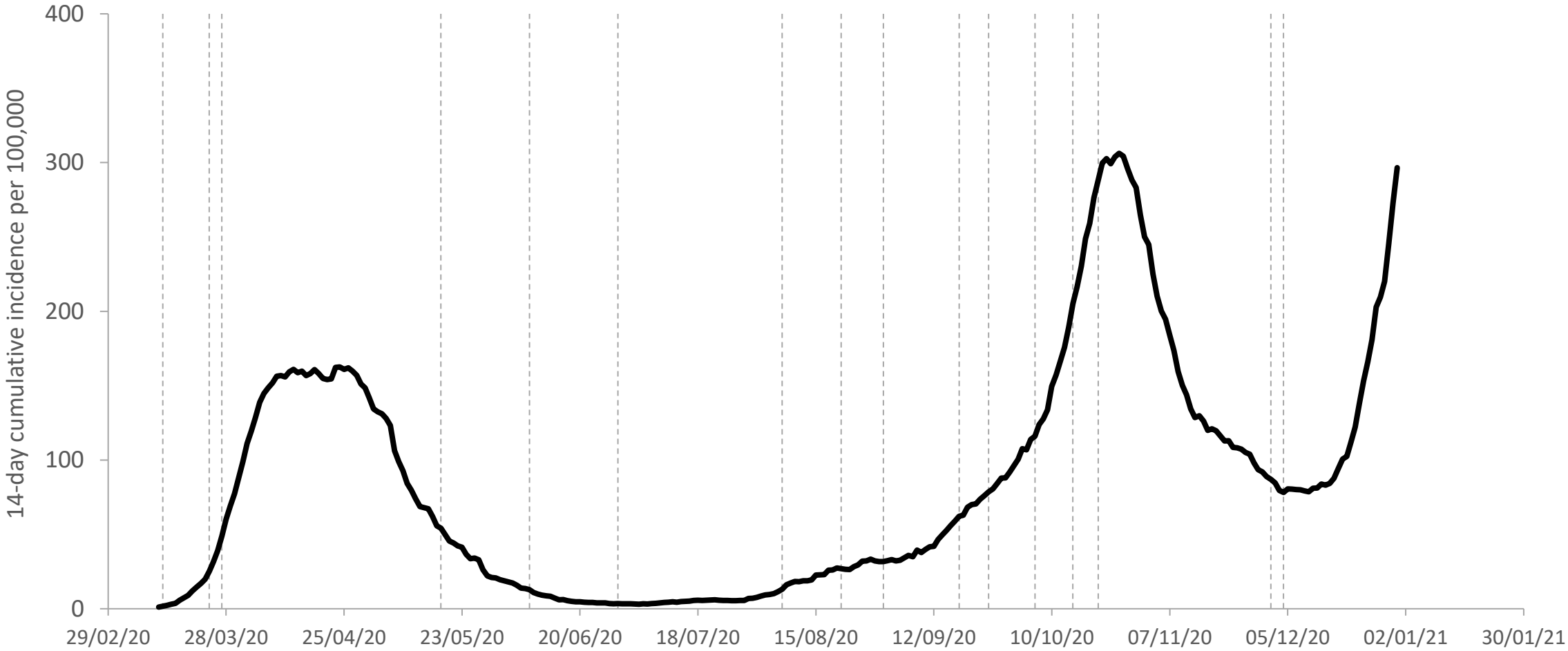

14-day cumulative incidence by date of confirmation. Tests outsourced to German laboratory in April backdated, using the specimen collection date, to the date they would have been confirmed if tested in a timely manner. The vertical dashed lines indicate the dates of escalation and de-escalation of public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

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A large number of positive tests in recent days

Positive tests detected in laboratories require validation (to remove duplicates and other tests that do not create new cases) and transfer to the HPSC database before confirmation and reporting. A very large volume of positive tests in recent days means there is a delay in formal reporting, so that approximately 4000 additional new cases will be reported over the coming days. The reporting delay does not affect case management or contact tracing, or our overall monitoring and modelling of the pandemic.

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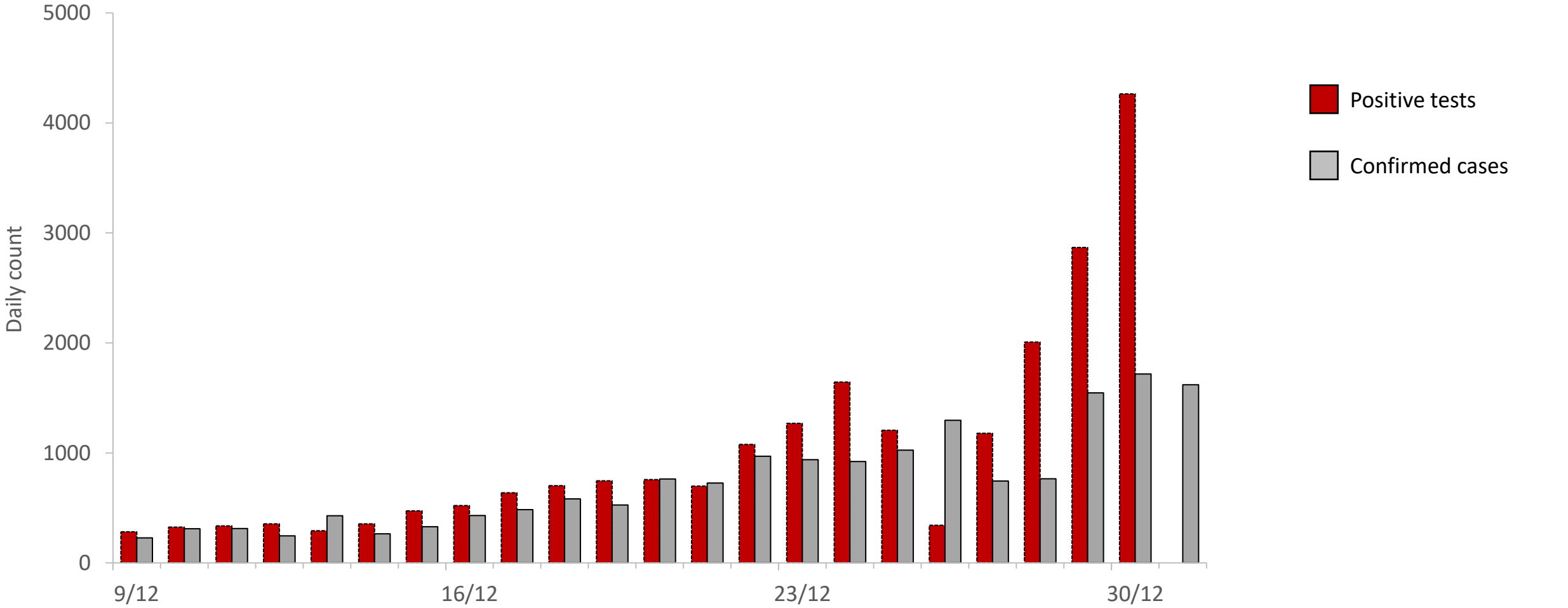

Positive tests: Total positive tests reported to HSE from all laboratories each day.
Confirmed cases: Cases confirmed by HPSC on each day .

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Confirmed cases in acute hospitals

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

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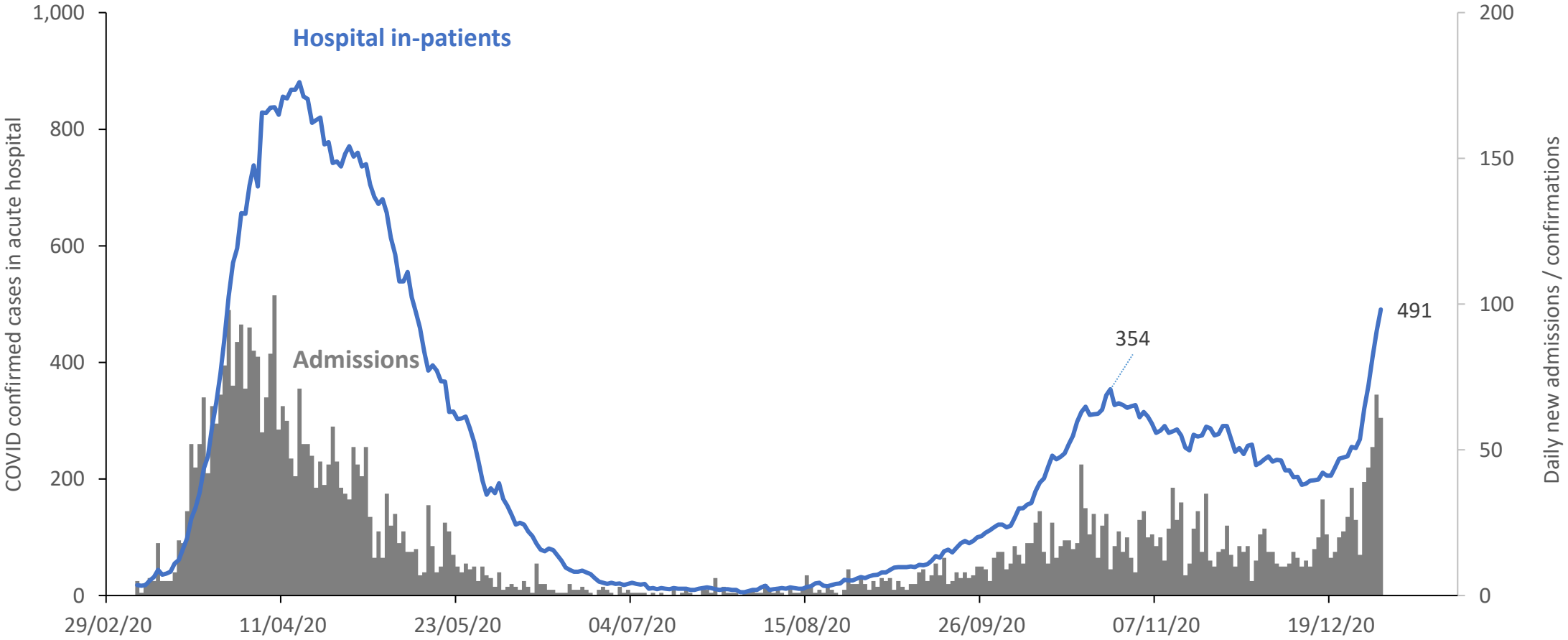

Hospital in-patients: Daily count of number of COVID-19 confirmed cases in acute hospitals. Daily admissions: New COVID-19 confirmed admissions and new laboratory confirmations of suspected cases in preceding 24 hours. Data from HSE PMIU-SDU, 8am census.

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Confirmed cases in intensive care

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

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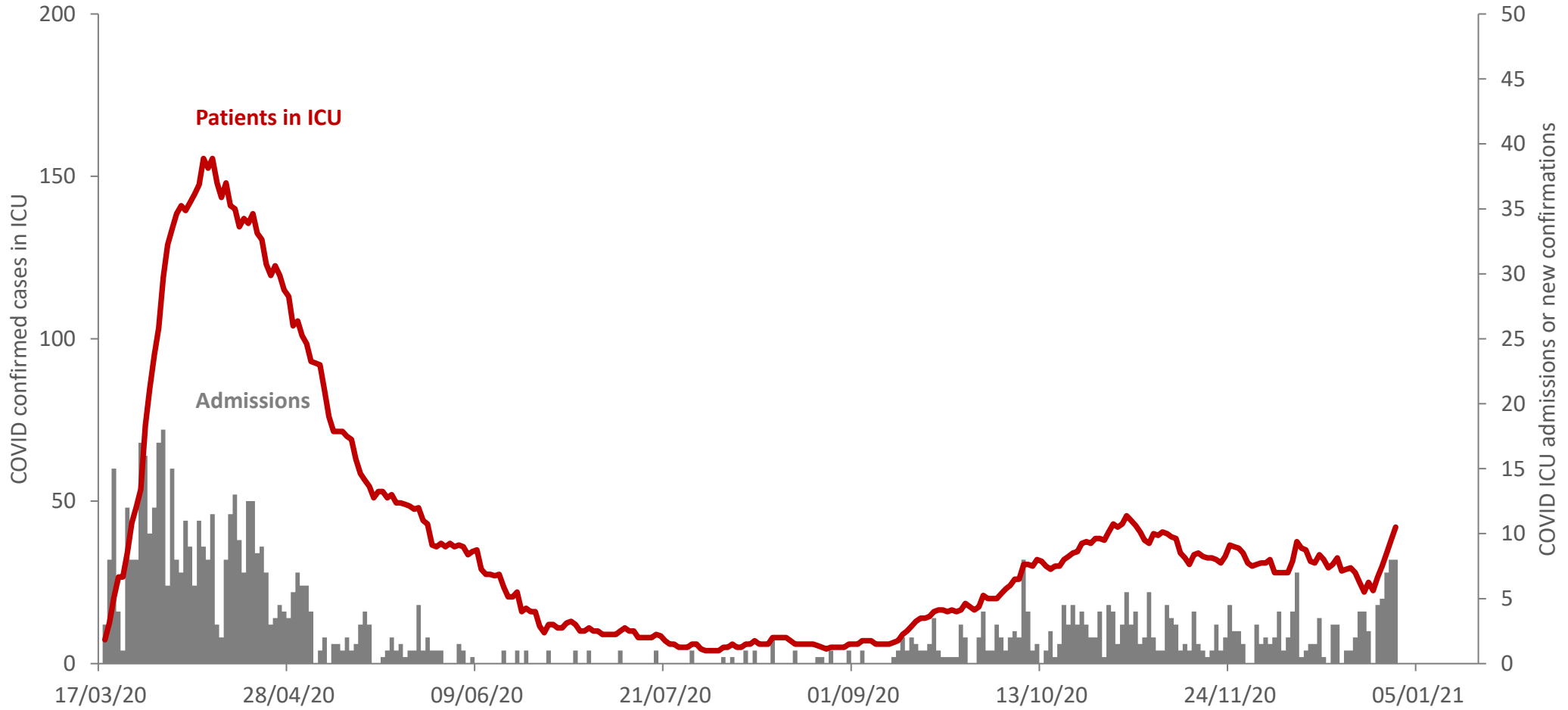

Patients in ICU: Daily count of number of COVID-19 confirmed cases in ICU. Daily admissions: new COVID-19 confirmed admissions to ICU and new laboratory confirmations of suspected cases in ICU. Average of morning and evening census from NOCA

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Cases, numbers in hospital and intensive care

There was a long delay in the second wave between the increase in cases and the increase in the numbers of people in hospital because there was a long period in September and October where the disease was largely confined to younger adults. However, numbers in hospital are now rising sharply, as the recent rapid increase in incidence was more evenly distributed across age cohorts

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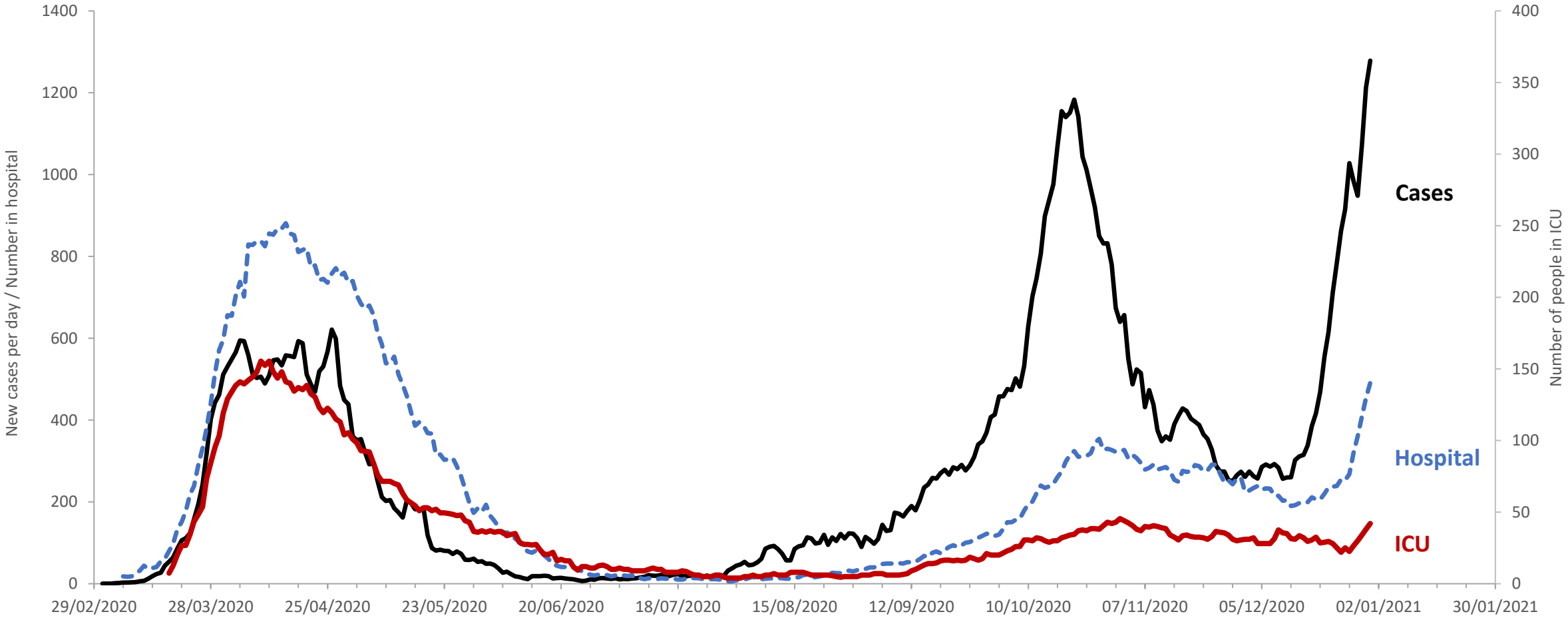

Cases: Number of new cases confirmed per day, cases assigned to date confirmed by HPSC. Tests outsourced to German laboratory in April backdated, using the specimen collection date, to the date they would have been confirmed if tested in a timely manner. Hospital: number of COVID-19 confirmed patients in acute hospitals. ICU: number of COVID-19 confirmed patients in ICU. 5-day averages.

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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. . There has been a very marked increase in incidence in the last week in those aged 19-24. A number of cases in those aged 65 and older will be linked in the coming days to outbreaks in LTRC.

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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	155.1	142.8	91.8	67.7	57.7
43	82.7	93.5	175.5	304.9	122.7	121.6	84.6	82.9	69.6
44	54.0	67.1	93.9	152.8	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	89.7	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	21.4	39.7	44.4	57.4	40.1	35.3	22.5	31.6	19.2
51	51.6	58.5	74.3	128.9	88.9	82.2	54.9	56.0	48.8
52	72.4	73.4	114.1	313.4	175.2	136.4	90.8	99.7	124.3

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.

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Incidence by age group (excl. HCW and LTRC)

This analysis compares incidence in young adults (aged 19-24 and 25-39) with the population average and the incidence in those aged 65 and older. While in the second wave there is a delay of several weeks between increasing incidence in young people and an attenuated increase in older persons, in the third wave incidence is rising early and rapidly in those aged 65 and older

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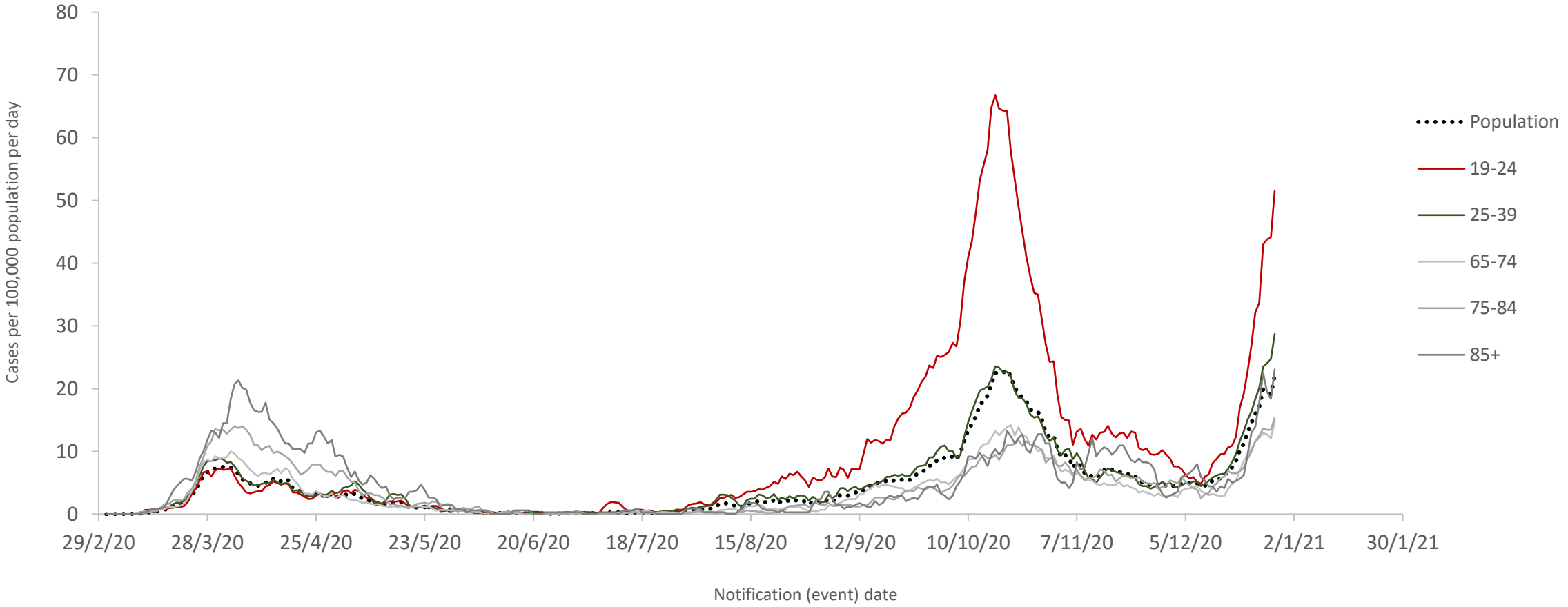

Age-specific incidence (cases per day per 100,000 population within each age cohort, population from CSO 2016 census data). Healthcare workers and cases associated with outbreaks in long-term residential care are excluded, so that the analysis reflects the pattern of cases in the community. Cases dated 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 if tested in a timely manner.

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Incidence by age

Age-specific incidence for those aged under 25, compared with the overall population. The incidence in those aged 18 and under remains below the population average

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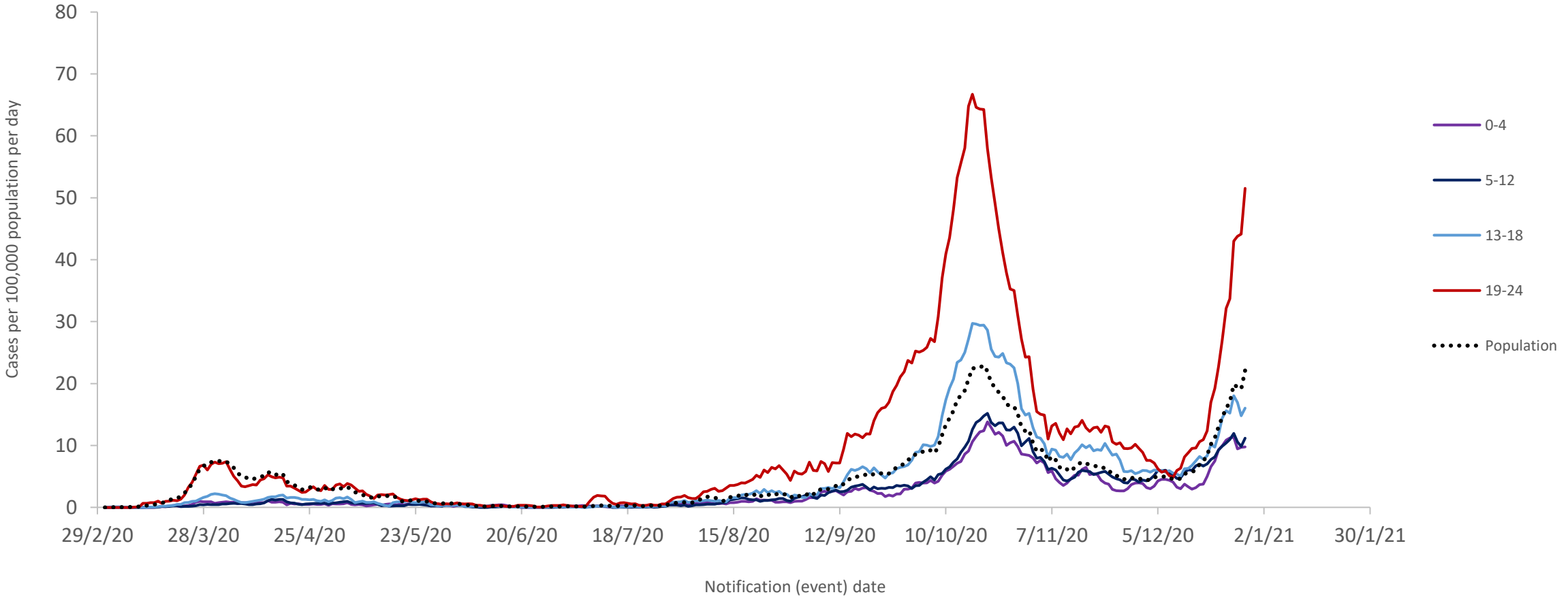

Age-specific incidence (cases per day per 100,000 population within each age cohort, population from CSO 2016 census data). Healthcare workers and cases associated with outbreaks in long-term residential care are excluded, so that the analysis reflects the pattern of cases in the community. Cases dated 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 if tested in a timely manner.

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Estimates of effective reproduction number (R)

Reproduction number is high, currently estimated at 1.6 to 1.8.

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Method	Estimate	95% confidence interval
SEIR model-inferred	1.98	1.65 – 2.43
Bayesian model	1.65	1.02 – 2.65
Time-dependent R	1.77	1.59 – 1.95
GAM estimate 21 Dec 2020	1.43	1.18 – 1.68
GAM estimate 28 Dec 2020	1.62	1.23 – 2.01

Estimates generated 29 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 ***29 December 2020*** , R varies over a wide range thereafter

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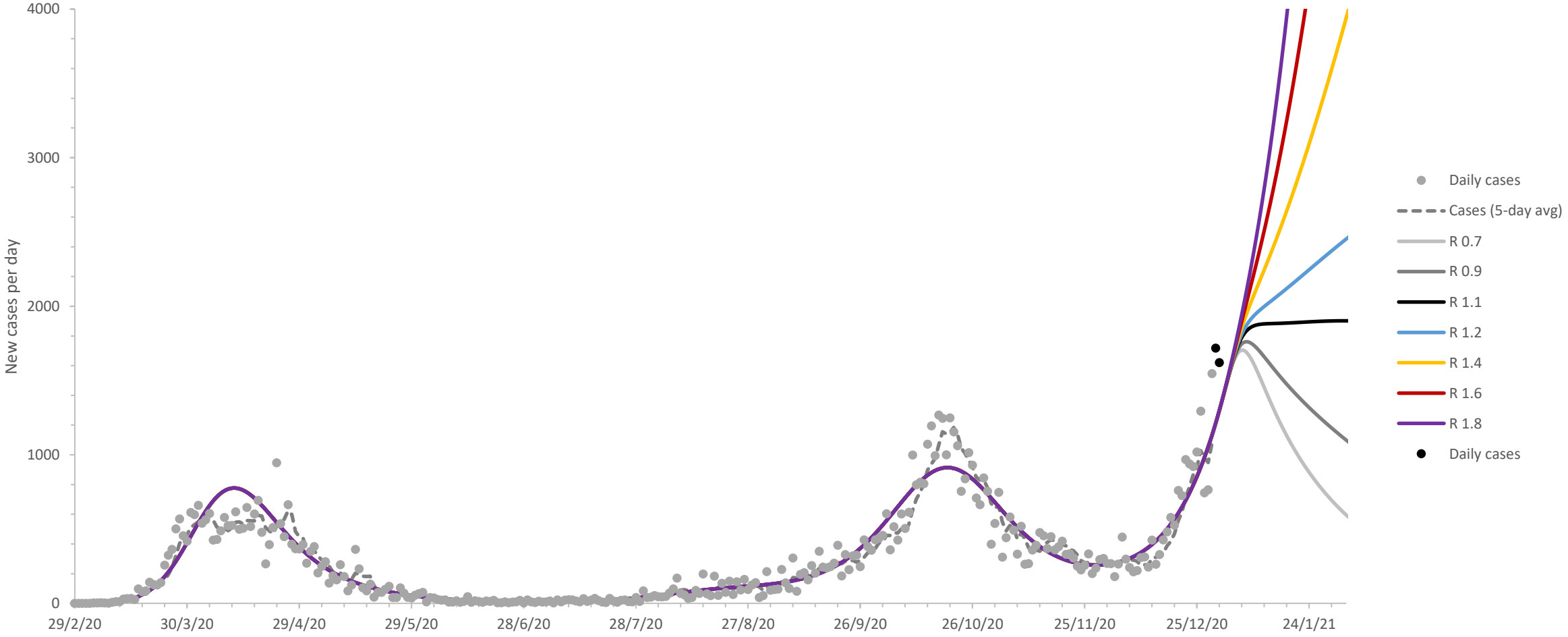

Model projections of the number of new cases per day. The model is calibrated with daily case counts to 29 December 2020 (grey); R varies between 0.7 and 1.8 thereafter. Case counts from 30 December onwards are shown in black. This is a scenario model only. It is not a forecast, nor does it imply or anticipate any future policy decision.

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Model projections of hospital in-patient numbers

Model outputs for numbers of people in hospital with COVID-19. Model calibrated to 29 December 2020, and R then varies between 0.9 and 1.4. This model shows that even with suppression at R = 0.9 from 30 December, numbers in hospital will peak at over 700. If we fail to suppress transmission, numbers in hospital will exceed 800 early in January 2021, and rise thereafter depending on reproduction number.

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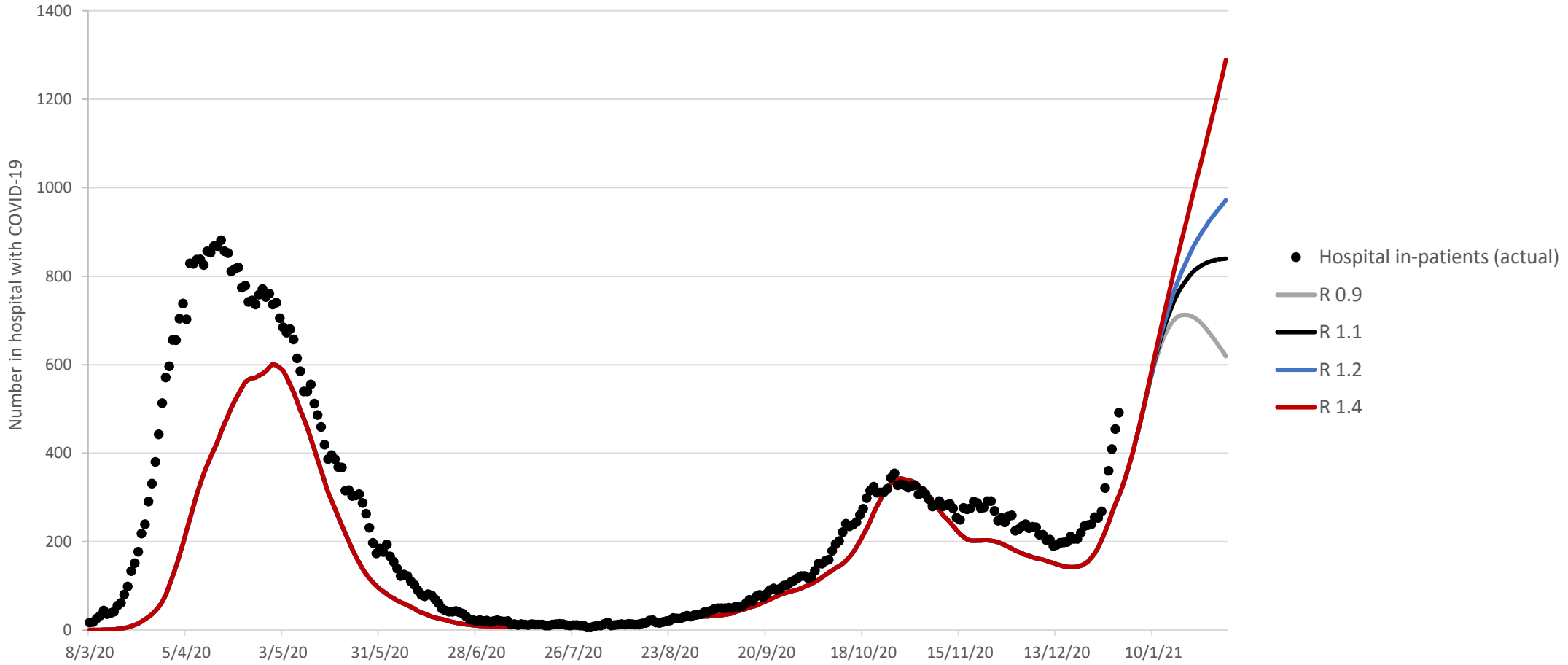

Model outputs and actual numbers in hospital with COVID-19. The model is calibrated using the age-stratified risk of hospitalisation and length of stay for the period July-November 2020. The model inputs are actual case numbers and age profile to 29 December 2020, and SEIR model projections thereafter; it is assumed the age profile from 29 December remains as it was for the 14 days up to 29 December.

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Model projections of hospital in-patient numbers

Model outputs for numbers of people in hospital with COVID-19. Model calibrated to 29 December 2020, and R then varies between 0.5 and 1.8. This model shows that even with suppression at R = 0.9 from 30 December, numbers in hospital will peak at 1000. If we fail to suppress transmission, numbers in hospital could reach 1000 early in January 2021, and rise thereafter depending on reproduction number.

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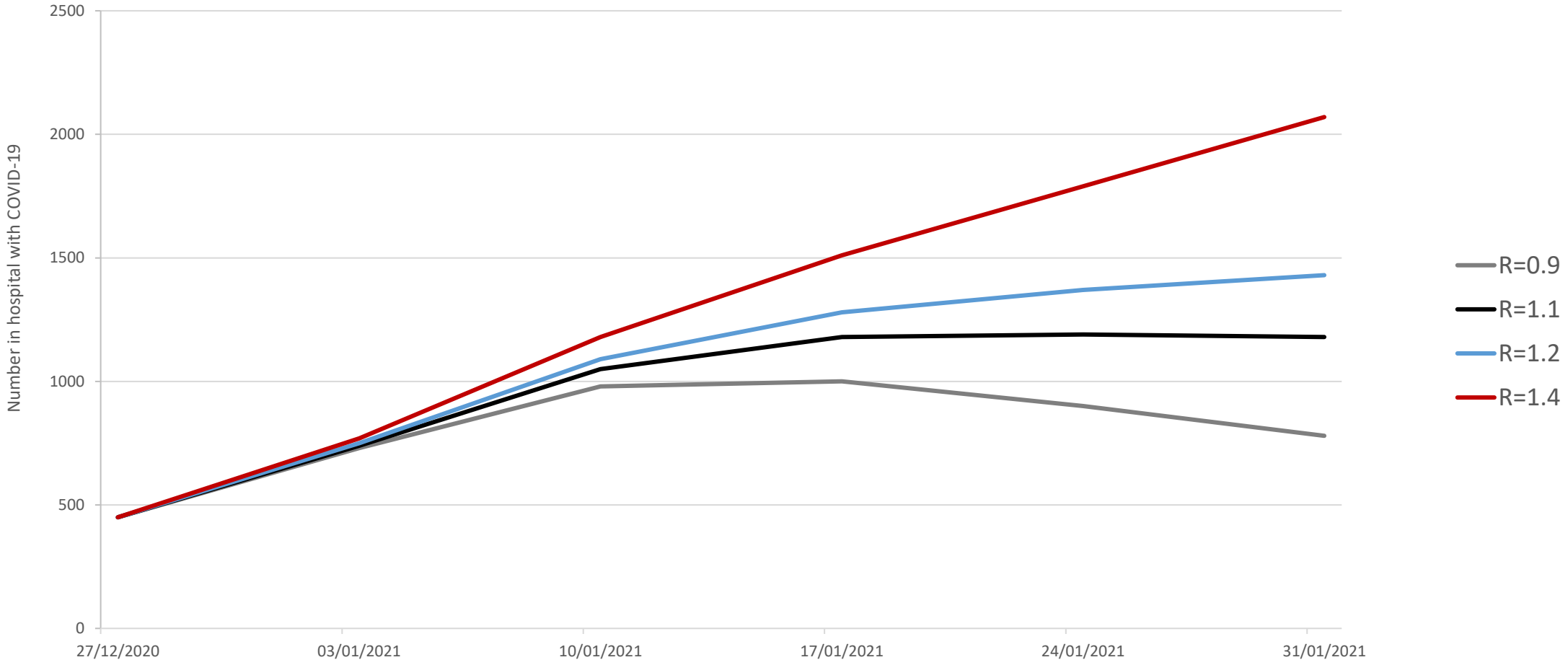

Model outputs and actual numbers in hospital with COVID-19. The model is calibrated using the CHUP model developed by ESRI; see IEMAG technical notes for details. The model is calibrated to 29 December 2020, and R varies from 0.5 to 1.8 thereafter.

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Situation analysis 31 December 2020

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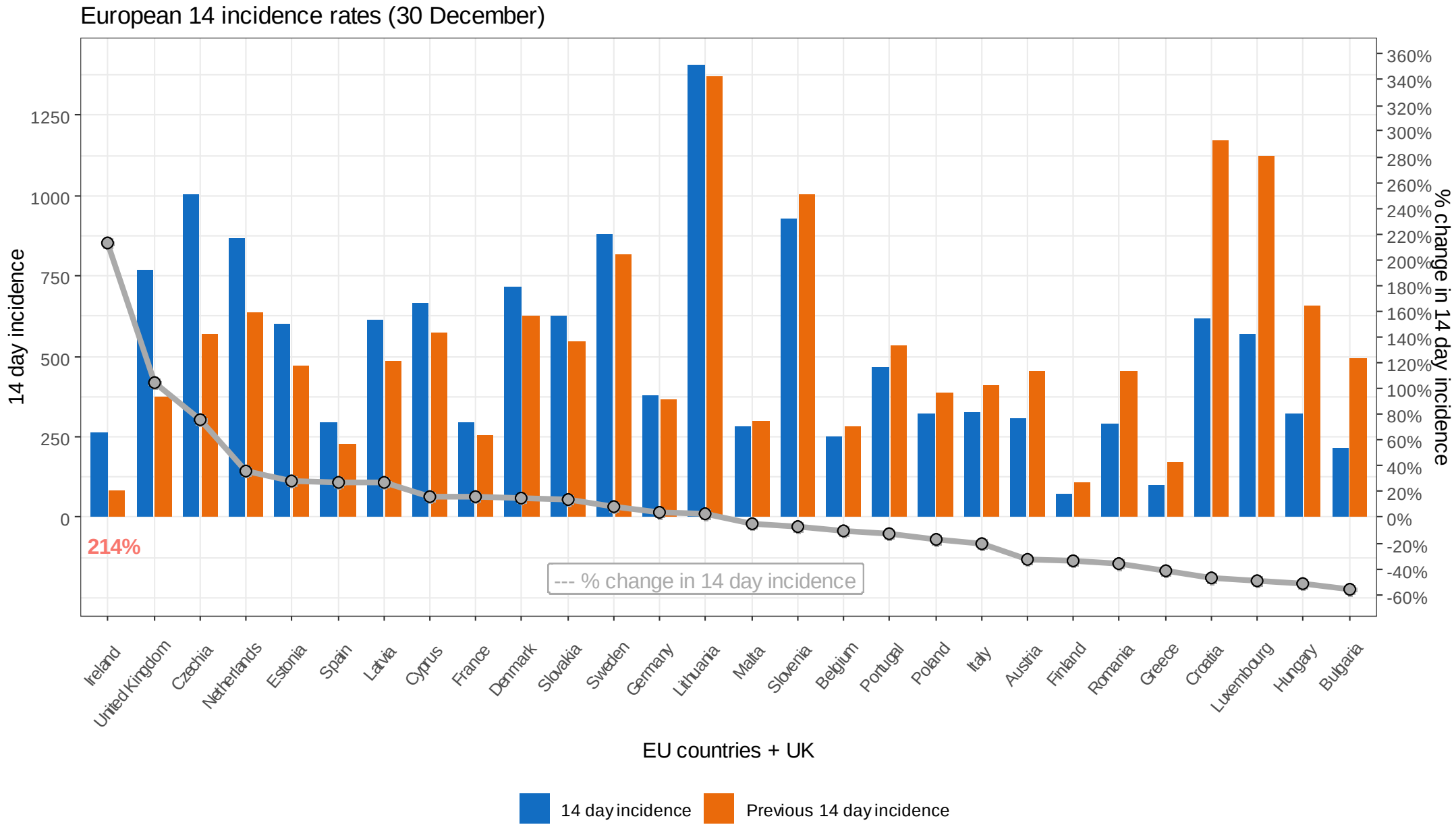
- The level of infection continues to increase rapidly
  - Cases (5-day average) 1279 cases per day; 14-day incidence 297 per 100,000
  - Incidence rising across all age groups, especially those aged 19-24
    - Incidence in those aged 18 and younger remains below population average
  - Growth rate estimated to be 7- 10% per day, and doubling time 7-10 days
  - Reproduction number very high – 1.6 – 1.8
  - Growth rates greater than those seen approaching the peak of the second wave
  - Actual incidence higher than reported due to reporting delays
  - Number of close contacts of confirmed cases increasing
- Numbers in hospital increasing rapidly, numbers in intensive care and deaths per day increasing.
- Case numbers will increase significantly for another 7-10 days before recent public health measures have their effect
- Numbers in hospital expected to reach at least 700-1000 in coming weeks
- We must suppress transmission to protect each other from serious illness, and to protect our health services and healthcare workers
- Stay home and carefully observe public health guidance and restrictions
  - We need society-wide support for and adherence to the current public health message to suppress disease



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- As of 16th Dec, this daily data is now sourced from Our World In Data (OWID) instead of ECDC as they have switched to weekly reporting (Thursday evenings).
- OWID source their confirmed cases and deaths data from the COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU). https://github.com/owid/covid-19-data/tree/master/public/data